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MINING

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SAIEE

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Dear **watt**now Reader,

South Africa's mining sector holds global significance, with large reserves of Platinum Group Metals (PGMs), manganese, diamonds, coal, and gold. This makes it a crucial component of the country's economy and exports. Despite facing challenges such as declining gold production and job losses, the sector remains vital for employment, supporting millions of people through its direct and indirect effects.

In our first feature article, "Can Battery Energy Storage Systems Help Power the Future of Mining in Africa?", we explore how many countries are intensifying efforts to modernise and extend their mining value chains. By leveraging targeted investments in infrastructure, energy, and technology, these countries aim to drive industrial growth and achieve long-term sustainable development. You can read more about this on page 32.

On page 36, we discuss "South Africa's Critical Minerals Strategy." The Cabinet approved the Critical Minerals and Metals Strategy in May 2025, marking a decisive step toward shaping the nation's economic and industrial future. As stated by the Minister of Mineral Resources, the Strategy is a call to action for the government, businesses, and communities to collaborate in unlocking the country's mineral potential.

The article "How Critical Energy Minerals Could Be Africa's Catalyst for Sustainable Development," on page 40, addresses how Africa's economic landscape has been significantly influenced by the mining sector, which continues to be a substantial employer and a key contributor to the GDP and trade balances of African nations.

The 74th Bernard Price Memorial Lecture, in collaboration with the University of the Witwatersrand (Wits), is scheduled for September 18, 2025. Click here to read more and RSVP by September 12 to Gerda Geyer.

The October issue will focus on Cybersecurity, and the deadline for contributions is September 15. Please send your submissions to minx@saiee.org.za.

Herewith the September issue - enjoy the read!

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Veer Ramnarain
2025/6 SAIEE President

During August, we celebrate Women's Month in the country. The South African Institute of Electrical Engineers (SAIEE) pays tribute to all females who have contributed to engineering in the country. As an institute that is continually striving to address the gender imbalance in this historically male-dominated profession, we recognise all the female SAIEE members and those who have served in leadership positions, and are active in Council.

E: president@saiee.org.za

Empowering Women in Engineering

- Celebrating Collaboration and Growth

In August, we had the honour of hosting the Deputy Minister of Electricity and Energy, Samantha Graham-Maré, in a SAIEE Smart Cities Chapter webinar titled "Enhancing Accessibility and Inclusivity in Smart Cities", at which she delivered the keynote address. Her address focused on the conscious design of cities to be inclusive of females and people with disabilities. Further, committees must not just accommodate but also empower those who are vulnerable. Let us, as electrical engineers, also embrace this message when we design systems, so that we become intentional, not just accommodating, but also empowering.

The collaborative efforts between tertiary institutions and SAIEE reached a significant milestone when, at a historic event, the Academic Leader for the Discipline of Electrical, Electronic and Computer Engineering (EECE) at the University of KwaZulu-Natal (UKZN), Professor Tom Walingo, handed over the keys to an office/boardroom to the SAIEE KZN Centre. This further reinforces the vision for the current presidential term by increasing the relevance of the institute, as our members now have a home at UKZN, from where they can contribute to the development of students at the university. All other centres are encouraged to build similar relationships with their local universities.

August has been a significant month in terms of building on our theme of collaboration to increase the value we add to our members by joining hands with like-minded institutions. To this end, we had signed two significant Memoranda of Understanding (MOUs) during the month. The first was signed with the South African Institute of Architects (SAIA). As Presidents of the respective institutions, we had agreed to collaborate on matters of mutual interest, such as training, research, publications, and events, to advance mutual interest.

The next significant MOU was signed with the South Africa section of the Institute of Electrical and Electronics Engineers (IEEE). This MOU serves to benefit our members by creating an opportunity to enter into joint projects, events, and products such as conferences, forums, publications, history, standards, educational materials, awards, etc. The joint activities are devoted to preserving and sustaining the environment, teaching math and science to children, improving technology awareness in the general public, and improving the personal and professional lives of our members.

During the month, the Presidential Invitation lecture was held at the University of Johannesburg. As President, I had invited Dr Nad Moodley from Eskom to deliver his address on 'Managing assets in a constrained and rapidly evolving environment from a Peaking Generation perspective.' Judging from the attendance and the number of questions asked, it was evident that this topic was of interest to a broad audience. I must appreciate the willingness of Dr Moodley to share his substantial experience with us, especially the concept of Resilience Engineering, which I had not previously heard of, but now appreciate the benefits of such an approach.

Resilience Engineering is an approach to withstanding and minimising the impact of disruptions caused by an external event, as well as the ability of the system to maintain its performance after a disruption. We must appreciate the presence of Dean Professor Mashao for attending the event and being an excellent host.

With confidence, as an institute, we are growing our members and are creating opportunities for them to contribute to the development of South Africa. wn

Veer N. RAMNARAIN – Pr Eng
2025 SAIEE PRESIDENT
BSc Electrical Eng, GCC, Dip EBM, MBA, MFMP

SAIEE Business Breakfast

Leanetse Matutoane, SAIEE CEO

The Old Mutual Team with SAIEE Executives

The SAIEE hosted a business breakfast on August 7th in collaboration with Old Mutual, focusing on Financial Security and Risk Management for SAIEE members, SAIEE Corporate Forum Members, and industry decision-makers.

Mr Johan Els, Group Chief Economist Old Mutual

Pascal Motsoasele and Leanetse Matutoane, SAIEE

The event took place at SAIEE House in Johannesburg, featuring several guest speakers. The first speaker, Mr. Rudie Joubert, an engineer and passionate cyclist, shared his motivational journey. After losing a leg, he didn't slow down; instead, he persevered with the help of Old Mutual Financial Services.

The second guest speaker, Mr. Johan Els, was appointed Group Chief Economist at Old Mutual Ltd in 2023. He oversees macroeconomic research, concentrating on global economies that impact South Africa, particularly those of the USA, Europe, and China. His presentation revealed that the South African economy is not as dire as the media often portrays.

The third guest speaker, Mr. Monde Mangesana, is an Employee Benefits Consultant at Old Mutual. Recognised for his analytical approach, strong communication skills, transparent problem-solving abilities, and passion for investments, he discussed the key offerings that Old Mutual Financial Services provides to corporates at no cost.

We encourage anyone interested in joining the SAIEE Financial Services Chapter to send an email to financialchapter@saiee.org.za. We welcome you to join us! wn

SAIEE FINANCIAL SERVICES CHAPTER

SAIEE KZN Centre making strides

ENGINEERS IN ACTION: SAIEE KZN CENTRE'S FIRST PADEL SPORTS DAY

On 6th August, the SAIEE KZN Centre hosted its first-ever Sports Day, and it was an immense success!

Despite the weather, our engineers brought outstanding energy, sportsmanship, and team spirit. From competitive rallies to shared laughter, it was proof that rain can't dampen our passion for connection and fun. A huge thank you to our sponsor Conlog for making this event possible.

Shoutout to our SAIEE KZN Centre Events Team for making it all happen – your dedication turned an idea into a winning tradition in the making.

If your company would like to sponsor or get involved in our upcoming events, email us at kznc@saiee.org.za. Let's keep building connections – both professionally and socially! wn

MANDELA DAY 2025 | IN THE SPIRIT OF UBUNTU

This Mandela Day, the SAIEE KZN Centre proudly joined hands with eThekwini Municipality to bring warmth, hope, and joy to the children and caregivers at the Mother of Peace Children's Home.

In honour of Madiba's legacy, our members stood in solidarity with a vibrant network of public and private stakeholders to contribute to a meaningful outreach. From essential supplies and nutritious meals to fun games, books, and a burst of music and colour – the day was filled with compassion, connection, and community.

SAIEE KZN Centre is especially proud to support initiatives that go beyond engineering – where technical excellence meets social impact. Our participation is a reminder that engineers not only power infrastructure – we power humanity. wn

2025 SAIEE President's Invitation Lecture

From left: Dr Nad Moodley, 2025 President's Invitation Lecturer, and Veer Ramnarain, 2025 SAIEE President.

Prof Daniel Mashao, Dean of the Faculty of Engineering and the Built Environment, UJ

Dr Nad Moodley receiving a gift from Prudence Madiba, SAIEE Deputy President.

On August 13th, the South African Institute of Electrical Engineers (SAIEE), in collaboration with the University of Johannesburg, held its annual President's Invitation Lecture.

This year, Dr. Nad Moodley, a Professional and Certified Engineer from Eskom, presented the lecture. He currently serves as the Engineering Change Authority for ten Eskom power stations, where he is responsible for making critical operational decisions and implementing emergency modifications. His expertise encompasses engineering, asset management, project and program execution, plant reliability, and the development of data-driven performance improvement strategies. Dr. Moodley is known for his skill in integrating people, processes, and technology to drive sustainable performance and resilience in complex, resource-constrained environments.

Dr. Moodley's presentation focused on "Managing Assets in a Constrained and Rapidly Evolving Environment – A Peaking Generation Perspective." He addressed the significant transformation occurring within South Africa's power system. As the country moves beyond the immediate crisis of load shedding and faces growing pressure to adopt renewable energy sources, maintaining grid stability and resilience has become more crucial than ever. In this dynamic and rapidly changing landscape, while the fundamental principles of asset management remain relevant, they must also evolve to remain effective.

The lecture examined the strategic and operational challenges involved in managing Peaking Generation assets—power stations that support the grid during periods of high demand—especially in an environment characterised by limited resources, ageing infrastructure, and shifting energy priorities.

Click here to view the recording of the 2025 President's Invitation Lecture.

ACTOM's Women's Empowerment Programme Boosts Economic Growth in South Africa

In celebration of Women's Month, ACTOM emphasises the importance of gender-inclusive economies through its Women's Empowerment Programme, launched in 2022. This initiative aims to foster economic independence for women and contribute to South Africa's growth.

EMPOWERING YOUNG WOMEN THROUGH SKILLS AND ENTREPRENEURSHIP

Focused on disadvantaged communities near ACTOM's Germiston site, the programme provides skills training in trades like sewing, plumbing, and carpentry, along with entrepreneurship training. It addresses high unemployment by enabling participants to start and manage their own businesses. The initial cohort includes twenty women poised to make significant economic contributions.

"Investing in skills training is the most sustainable form of socio-economic development," says Sylvester Makamu, ACTOM's Group Executive Director. "It builds lifelong tools for empowerment."

IZINTOMBI ZODWA TRADING: A SUCCESS STORY

Izintombi Zodwa Trading, founded by Nozuko Mtsila, Nteokase Mosima, and Khonzeka Mdleleni, exemplifies the programme's impact. Supported by ACTOM, this sewing business supplies corporate and protective clothing, showcasing its growth towards economic independence. Their milestone achievement includes producing branded t-shirts for a large marathon event.

"This programme ignites confidence and develops future entrepreneurs," Makamu emphasises, noting the program's broader impact.

A CALL TO ACTION FOR CORPORATES

ACTOM's initiative has successfully moved from socio-economic to enterprise and supplier development. The company urges other corporates to champion gender equality and economic inclusion.

By investing in their communities, companies can foster sustainable growth. ACTOM's model highlights how targeted investments in women's empowerment yield significant economic benefits, creating lasting partnerships that serve both business and community.

John Thompson and BECS partner to deliver profitable biomass energy solutions for Africa

From left: Nicholas Tatrallyay, Managing Director at BECS and Jaco Grobbelaar, CEO of John Thompson Industrial.

John Thompson, a division of ACTOM (Pty) Ltd and South Africa's leading provider of industrial energy solutions, has announced a strategic partnership with Berkeley Energy Corporate Solutions (BECS), a specialist developer and supplier of biomass energy projects.

Together, the companies aim to accelerate the deployment of reliable, renewable steam solutions to industrial customers in South Africa and across Africa. This collaboration brings together John Thompson's deep engineering expertise and manufacturing capability with BECS' innovative approach to sourcing, securing, and supplying sustainable biomass fuel.

This alliance is a powerful partnership geared towards helping businesses decarbonise their operations, reduce reliance on fossil fuels, and meet growing demands for cost-effective, renewable energy.

As a non-exclusive partnership, BECS will continue pursuing other energy projects independently, while John Thompson will engage BECS in suitable projects for customers that require funding, development support, and scalable energy-as-a-service delivery.

DECARBONISING WITH CONFIDENCE

With industrial sectors under growing pressure to transition to low-carbon operations, this partnership is perfectly timed. The industrial sector is a major energy consumer and carbon emitter, particularly in industries that rely on high-temperature process heat such as food and beverage, pulp and paper, chemicals, textiles, and mining.

Switching to cleaner fuels is more than just a regulatory imperative; it is a business necessity, which is where the John Thompson-BECS model comes in. The partnership offers a low-carbon steam solution based on sustainable biomass feedstock. Under a long-term heat offtake agreement, the system is designed, funded, built, and operated on behalf of the client, who simply pays for the steam consumed.

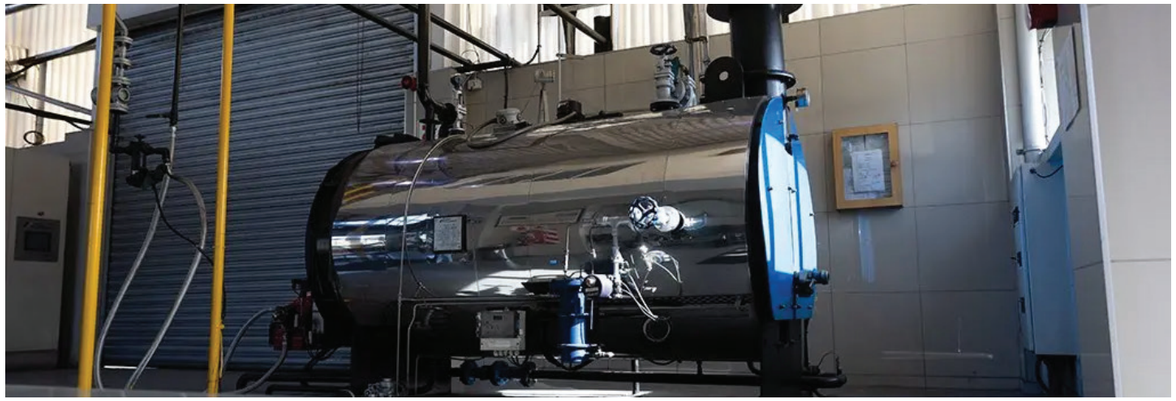
"This approach helps businesses overcome the two biggest barriers to decarbonisation: the high upfront cost and technical complexity of energy system upgrades," said Jaco Grobbelaar, Industrial CEO at John Thompson. "Our clients do not need to become energy experts or infrastructure owners, because we take on the risk, the capex, and the performance accountability."

A UNIQUE APPROACH TO BIOMASS SUPPLY

What sets this partnership apart is BECS' strategic approach to biomass sourcing. BECS goes beyond simple fuel supply, working directly with large-scale agricultural and forestry producers and processors to secure long-term feedstock contracts that are sustainable, traceable, and cost-effective. This ensures a reliable fuel supply chain tailored to the client's specific needs, something many energy developers cannot offer.

"In a market where supply risks and quality inconsistencies can stall biomass adoption, we provide stability," explains Jonathan Probert, Business Development Manager for Southern Africa at BECS. "We align our supply chains to specific project locations and customer volumes, ensuring security of supply while maintaining competitive pricing."

Unlike other players in the African energy space, BECS is focused solely on renewable energy and energy efficiency solutions, including using sustainable biomass to generate steam and/or power. This singular commitment differentiates them from other providers in the market who typically generate energy from predominately fossil fuels.



"This partnership enables us to deliver bankable, long-term energy solutions that meet the real-world needs of industrial clients," says Nicholas Tatrallyay, Managing Director at BECS. "Together with John Thompson, we are addressing the cost, complexity, and carbon intensity of steam generation, helping businesses achieve sustainability and growth."

EXPANDING ACROSS AFRICA

Initial deployments are already underway in South Africa, with the model now being introduced to industrial clients in Zambia, Kenya, Mozambique, and Ghana, where energy resilience and sustainability are key enablers of growth. The solution is particularly attractive to companies looking to reduce carbon emissions and operational risk while securing predictable long-term energy pricing.

The partnership is already progressing on a range of biomass boiler projects across South Africa, with potential expansion into other African markets where John Thompson has an existing footprint. Each solution is designed to be scalable, bankable, and tailored to the operational realities of industrial users.

By integrating BECS' biomass fuel solutions into John Thompson's proven boiler systems and operational models, clients can expect a seamless transition to renewable energy without sacrificing performance or uptime.

DESIGNED FOR DELIVERY AND LONG-TERM IMPACT

"This is not just about replacing a fuel source. It is about delivering an end-to-end renewable energy solution that works," concludes Grobbelaar. "Together with BECS, we are giving African industry the tools to achieve sustainability, profitability, and resilience." wn

Seriti Resources and Nafasi Water partner to deliver sustainable water treatment solutions

Seriti Resources, in partnership with Nafasi Water Technologies, is launching a significant project to finance, build and operate a water treatment project at the Arnot Closed Colliery near Middelburg, Mpumalanga. This initiative reflects Seriti's commitment to responsible water management, environmental stewardship and compliance with regulatory requirements.

The Olifants River catchment is one of South Africa's most strategically essential water systems, supporting communities, agriculture, industry and biodiversity across multiple provinces.

By discharging clean, treated water into the environment, this project will help restore downstream water quality, enhance water security for users, and contribute to the ecological health of the catchment area, ultimately ensuring more sustainable use of this critical shared resource.

Mining activities at Arnot ceased in 1992, yet the site continues to produce mine-impacted water. Existing on-site measures such as evaporation and pumping are no longer sustainable or cost-effective, and storage capacity has been exhausted.

The new facility will treat the water to the required quality standards and discharge clean, compliant water into Bosmanspruit, part of the Olifants River catchment, in line with Seriti's Water Use License.

Delivered through a Build-Own-Operate-Maintain (BOOM) model, the project encompasses the complete lifecycle from design and construction to long-term operation and eventual decommissioning. All waste will be responsibly disposed of at approved off-site facilities.

Mike Teke, Group Chief Executive Officer of Seriti Resources, said: "At Seriti Resources, we recognise that our responsibility as a mining company extends far beyond the life of our operations. The Arnot water treatment project is a clear demonstration of how we can honour our mine closure obligations, while making a meaningful contribution to the environment and communities around us.

Clean and secure water systems are vital for South Africa's future. Through this partnership with Nafasi Water, we are taking tangible steps to protect one of the country's most critical catchment areas. This is about ensuring that the legacy of Arnot Colliery is about powering the nation, and about safeguarding natural resources for generations to come."

Suzie Nkambule, Chief Executive Officer of Nafasi Water, commented: "Through this collaboration, we can leverage our specialist expertise in mine water treatment to deliver a solution that brings both environmental and community benefits. By applying innovative treatment processes and maintaining the highest operational standards, we can ensure that clean, compliant water is returned to the environment, supporting the restoration and protection of this vital catchment area."

This long-term solution will address mine closure obligations, reduce environmental risk and help protect critical local water systems within the Olifants River catchment. The partnership between Seriti Resources and NafasiWater demonstrates the power of collaboration in delivering sustainable environmental outcomes. wn

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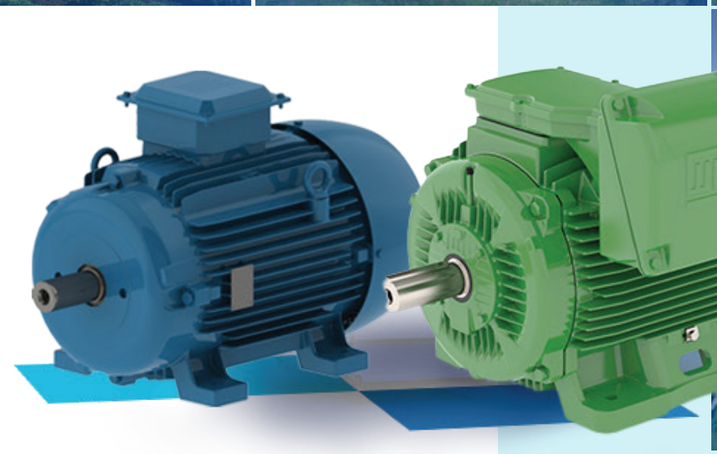

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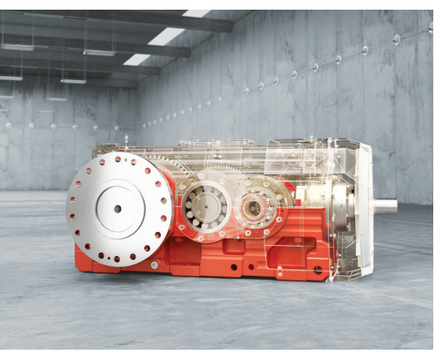
Driving efficiency and sustainability

Building Skills and Sharing Knowledge Key to SEW-EURODRIVE's Growth in Africa



Operating successfully in Africa demands far more than the delivery of products or technology - it requires a deep understanding of local conditions, proactive skills development and sustained collaboration across borders.

SEW-EURODRIVE's recent African regional workshop in Johannesburg brought together teams from across the continent for hands-on product training and cross-border knowledge sharing.

While industry sectors such as mining, food and beverage, water treatment and manufacturing share some common operational requirements, each African country presents its own distinct set of challenges shaped by infrastructure limitations, environmental conditions and regulatory variations.

As a leading provider of drive and automation solutions across the continent, SEW-EURODRIVE recognises that local insight and on-the-ground capability are critical to delivering effective, sustainable results. The company continues to invest in people development and technical training within its network of African subsidiaries and partners, supporting the long-term growth of its customers and the broader industrial ecosystem.

A recent regional workshop hosted at SEW-EURODRIVE's Johannesburg facility brought together team members from several African countries for intensive product training and inter-regional knowledge exchange. The focus extended across the company's full suite of advanced technologies, including its modular X.e-series industrial gear units, energy-efficient IE3 electric motors, decentralised MOVIGEAR® mechatronic drives and the sophisticated MOVI-C® automation platform.

"Workshops like this are invaluable because they not only upskill our people but also help us connect the dots between what we do in different regions," says Teboho Moloi, Business Development Executive: Africa at SEW-EURODRIVE South Africa. "Our teams face very different realities depending on where they are operating, from remote mining operations in Zambia and the DRC to agro-processing plants in Kenya and Ghana. By sharing technical experiences across these sectors, we enhance our ability to apply the right solution for each unique application."

Moloi highlights the value of knowledge-sharing in building a robust reference base across industries. "In the sugar sector, for instance, we've successfully deployed helical and bevel geared motors on conveyors and mill drives, while in water treatment our compact and corrosion-resistant solutions help ensure uptime in aggressive environments. These learnings are not only relevant to similar applications elsewhere in Africa, but they also allow us to anticipate challenges and fast-track problem-solving."

Teboho Moloi, Business Development Executive: Africa at SEW-EURODRIVE South Africa.

SEW-EURODRIVE's technical training initiatives ensure that teams across Africa are equipped to deploy advanced technologies in diverse industry environments.

By equipping its people with the latest product expertise and encouraging collaboration across borders, SEW-EURODRIVE is strengthening its ability to serve Africa's evolving industrial and mining landscape. The company's commitment to developing regional capability ensures it remains responsive, reliable and aligned with its customers' strategic needs.

"Ultimately, our investment in people and technology is what sets us apart," says Moloi. "It is how we grow with our customers - and grow Africa's industries at the same time." wn

Trafo Power Solutions Strengthens Presence in African Mining

Two 160 kVA pole-mounted transformers, both rated at 22 kV to 415 V to match the mine's voltage requirements, were part of the scope.

Seven of the transformers were skid-mounted transformers, ensuring ease of mobility across the expansive mining site.

Providing tailored electrical power solutions to the African market has positioned Trafo Power Solutions as a key player in the region. The company's success is rooted in its deep expertise, extensive experience and thorough understanding of the needs of mining operations across the continent.

This has enabled Trafo Power Solutions to meet the unique challenges associated with electrical power supply in these harsh and demanding environments.

One of the company's latest projects highlights its ability to provide specialised transformer solutions suited to the rigorous conditions of mining applications. Trafo Power Solutions recently supplied nine transformers to an electrical contractor for installation at a mineral sands operation in Mozambique.

This delivery included seven 800 kVA transformers designed for skid mounting, ensuring ease of mobility across the expansive mining site. The remaining two units, rated at 160 kVA, will be pole-mounted. All transformers in this order are rated at 22 kV to 415 V, aligning with the site's specific voltage requirements.

David Claassen, Managing Director of Trafo Power Solutions, explains that this latest order follows a previous successful supply of four dry-type transformers directly to the mining operation. The earlier batch included 3150 kVA transformers, also rated at 22 kV to 415 V, and installed within IP23 enclosures. These transformers were equipped with the necessary control and protection equipment to ensure robust performance in the highly corrosive operating environment of the mineral sands mine.

"The mineral sands mining environment is particularly harsh, with high humidity and salinity levels that can accelerate corrosion. Our transformers are specifically designed to withstand these conditions, ensuring longevity and reliability in such an aggressive setting," says Claassen.

A key factor in this repeat business was the mine's confidence in the performance of the previously supplied transformers. "When the need arose for additional transformers, the customer specifically requested Trafo Power Solutions, which underscores our commitment to delivering quality solutions that meet the exact needs of mining operations," Claassen adds.

One of the critical design considerations for these transformers was minimising electrical losses while ensuring the ability to handle large non-linear loads from the mine's Variable Speed Drives (VSDs). These transformers were engineered according to SANS 780 Edition 5.1 standards to achieve the lowest possible losses. Additionally, due to the site's known voltage supply instability, the transformers were designed to withstand fluctuations while maintaining consistent and reliable power.

Aside from the technical specifications, the project also posed significant logistical challenges. The remote location of the mine required careful planning to ensure the seamless transportation and installation of the transformers. "Logistics is always a key factor when supplying equipment to mining operations in remote areas. We worked closely with our partners to ensure a smooth delivery process despite the challenges," says Claassen.

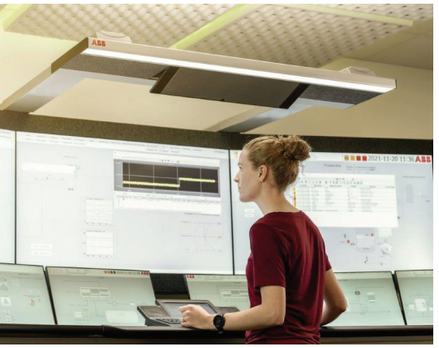
The transformers have been purpose-built to meet the demanding operational conditions of mineral sands mining.

Further reinforcing its relationship with the electrical contractor and the mine, Trafo Power Solutions has secured an additional order for 18 transformers, which are scheduled for delivery by the third quarter this year. This ongoing partnership underscores the company's reputation as a trusted supplier of high-quality, purpose-built transformers tailored for mining applications in Africa.

As Trafo Power Solutions continues to expand its footprint across the continent, its commitment to delivering reliable, durable and efficient electrical power solutions remains at the forefront of its strategy. With a strong focus on engineering excellence and a deep understanding of mining conditions, the company is well-positioned to support the sector's evolving power infrastructure needs. wn

The transformers have been designed to handle large non-linear loads from the mine's Variable Speed Drives.

Unlocking mining efficiency with advanced processing control



In an industry where minor improvements can yield significant cost savings and productivity gains, mining companies are increasingly turning to automation and data-driven optimisation to stay competitive. ABB's Advanced Process Control (APC) system, powered by its Expert Optimizer platform, is emerging as a key enabler of smarter, more efficient mining operations.

"Advanced Process Control systems are designed to sit above the plant's basic control layer," explains **Kabeer Sewpersad**, Sales Manager – Digital Solutions, ABB Process Automation, Process Industries. "They act as a layer of intelligence, making small, precise adjustments that optimise performance without disrupting operations."

WHAT IS ADVANCED PROCESS CONTROL?

In a typical mining setup, day-to-day operations are managed by a Distributed Control System (DCS) or SCADA system, also known as Level 2 systems. ABB's APC solution, Expert Optimizer, operates as a Level 3 control system, integrating seamlessly with ABB's flagship 800xA DCS platform or with third-party systems.

"Expert Optimizer leverages technologies such as Model Predictive Control (MPC) and artificial neural networks to analyse and refine key process parameters in real-time," notes Sewpersad. "It does not make large-scale changes, which is still the domain of the DCS. What it does is introduce subtle, incremental refinements that drive long-term benefits."

SEAMLESS INTEGRATION AND MINIMAL DISRUPTION

A standout feature of ABB's APC solution is its non-invasive deployment. "If the customer is already using our 800xA DCS, we simply add Expert Optimizer as an additional server. It integrates inherently with 800xA by design," says Sewpersad.

Even when a client uses a third-party DCS, Expert Optimizer remains highly compatible. "It is flexible and system-agnostic, allowing us to implement APC as a standalone layer with minimal disruption," he adds.

This flexibility is especially valuable in mining, where unplanned downtime can result in significant losses. Since Expert Optimizer operates independently of direct control layers, its deployment does not interfere with production.

FINGERPRINT ASSESSMENTS FOR CUSTOMISED IMPLEMENTATION

There is no one-size-fits-all approach to APC deployment. ABB begins each engagement with a Fingerprint Assessment or a tailored questionnaire to understand the existing plant setup, automation readiness for APC, and potential areas of improvement.

"We send an engineer on site for a week or two to gather historical data, interview operators, and assess whether the plant has the necessary infrastructure, like variable speed drives, for APC to be effective," says Sewpersad. "This ensures we are proposing solutions that deliver real value."

With more than 25 years of APC experience, ABB has built a library of industry-specific base models that can be quickly adapted for individual clients. "For example, we already have templates for grinding plants. Customisation then becomes a matter of finetuning rather than starting from scratch," he adds.

REAL, MEASURABLE BENEFITS FOR MINING

In the mining sector, the benefits of APC are particularly striking in comminution and grinding processes. Here, APC can deliver up to a 2.5% increase in throughput, 4.3% improvement in particle size distribution, 10.9% reduction in specific energy consumption, reduced grinding media consumption, and improved downstream stability and reduced variability.

"When you tighten control over the grinding process, you are also stabilising what flows into the flotation, thickening, and smelting stages. That kind of upstream optimisation has a cascading effect across the entire value chain," says Sewpersad.

Across multiple stages, cumulative improvements can be substantial: up to 20% improvement in milling efficiency, 15% reduction in losses in cleaner circuits, 4% gains in thickening performance, and 3% enhancement in smelter efficiency.

And because Expert Optimizer monitors performance through built-in KPI tracking, clients can see the impact in real time. "Our platform enables customers to measure how well they are using the APC system, track savings shift by shift and compare actual outcomes with projected gains like energy savings or reduced reagent use," explains Sewpersad.

A STRATEGIC, PHASED APPROACH

ABB encourages mining clients to implement APC in stages. "Start with one process, realise the return on investment, and then use that success to fund further improvements," advises Sewpersad. "This phased rollout not only reduces risk but also builds long-term trust and collaboration between ABB and the client."

With its proven Expert Optimizer platform, seamless integration into the 800xA DCS, and a clear path to measurable operational gains, ABB is helping mining clients unlock a new level of performance, one process at a time. "You will be surprised how even a 1% or 5% change can result in major efficiency gains over time," concludes Sewpersad. wn

Building Economies by Building Solar Panels

- ARTSOLAR'S CONTRIBUTION TO SOUTH AFRICA'S FUTURE

South Africa's greatest asset is its people, who are resilient, talented, and full of potential. At ARTsolar, we believe that building solar panels is about more than producing clean energy; it is about building an economy, empowering young South Africans, and securing our nation's future.

Since its incorporation, ARTsolar has manufactured over 220,000 verified and audited Tier 1 solar panels under licence, supplying directly into the country's Independent Power Producer (IPP) programme. This long-standing track record proves that a South African-owned company can deliver world-class technology at utility scale while ensuring that economic value is retained within the country.

EMPOWERING YOUTH, CREATING JOBS

The impact of ARTsolar's operations is most visible in the lives of young South Africans. During Bid Window 3, 220 jobs were created, and over 300 were created during RMIPPPP, with many of these positions filled by previously unemployed youth.

Each role is more than a job; it provides training, mentorship, and knowledge transfer from global partners, enabling South Africans to master renewable energy technology and build long-term careers. In this way, ARTsolar is not only delivering solar panels, but also shaping a generation capable of advancing South Africa's clean energy future.

PUBLIC PROCUREMENT VS PRIVATE MARKETS

ARTsolar's core mission is to manufacture at a utility scale for public procurement projects, where localisation requirements ensure that renewable energy investments directly benefit South Africans through job creation, skills development, and industrial growth. By contrast, the private market is often highly price-sensitive and largely brand-agnostic, with customers focusing on affordability and the speed of delivery. To address this reality, ARTsolar ensures that all panels, whether manufactured locally or sourced internationally, are tested and certified in South Africa.

This process not only provides full local warranties but also generates additional local value creation, as testing, quality assurance, and after-sales service are all delivered within the country.

WORLD-CLASS STANDARDS AND NATIONAL PRIDE

In addition to operating a world-class, Clean Energy Associates (CEA)certified facility approved by various Tier 1 manufacturers, ARTsolar is home to the only Chinese institute-approved PV testing facility in South Africa.

Our laboratory is equipped with a G-Solar +AAA grade Sunsimulator calibrated by the Chinese state-owned Fujian Metrology Institute, ensuring that both locally manufactured and imported panels meet the highest global standards, validated under South African conditions. By carrying out this certification locally, ARTsolar keeps critical technical expertise, accountability, and economic benefit firmly within South Africa.

Through its partnership with JA Solar, ARTsolar proudly delivered the first DeepBlue 4.0 Pro modules ever manufactured in Africa. This milestone highlights the company's capability to bring cutting-edge renewable energy technology to the continent.

ALIGNED WITH NATIONAL POLICY

The Integrated Resource Plan 2030 (IRP 2030) sets ambitious targets for multi-gigawatt solar PV deployment, while the South African Renewable Energy Masterplan (SAREM), approved by Cabinet in 2025, prioritises local manufacturing, job creation, and industrialisation. These frameworks provide both demand certainty and policy backing for ARTsolar's growth, cementing its role as a cornerstone of South Africa's renewable energy transition.

A SHARED RESPONSIBILITY

ARTsolar is committed to using its years of experience and manufacturing excellence to strengthen South Africa's renewable energy sector, drive inclusive growth, and foster long-term innovation.

Chairman Eshu Seevnarayan concludes: "Every panel we manufacture carries more than silicon and glass; it carries the pride and determination of South Africans.

Our young people are proving daily that they can meet world standards, and every job we create uplifts a family and a community. Supporting local manufacturing is not just business; it is a patriotic duty to power our country with our own hands and our own future."

Why Engineering Students should join the SAIEE

Engineering students in South Africa are highly encouraged to consider joining the South African Institute of Electrical Engineering (SAIEE). This prestigious organisation offers numerous benefits that significantly enhance their academic and professional development.

ABOUT THE SAIEE

Formed in 1909, the SAIEE has ±6000 members professionally engaged in various engineering activities, including academic research, manufacturing, electronics, telecommunications, measurement and control, mining, and power infrastructure services. Members make meaningful contributions to the quality of life in communities and the steady advancement of technology. Their efforts are acknowledged in many countries worldwide.

One key advantage of joining the SAIEE is access to a network of experienced professionals in the engineering field.

As members, engineering students have the opportunity to connect with industry experts who can provide valuable mentoring and career guidance. These connections can help students gain insights into the latest trends and developments in the industry, as well as potential job opportunities and internships.

Furthermore, SAIEE membership provides exclusive events, workshops, and seminars tailored to help engineering students enhance their skills and knowledge.

These events offer valuable opportunities for students to learn from experts in the field, collaborate with peers, and stay updated on the latest advancements in engineering.

The SAIEE Student membership is free from 1 December 2024, and with that, the SAIEE Student member (StM) receives the following benefits:

- **Jobs portal for WIL**
  SAIEE Student Members receive preferential placing for their Work Integrated Learnership (WIL) with our SAIEE Corporate Partners
- **Mentorship**
  The SAIEE has a cohort of mentors who are willing and eager to assist our student members with their studies and career guidance
- **Exclusive Networking Events**
  StMs attend all SAIEE events for free and are exposed to industry decision-makers
- **CPD training discounts**
  To maintain your continuous development, the StM receives significant CPD training discounts
- **Charge Reward Programme earnings**
  As a StM, when attending SAIEE events, you earn Charge Reward Points, which can be claimed against paying for training courses, etc.
- **Bursary programme**
  StMs receive preferential treatment when they apply for a SAIEE Bursary
- **Publication access**
  Student members have access to all SAIEE publications since its inception in 1909, which include the monthly online wattnow magazine and the peer-reviewed Africa Research Journal
- **Site visits**
  SAIEE Student members are invited to site visits free of charge, which is CPD accredited, where you can learn hands-on how manufacturing facilities operate
- **SAIEE Centres**
  SAIEE has nine centres nationwide, and we encourage students to get involved at their local SAIEE Centre and represent your student chapter on the Centre EXCO committee.

The South African Institute of Electrical Engineering is a valuable investment for students from all engineering disciplines and tertiary establishments who are serious about advancing their careers in engineering. To learn more about joining the SAIEE, click here. wn

Serving Since 1909

Formed in 1909, The South African Institute of Electrical Engineers sports ± 6000 engineering professionals.

Why Join Us

Our members are professionally engaged in various engineering activities, including academic research, manufacturing, electronics, telecommunications, measurement and control, mining, and power infra-structural services. Members make meaningful contributions to the quality of life in communities and the steady advancement of technology. Their efforts are acknowledged worldwide. Join us today and start making a difference!

Student Bursaries

Our bursaries are for candidates who have completed a first-year study for a degree or diploma in Electrical, Electronic or Computer Engineering at an accredited South African tertiary institution.

Skills Development

One of our core objectives is to harness and foster the growth of students to study Science, Technology, Engineering, and Mathematics (STEM) subjects.

Student Activities

Becoming involved in a Student Chapter and participating in meetings can teach a student member valuable business skills. SAIEE offers mentorship, coaching and vacation work.

Our Purpose

To enhance the practice of electrical engineering in South Africa and the stature of our members through knowledge, networking, influence, education and communication.

SAIEE

Contact Us

SAIEE House, 18A Gill Street, Observatory, JHB
011 487 3003
www.saiee.org.za

Bridging the Gap Between Engineering Education and Financial Literacy

UKZN SAIEE Members with the Standard Bank Team

A full house at UKZN as Standard Bank delivers an engaging Financial Literacy Talk to the engineering students.

On Wednesday, 6 August, the School of Electrical, Electronic & Computer Engineering at UKZN welcomed Standard Bank for an insightful and impactful engagement with our students.

SAIEE UKZN STUDENT CHAPTER

The session combined a Financial Literacy Talk with an introduction to Standard Bank Product Solutions, providing attendees with practical knowledge to manage their financial futures better. Beyond theory, the discussion addressed real-world financial decision-making, budgeting, and the importance of early financial planning - skills that are invaluable for young professionals entering competitive industries.

We extend our sincere appreciation to the Standard Bank team for not only sharing their expertise but also for their generosity in providing gifts, food, and refreshments, which added to the warm and interactive atmosphere of the day.

Events such as these serve as a critical bridge between academic learning and practical life skills, ensuring that our students are equipped to navigate both personal and professional challenges with confidence. By fostering such partnerships, we continue to create opportunities for holistic student development, preparing future engineers for success beyond the lecture hall. wn

IEEE SPEC 2025

APPLICATION FOR SCHOLARS OPEN

DECEMBER 1 - 4 | Wits University, JHB

SPEC

pels

IEEE

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

FOR STUDENTS

IEEE SPEC 2025 (the 10th Southern Power Electronics Conference) will take place in Johannesburg, South Africa, from December 1 to 4, 2025. SPEC 2025 offers a valuable opportunity for researchers, engineers, academics, and students worldwide to showcase the latest technological advances and applications in Power Electronics to the Southern Hemisphere.

The conference organising committee is delighted to announce scholarships for students attending the 2025 IEEE Southern Power Electronics Conference (IEEE SPEC 2025).

Scholarships are administered by the Conference Committee and cover the student registration fee for about 10 winning recipients.

Closing date for Applications: 23 Oct 2025.
Eligibility criteria for Scholarships:

- Be an IEEE PELS student or Young Professional Member.
- A paper (or papers) with you as a co-author is accepted for presentation at the IEEE SPEC 2025 conference.
- Complete the Scholarship Application Form.

Please submit the completed Scholarship Application Form and send it to:
s.b.tennakoon@staffs.ac.uk
before 23 October 2025.

IMPORTANT DATE

23 | OCTOBER 2025
Scholarship Application

CLICK HERE FOR MORE INFORMATION

IEEE SPEC 2025

RS South Africa and Qhubeka Empower Learners Through the Gift of Mobility

RS South Africa, in proud partnership with Qhubeka Charity through the Inqolobane Trust, is continuing to make a tangible difference in the lives of South African learners. Through its bicycle donation initiative, 354 bicycles have been distributed to date, empowering students to access education more easily by reducing the physical and economic barriers posed by long daily commutes.

As part of this year's rollout, bicycles have been delivered to high schools in various provinces, including Mawewe High School in Mpumalanga, Morare High School in Limpopo, and both Sewagodimo Technical and Commercial High School and Gabonewe Secondary School in North West.

These distributions targeted primarily Grade 9, 11 and 12 learners, whose schooling is critical to long-term academic success. The initiative recognises that for many learners, walking long distances to school consumes time and energy that should be dedicated to studying.

The latest handover took place at Langalibalele Secondary School in the Mogalakwena District, Limpopo, on 6 August 2025, where 27 bicycles were donated to Grade 12 learners. An additional distribution of 53 bicycles was scheduled for a school to be confirmed at a later date.

The initiative was inspired by RS South Africa's Managing Director, Brian Andrew, who rode a Qhubeka bicycle during the 97km Virgin Active 947 Ride Joburg in November 2022. His experience sparked the #Qhubeka1000 fundraising initiative, which laid the foundation for a partnership with Inqolobane Investment Trust, with Qhubeka as the nominated beneficiary.

Through this partnership, RS South Africa has continued to make a meaningful contribution to Qhubeka's bicycle distribution and mobility programmes, helping to expand access to reliable transport for learners in underserved communities.

Reflecting on the partnership, Brian Andrew, Managing Director of RS South Africa, explained, "This collaboration with Qhubeka is about more than just bicycles; it is about giving young South Africans a real chance to succeed. Mobility plays a crucial role in education, and by reducing the time and effort it takes to get to school, we are helping to unlock opportunities that can change lives. It is an honour for RS South Africa to play a part in this journey."

The principal of Langalibalele Secondary School, Mrs Kekana, noted, "Our learners are required to be at school early and often leave late in the afternoon. The long walk to and from school is exhausting, leaving them drained before lessons even begin. These bicycles will ease that burden and give them more time and energy to focus on their studies."

The principal of Morare Secondary School, Mr Moeketsi, also expressed his gratitude, saying, "We would like to acknowledge and appreciate the good gesture of donating bicycles to our learners.

The gesture goes a long way in alleviating transport problems to ferry learners to school. Also, it brings some form of entertainment and motivation after school, offering much-needed psychosocial support. Ordinarily, this has reduced late coming and absenteeism of learners in our school."

In South Africa, 8 million children walk to school every day, often travelling long, dangerous routes. Bicycles help reduce commute time, increase safety, and enable better attendance and performance in the classroom. Beyond education, bicycles offer a powerful tool against poverty. With 8 million children living below the food poverty line, families often spend up to 39% of their budgets on transport. A bicycle is an affordable and sustainable alternative, providing long-term economic relief.

"Qhubeka extends heartfelt thanks to RS South Africa for their generous donation and ongoing support.

At Qhubeka, we know that a bicycle is far more than just a way to get around; it is a tool for transformation.

In the schools and communities we serve, we have witnessed how access to bicycles leads to improved academic performance, higher pass rates, increased university admissions, and greater learner retention.

Thanks to partners like RS South Africa, we can help more children move forward faster, safer, and with renewed purpose.

Together, we are changing lives, one bicycle at a time," concluded Anthony Fitzhenry, the Founder of Qhubeka.

To support Qhubeka's mission and help more learners move forward, visit www.qhubeka.org. wn

Universities in South Africa

It is only through education that people are able to improve themselves. One of the most important factors for escaping from poverty is education. The only way a society can continue to grow and prosper is through proper education at all levels.

Cape Peninsula University of Technology
Call Centre: +27 21 959 6767

Central University of Technology
Bloemfontein: +27 (0)51 507 391
Welkom: +27 (0)57 910 3500

Durban University of Technology
Switchboard: 031 373 2000

Mangosuthu University of Technology
Call Centre : 031 907 7111

Nelson Mandela University
Call Centre : 041-504 1111

North-West University
Call Centre : 0860 169698

Rhodes University
Call Centre : +27 46 603 8111

Sefako Makgatho Health Sciences University
Call Centre : (012) 521-4111

Sol Plaatje University
Call Centre : 053 491 0000

Stellenbosch University
Call Centre : +27 21 808 911

Tshwane University of Technology
Call Centre : +27 21 808 911

University of Cape Town
UCT switchboard: +27 (0)21 650 9111

University of Fort Hare
East London: 043 704 7000
Bhisho Campus : 040 608 3407
Alice Campus: 040 602 2011

University of Johannesburg
Call Centre : +27 11 559 4555

University of KwaZulu-Natal
DBN: +27 31 260 1111
PMB: +27 33 260 5111

University of Limpopo
Switchboard: (015) 268 9111
(015) 268 3332 / (015) 268 3276

University of Mpumalanga
Switchboard: (013) 002 0001
info@ump.ac.za

University of Pretoria
Switchboard: +27 (0)12 420 3111
info@up.ac.za

University of South Africa
Switchboard: 012 441 5888
study-info@unisa.ac.za

University of the Free State
Bloemfontein Campus: +27 51 401 9111
Qwaqwa Campus: +27 58 718 5000
South Campus: +27 51 401 9111

University of the Western Cape
Call Centre : +27 21 959 2911

University of the Witwatersrand
General enquiries : +27 (0)11 717 1000
Admission enquiries: +27 (0)11 717 1888

Vaal University of Technology
Call Centre : +27 (0)861 861 888
Admission enquiries: +27 (0)16 950 9356

University of Zululand
Switchboard : +27 (0)35 902 6000

Walter Sisulu University
Mthatha Campus : 047 502 2844

University of Venda
Call Centre: 015 962 8000

Don't let a compliance gap put your business at risk. As an official legal panel member for the SAIEE, Fairbridges Wertheim Becker, provides expert legal services to ensure your business stays compliant.

POPIA Compliance: Expert guidance to ensure your business meets the requirements of the Protection of Personal Information Act.

Data Privacy Reviews: Thorough assessments to identify gaps and mitigate risks.

Training & Workshops: Tailored training to equip your team with the knowledge to manage data privacy effectively.

CONTACT US FOR A DISCUSSION REGARDING YOUR NEEDS TODAY

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Zero-Party Data

- A BETTER FRONT DOOR - NOT A BACK DOOR AROUND POPIA OR THE GDPR

Every few months, a fresh marketing buzzword promises to make customer data easier, cleaner, and less regulated. "Zero-party data" is the latest candidate.

By: Jodi Poswelletski
Fairbridges Wertheim Becker

This article offers general information, not legal advice. If you're planning to collect or use zero-party data, reach out to your attorney for guidance tailored to your context.

It sounds neat: information people voluntarily hand over - preferences, intentions, context - collected through sign-up forms, quizzes, account settings or a simple "tell us what you care about" page. Because users type it in themselves, many assume the compliance hurdles vanish. They don't. Zero-party data can be excellent for accuracy and trust, but it still sits squarely inside the rules of Protection of Personal Information Act (POPIA) and the General Data Protection Regulation (GDPR).

Think of zero-party data as the opposite of guesswork. Instead of inferring what someone wants from cookies or tracking pixels, you ask them. That gives you clearer signals, fewer irrelevant messages, and a better experience for the person on the other side. It also creates a stronger paper trail for consent: when someone selects topics they'd like to hear about, or the types of events they prefer, you can show when and how they opted in. From a governance point of view, that's a win.

Where the myth creeps in is the idea that "because they gave it to us, we can use it however we like." Both POPIA and the GDPR say otherwise. Personal information is still personal information, no matter how it was collected. You still need a lawful basis to process it (often consent, sometimes contract), you must be upfront about what you will do with it, and you have to respect the fundamental rights: access, correction, deletion, and objection. You also remain accountable for security measures, contracts with any service providers who process the data on your behalf, and the rules for sending information across borders. Zero-party data changes the how of collection, not the whether of compliance.

If that sounds like a dampener, it shouldn't. The real value of zero-party data is that it helps align three things that usually rub against each other: relevance, respect, and regulation. Relevance improves because people tell you what they want. Respect improves because the value exchange is explicit: "share a bit about your needs and we'll give you content, updates or offers that actually matter." Regulation becomes more manageable because the record of what was asked and agreed is much clearer than the murk of behavioural profiling.

To get those benefits, design matters. Start by stating the purpose in plain language at the point of collection. If your form says, "Tell us which topics you want monthly updates on," keep the follow-up within that scope. If, later, you'd like to use the same answers for something new - say, sales outreach rather than a newsletter - don't quietly repurpose them; ask again or identify another lawful basis and explain it. That simple discipline addresses purpose limitation and fairness in one stroke.

Next, minimise the data you ask for. People are more willing to share when the questions feel proportionate, and both POPIA and the GDPR expect you to

request only what you need. Progressive profiling helps: begin with two or three fields that deliver immediate value, then invite people to add more over time if they find the helpful relationship. It's better to earn depth than to demand it up front. You'll also keep retention periods sane; if a preference hasn't been used or refreshed in a reasonable time, archive or delete it.

Clarity around consent is another common pitfall. Avoid bundled permissions that blur marketing, analytics and profiling into a single tick-box. Make choices specific and reversible. Pre-ticked boxes, obscure toggles and "take it or leave it" gates might lift short-term opt-in numbers, but they undermine trust and are unlikely to withstand scrutiny. A simple preference centre - visible in every email and easy to find on your website - pays for itself in reduced complaints and cleaner engagement metrics.

Don't overlook your vendors. The moment a survey platform, CRM, email tool or analytics provider touches your zero-party data, you need proper contracts in place that set out what they may and may not do, the security standards they maintain, and how they'll support you in honouring data-subject rights. If any data flows to servers outside South Africa or the EEA, assess the transfer mechanism and document your reasoning. "Our supplier said it's fine" won't cut it when questions arise.
There's also a cultural point worth making. Zero-party collection works best when it is part of a respectful conversation. Tell people why you're asking. Give them a quick win in return - better recommendations, a relevant download, an invitation that matches their role - so they can feel the benefit immediately. Then keep your promises. If someone told you they only want quarterly updates on two specific topics, resist the temptation to widen the net because end-of-month numbers look thin. The quickest way to ruin a consent record is to ignore it.

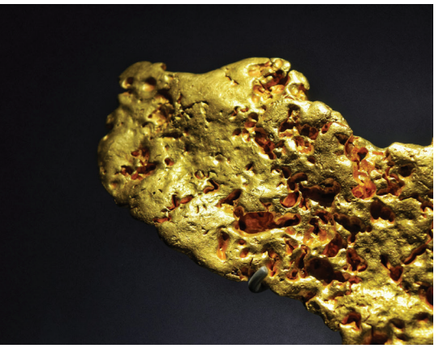
Finally, measure success the right way. The aim isn't to build the largest possible database; it's to build the most willing and useful one. Track the quality of engagement, the reduction in unsubscribes and spam complaints, the increase in conversions from communications people asked to receive, and the time your teams save because they're not chasing the wrong leads with the wrong messages. When those dials move, you know your zero-party approach is doing what it should: reducing noise while raising signal.

So, is zero-party data "a thing"? Yes, and a sensible one, provided it is treated as a better front door rather than a back door. If you design your questions with care, explain your purposes clearly, keep the scope narrow, and respect people's choices over time, you'll find that it strengthens both relationships and compliance posture.

If you treat it as a shortcut, you risk all the usual problems, just with a new label. wn

FEATURE

Can Battery Energy Storage Systems Help Power the Future of Mining in Africa?



Mining remains a cornerstone of economic output across many Sub-Saharan African nations, often contributing a substantial share of Gross Domestic Product (GDP).

As the global energy transition accelerates, the demand for critical minerals - such as cobalt, lithium and copper - is placing Africa's mineral wealth under renewed strategic focus.

To capitalise on this shift, many countries are intensifying efforts to modernise and extend their mining value chains, leveraging targeted investments in infrastructure, energy and technology to drive industrial growth and long-term sustainable development[1].

According to a leading Africa-focused investment conference, AFSIC - Investing in Africa, some of the biggest issues facing mines across the continent include infrastructure challenges around energy supply[2] (which includes issues of quality, reliability and availability).

Additionally, AFSIC notes that increasing demands from both environmental regulations and corporate sustainability targets mean that mining companies must reduce both operational costs and environmental impact while also maintaining production levels.

Against this background, the African mining industry is beginning to explore the viability of battery energy storage systems (BESS) as a potential solution to chronic power supply challenges.

We unpack the advantages of BESS technology after first looking at the current and future importance of mining across the continent.

MINING ACROSS AFRICA: A STRONG HISTORY

Mining plays a significant role in many African countries, with some nations showing potential that is not yet fully tapped. A snapshot of mining within the West, East and Southern African regions showcases a number of examples, as outlined by Energy Capital & Power (ECP), an Africa-focused investment platform for the energy sector, as well as other sources.

WEST AFRICA

Mali: The country's mining sector is experiencing a surge in investment, with mining expected to contribute approximately $1.2 billion to the country's economy for the first quarter of 2025, partly as a result of significant reforms undertaken during 2023. As Africa's second largest gold supplier and an emerging lithium provider, Mali continues to liaise with global investors while expanding exploration projects.

Ghana: According to travel platform Tourispot Ghana, gold mining has become one of the most vital sectors for Ghana's export revenue, with exports from gold in recent years accounting for up to 36 percent (2021) of the country's total exports, a figure that remained steady at 34 percent as recently as 2023. The gold sector adds to export revenues and plays a significant role in overall economic growth, providing employment for thousands of Ghanaians and supporting local businesses related to mining activities.

Over and above gold, as noted by ECP, other minerals such as manganese, bauxite (the primary ore used to produce aluminium) and diamonds also generate substantial revenue for the economy.

EAST AND CENTRAL AFRICA

There is significant mining potential in this region, which is diverse in minerals but faced with challenges that have an impact on the sector. These include a lack of capital and technology, and conflicts within the region, including in the Democratic Republic of Congo (DRC), which, as outlined by CNN, has grappled with civil conflict and war for decades.

Nonetheless, Reuters news agency reported that the country has recently become the world's second-largest copper producer (behind Chile in South America).

Tanzania has also seen recent and rising success in the mining sector, reaching a 10.1 percent GDP contribution in 2024, and becoming the fourth-largest gold producer in Africa (after South Africa, Ghana and Mali), as reported by the Tanzania Investing and Consultant Group.

SOUTHERN AFRICA (SADC REGION)

South Africa: We find that the country's mining industry, by generating R424.6 billion in national revenue in 2023, increased the country's GDP by 6.2 percent[3]. The mining industry furthermore provided nearly half a million (477,000) formal jobs, with some 7,500 jobs supplementing the economy in that year and thus supporting livelihoods against the background of a weak domestic economy. Efforts are underway to unlock further potential in the mining industry by addressing initiatives such as improvements in private sector participation in energy and transport.

Zambia: Mining plays a critical role in Zambia, adding around 15 percent to GDP, 70 percent of export earnings, and 44 percent of government revenues, as analysed by a recent World Bank report. Since 2022, several international mining companies have announced new investments in the country.

The rise of renewable energy technologies has also brought with it an escalating global demand for certain metals and minerals, many of which are to be found in abundance within Africa.

It is therefore in the continent's best interests to find solutions for energy and infrastructure challenges. While regulations remain the ambit of the sovereign nations themselves, Vertiv is strongly positioned to offer power solutions to mining operations across Africa.

LOOKING AHEAD: MINING TAKES ON EVEN MORE SIGNIFICANCE

Because renewable energy technologies require copper, worldwide demand for this element is projected to surge to over 30 million tonnes by the end of the decade, with a growth in the global copper market of around 70 percent predicted between 2020 and 2050[4].

Zambia's Copperbelt and North-Western provinces are part of the world's richest source of known reserves and estimated future discoveries. Cobalt, lithium and nickel are also important in the alternative energy transition, playing crucial parts in electric batteries and vehicles, as well as in solar panels, turbines and energy storage.

BESS: A GAME-CHANGER IN REMOTE MINING

Mining requires a dependable and

continues from page 31

constant electricity supply to power its energy-hungry operations - power costs represent up to 40 per cent of operating expenses in African mines[5] - and support the safety of its workers. An investment in backup energy is critical.

However, diesel generators are expensive to run and maintain, as well as being serious sources of pollution in a world that is increasingly aware of the growing fragility of the Earth. Investing in energy storage is therefore the way of the future, both economically as well as environmentally.

A battery energy storage system (BESS) stores energy for later use. Vertiv's BESS solutions are starting to demonstrate success in remote African mining operations, providing crucial support during grid fluctuations, and helping to manage unpredictable power supplies and grid stabilisation.

Vertiv BESS solutions are able to charge from the grid or other forms of local generation, including wind, hydro, solar and generators. Through the use of BESS technology, mines can store excess energy during periods of low demand.

Large banks of batteries are charged with surplus energy and then discharged when needed.

This stored energy can be used to supplement power supply during peak operating periods or when there are power cuts, something that is particularly useful for mines operating in remote locations with less reliable infrastructure.

This means that a BESS solution fills in as an emergency power source, supporting crucial safety systems, ventilation and other essential machinery can remain operational.

BESS installations are also designed to integrate easily with renewable energy generation in the form of solar panels or wind turbines.

This supports sustainability practices by decreasing reliance on a coal-powered national grid, or on expensive and polluting diesel generators. At the same time, a reduction in diesel usage and maintenance costs saves significantly on costs.

By addressing unreliable power supply, inconsistent feeds, irregular harmonic distortion, high costs, environmental pressures and infrastructure challenges within the mining environment, Vertiv's BESS solutions could be a proverbial 'game changer' in helping to transform Africa's energy landscape. wn

WILLS & ESTATE PLANNING

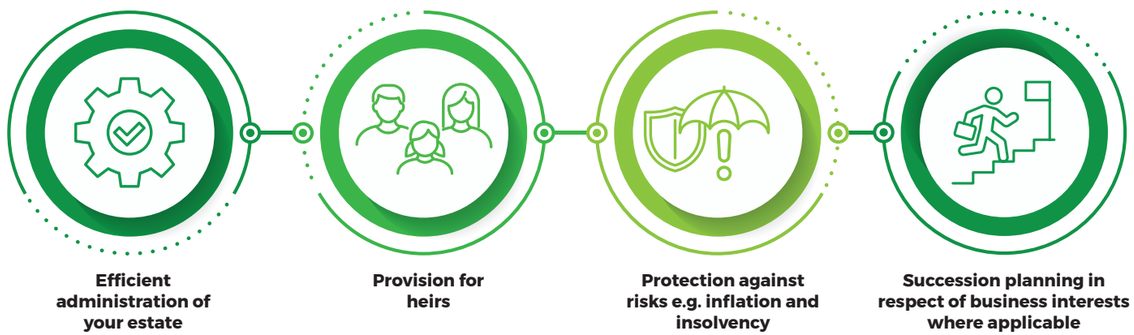
WHAT IS ESTATE PLANNING?

Your estate means everything you own like property, cars, jewellery and anything of value, as well as investments. The nett worth of your estate means everything you own less anything you owe. Estate planning involves planning how your nett estate will be passed on to your loved ones. It involves making a will, picking guardians for your kids, and setting things up so that your tax obligations are managed efficiently.

WHY IS ESTATE PLANNING IMPORTANT?

By putting a personalised estate plan and an updated and executable will in place, **you can help to ensure that assets will be transferred to your heirs in accordance with your last wishes**. By conducting an estate analysis you can determine the cost of winding up an estate and make necessary provision, this will ensure that the heirs end up with what you had intended.

REASONS FOR ESTATE PLANNING



The cornerstone of a solid Estate Plan is when there is sufficient liquidity to cover all liabilities, debts, income requirements of dependants, cash bequests of the will, divorce and maintenance obligations, estate duty and executor's fees to name but a few without having to sell the assets that you worked hard to acquire for your family. If there is a shortfall in your provisions, you can cover that by means of life insurance.

Speak to me now to help you draft a personalised estate plan and ensure a lasting legacy for your family.

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South Africa's Critical Minerals Strategy
- A NEW MINING FRONTIER

South Africa has taken a decisive step in shaping its economic and industrial future with the Cabinet approval of the Critical Minerals and Metals Strategy ("Strategy") in May 2025.

Article courtesy of
Bishop Fraser Attorneys

In the words of the Minister of Mineral and Petroleum Resources, the Strategy is a call to action for government, business, and communities to work together to unlock the nation's mineral potential.

It marks a deliberate shift from South Africa's historical role as an exporter of raw mineral commodities to becoming a globally significant player in mineral beneficiation, technology manufacturing, and clean energy innovation.

OBJECTIVES OF THE STRATEGY

The Strategy outlines a long-term framework to transform South Africa's mining economy.

Its key objectives are to:

- Promote economic growth through mineral-based industrialisation
- Enhance beneficiation and value addition across domestic mineral value chains
- Foster a globally competitive exploration and innovation environment
- Build a skilled workforce and support inclusive, sustainable development
- Strengthen regional mineral integration and global partnerships

By promoting mineral-based industrialisation, building a skilled workforce, and enabling exploration, the Strategy opens new frontiers for mining houses and junior operators to expand into downstream value chains and high-growth sectors such as green energy and advanced manufacturing.

CRITICAL MINERALS AND ESSENTIAL TECHNOLOGIES

The world's shift toward clean energy, digital connectivity, and sustainable mobility has elevated the importance of minerals such as lithium, cobalt, manganese, platinum group metals ("PGMs") and rare earth elements. These critical minerals are the backbone of essential technologies such as electric vehicles, energy storage batteries, solar panels, wind turbines, hydrogen fuel cells, and microchips.

South Africa's unique mineral endowment presents a rare opportunity to become a hub for these future-facing industries. For South African mining companies, this is a unique opportunity to reposition their business models. Minerals like PGMs, lithium, cobalt and vanadium are essential components for battery production, hydrogen technologies, and long-term offtake agreements with global OEMs

FACTORS USED TO IDENTIFY CRITICAL MINERALS

The Strategy defines critical minerals based on a multifactorial analysis applying the following eight indicators:

- Export potential
- Employment impact
- Supply risk
- Local economic significance
- Industrial importance
- Development alignment with national policy
- Substitutability
- Import reliance on non-domestic resources

This science-based approach enables South Africa to prioritise minerals essential for economic security, industrial development, and global competitiveness. For mining companies, this framework is a guide to which commodities will be prioritised for government support. It offers an opportunity to align operations with national priorities and potentially benefit from fast-tracked approvals, infrastructure support, and fiscal incentives.

STRATEGIC IMPORTANCE AND USES

Critical minerals go beyond just commodities, but play an essential role in global energy transition, defence technologies, and digital infrastructure. South Africa's reserves of PGMs and manganese are key to producing hydrogen fuel cells and decarbonised steel.

Lithium, cobalt, and graphite are essential to energy storage, while rare earth elements are required for advanced electronics, aerospace components and wind turbines. Enhancing the local use of these resources is critical to securing industrial resilience and participating in future global markets. South Africa's reserves of PGMs, manganese, and rare earths give its mining industry a first-mover advantage in building resilient, ESG-compliant supply chains.

STRATEGIC PILLARS OF THE STRATEGY

Six interconnected pillars underpin the Strategy:

1. **Geoscience Mapping and Exploration**
   Investment in mapping and exploration is essential to discover new deposits and replace depleting reserves. A key intervention is the support for junior miners and the introduction of a flow-through share scheme to stimulate private investment.

2. **Value Addition and Localisation**
   The Strategy encourages mineral beneficiation at source. It includes plans to develop battery manufacturing capacity, revive ferroalloy smelting, and invest in hydrogen fuel cell production. Special economic zones and beneficiation hubs will anchor this localisation drive.

3. **Research and Development and Skills Development**
   This pillar supports innovation in battery chemistries, cleaner processing methods, and PGM-based technologies. It also prioritises skills development across the value chain through accredited programmes and partnerships with universities and training institutions.

4. **Infrastructure and Energy Security**
   Efficient ports, rail, digital connectivity, and reliable energy supply are prerequisites for value addition. Reforms under Operation Vulindlela and new investment in green infrastructure are critical enablers.

5. **Financial Instruments for Local Beneficiation**
   The Strategy proposes fiscal incentives, differentiated electricity tariffs, and loan guarantees to support domestic processing and manufacturing. It also seeks to reward ESG-compliant projects.

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CLASSIFICATION	MINERALS
High-Criticality	Platinum, Manganese, Iron Ore, Coal, Chrome
Moderate to High Criticality	Gold, Vanadium, Palladium, Rhodium, Rare Earth Elements
Moderate Criticality	Copper, Cobalt, Lithium, Graphite, Nickel, Titanium, Phosphate, Fluorspar, Zirconium, Uranium, Aluminium

CRITICAL MINERALS CLASSIFICATION

6. Harmonisation of the Regulatory and Policy Framework

A one-stop-shop licensing system and alignment across departments (environment, water, mining) will improve regulatory certainty and investor confidence.

CONCLUSION

South Africa's Critical Minerals and Metals Strategy represents a national blueprint to transform the country into a global hub for green energy, advanced manufacturing, and mineral-based industrialisation.

By prioritising 21 minerals essential to technologies like EVs, hydrogen fuel cells and batteries, the Strategy aims to move the country up the value chain through beneficiation, infrastructure investment, and skills development.

For mining companies, this signals a clear shift: future operations will be shaped by localisation, ESG alignment, and value-added mandates. Those who align early stand to benefit from regulatory certainty, new investment incentives, and access to high-growth markets in energy, mobility, and clean tech. wn

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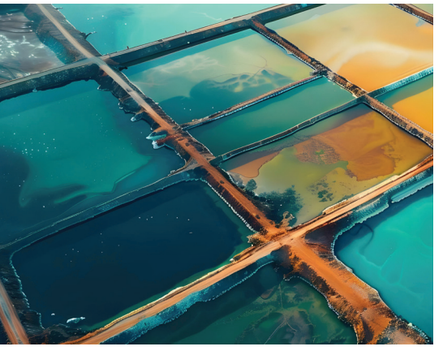
How critical energy minerals could be Africa's catalyst for sustainable development



Africa's economic landscape has been significantly shaped by mining, and the sector continues to represent a significant employer and component of African nations' GDP and trade balances.

Article courtesy of *World Economic Forum*

While challenges persist, the continent's vast critical energy mineral reserves offer transformative opportunities, particularly in the context of the global energy transition.

Minerals such as bauxite, chromium, cobalt, copper, graphite, lithium, manganese, and nickel are vital for producing batteries, fuel cells, and other components used in renewable energy systems, technologies, and electric vehicles.

As the world shifts towards clean energy solutions, the demand for these resources is projected to increase exponentially. For example, BHP Billiton projects that by 2050, there will have been a 70% increase in global copper demand compared to 2020.

With Africa holding meaningful shares of the worldwide reserves of copper and these other critical energy minerals, therein lies an opportunity for the continent to gear sustainable development initiatives and projects.

AFRICA'S CHALLENGES WITH RESOURCES

Despite its resource riches, Africa has lagged in terms of development – a legacy of colonialism as well as underinvestment in the post-colonial era.

Today, most African economies are classified as low-to middle-income, and they face complex developmental challenges exacerbated by structural inequities, energy deficits and high unemployment.

One manifestation in the mining sector is limited value-added beneficiation – the treatment of raw material (such as iron ore) to improve physical or chemical properties, especially in preparation for smelting.

Particularly in view of the clean energy transition, this presents an opportunity. By developing local industries to process critical energy metals and minerals into higher-value products, Africa can drive industrialisation and expand its own energy access.

Indeed, prioritising beneficiation and attracting investment into the energy minerals sector can enhance the resilience of many African economies and reduce their dependence on raw exports.

An example is the global battery manufacturing industry, which is projected to employ more than 10 million people by 2030, with significant economic growth expected in regions that invest in local battery and electric-vehicle component manufacturing.

ENERGY DEMAND AND REGIONAL COOPERATION

By capturing even a small share of this market, Africa could create 500,000 to 1 million jobs, thereby reducing unemployment and the outflow of skilled labour.

A virtuous circle will come into play because shifting from raw material exports to domestic processing could drive up electricity demand by up to 30%, in turn necessitating investments in clean energy generation and grid expansion.

This will lower energy costs and count towards African nations' nationally determined contribution (NDC) goals, per the Paris Agreement climate accords.

Meanwhile, regional initiatives like the African Continental Free Trade Area (AfCFTA) could help develop energy-efficient processing hubs, potentially lowering electricity costs.

These kinds of transition developments and initiatives have the potential to increase Africa's annual export revenues by over $10 billion, thereby bolstering fiscal resources and enhancing debt servicing capabilities.

THE STRATEGIC OPPORTUNITY FOR AFRICA

The global shift towards renewables is Africa's chance to position itself as an important strategic player in the energy transition.

Africa holds a significant share of the world's future energy mineral reserves. Platinum group metals, mined in South Africa and Zimbabwe, are crucial for green hydrogen and decarbonising heavy transport, heating and industry. Chromium, also extracted in South Africa and Zimbabwe, is important for concentrated solar power, geothermal, nuclear, hydropower, and wind technologies.

Cobalt and manganese are essential for lithium-ion batteries used in electric vehicles and energy storage, and for technologies such as concentrated solar power, wind, hydro, and geothermal energy generation systems.

Mining industries across Cote d'Ivoire, the Democratic Republic of Congo, Gabon, Ghana, Madagascar, South Africa and Zambia supply much of the world's current demand for these materials.

Graphite and lithium, too, are key inputs for green technology and energy system components, and mines in countries including Namibia, Mali, and Tanzania fulfil significant proportions of global demand. Guinea, meanwhile, is the world's leading producer of bauxite, the primary raw material for aluminium – vital to many production processes and secondary industries.

To harness the potential value of this incomplete snapshot of the continent's critical energy minerals, African countries should adopt a holistic, strategic approach involving regional collaboration, infrastructure development, partnerships with global powerhouses in the energy and mining sectors, and investment in human capital.

By envisioning the regearing of its mining industries towards sustainable development and practices, and positioning – expanding – their role within regional beneficiation hubs of manufacture and value-add, African economies can fully participate in the energy transition and grow at a rate commensurate with that needed to uplift incomes and living standards of people.

Africa stands at a pivotal moment. By strategically managing its vast resources of critical energy minerals, the continent can drive economic growth, create jobs and secure a prosperous future for the citizens of many countries on the continent. wn

Smarter Safety

- HOW PROXIMITY DETECTION SYSTEMS ARE REDEFINING MINING OPERATIONS

Anton Lourens,
Chief Executive Officer, Booyco Electronics

In the dynamic and often hazardous world of mining, the focus on safety has traditionally centred around personal protective equipment and procedural controls. Today, that focus has expanded - and deepened - through the integration of smart technologies that not only prevent accidents but also deliver actionable data for operational improvement.

A key pillar of this transformation is the use of Proximity Detection Systems (PDS), which have evolved from basic collision alerts into sophisticated digital platforms. One of the pioneers in this space is South Africa's Booyco Electronics, whose ongoing innovation in the field is helping mines transition from reactive safety to intelligent data-driven risk management.

THE DIGITAL SHIFT IN MINING SAFETY

PDS solutions were first introduced as early warning systems, primarily to alert operators when personnel were too close to moving machinery. However, advances in sensor technology, radio frequency communication and GPS positioning have dramatically extended their role. Today, modern PDS platforms can identify, track and log the real-time locations of people and equipment, creating an additional layer of protection around every high-risk scenario.

According to Anton Lourens, CEO of Booyco Electronics, the company's journey mirrors this broader technological shift. "We started with a simple collision warning system in response to the coal sector's urgent need for enhanced worker protection. Since then, our technology has evolved into a fully integrated PDS ecosystem that is being deployed across surface and underground mines."

UNDERGROUND VS SURFACE

- Tailored Tech for Different Terrains

The environments in which PDS systems are deployed have a significant bearing on the technologies they use. Underground mines, where GPS signals are unavailable, rely on very low frequency (VLF) radio waves that can travel around corners and through rock. Personnel carry RFID tags, often embedded in their cap lamps, and these interact with sensors mounted on TMM equipment to detect dangerous proximity.

On surface mining sites, where GPS is available, the systems can incorporate satellite tracking and real-time vehicle-to-vehicle communication. "Each deployment is unique," says Lourens. "Even within the same site, different machines or working areas might have different proximity rules and requirements. That is why our systems are built to be configurable - the hardware may be standardised, but the intelligence behind it is highly adaptable."

LEGISLATION DRIVES ADOPTION

In South Africa, the adoption of PDS technology is no longer optional. Since December 2022, regulations have required mining operations to implement proximity detection as part of their broader safety systems, particularly where mobile equipment is involved. This mandate has accelerated adoption but also raised the bar for implementation, requiring a high level of integration with OEM systems, operator awareness training and site-specific configuration.

"The legislation brought safety engineering controls to the forefront, but it also highlighted the need for broader change management," explains Lourens. "It is not just about the technology. It is about getting people adapting, ensuring it is correctly integrated into the mine's operations and offering long-term support."

To this end, Booyco Electronics doesn't simply supply the systems – the company also helps mines design and implement training programmes, conduct operational readiness assessments and adapt procedures to align with new safety workflows.

FROM COMPLIANCE TOOL TO OPERATIONAL ASSET

While regulatory compliance is a strong motivator, many mines are discovering that proximity detection systems deliver benefits far beyond safety. By capturing real-time data on vehicle movements, personnel positioning and traffic density, these systems are becoming valuable tools for improving productivity and optimising resource deployment.

"This technology gives mines visibility they have never had before," says Lourens. "It can identify congestion hotspots, unauthorised zone entries and even equipment idle times - all of which can inform smarter planning and scheduling."

As these systems can be integrated with other digital platforms - such as mine planning tools, fleet management systems and control room dashboards - the potential for operational synergy grows. The ability to visualise and manage movement across a mine in real time can lead to better decisions, reduced downtime and improved asset utilisation.

THE ROAD AHEAD

- Smarter, Safer, More Connected

The next leap in PDS development lies in interoperability and sensor fusion. This involves blending various sensing technologies - such as camera, radar, LiDAR, RFID and GPS - into a unified platform that can provide more accurate and context-aware responses.

International standards are also playing a role, particularly ISO/TS 21815-2 (2021), which sets out how PDS systems should interface with mobile machinery. These guidelines are helping to drive compatibility across different OEM platforms, making it easier for mines to adopt standardised approaches across mixed fleets.

Lourens is optimistic about what lies ahead. "Proximity detection is no longer just a safety box-tick. It is a strategic tool for mine performance and worker protection. The technology is becoming smarter, more flexible and better suited to the real-world complexity of mining."

Reinventing Risk Management in Mining

What started as a collision warning device has become a cornerstone of intelligent safety in the mining sector. With companies like Booyco Electronics leading the charge, PDS is enabling mining operations to move beyond compliance, into a new era where safety and performance go hand in hand.

As the sector continues to adopt digital solutions to address age-old challenges, proximity detection stands out as one of the clearest examples of technology directly saving lives - and shaping a more sustainable, efficient future for mining. wn

Eskom's overhead medium voltage distribution network

– AN EXPLAINER

If one drives almost anywhere in South Africa – apart from very urban or very far-flung places – there are woodpole power lines – such as the one in Figure 1 – distributing electricity to consumers. They are so ubiquitous that even a seasoned electricity distribution engineer stops seeing them after a while.

By: Andreas Beutel (FSAIEE), Pako Meruti, Rudi Kruger
Eskom Holdings SOC Ltd

But yet they are there – Eskom alone operates upwards of 300,000 km such lines [1] In fact, Eskom's overhead medium voltage distribution network is the backbone of electricity supply across vast swathes of South Africa, delivering power to consumers via ubiquitous woodpole power lines.

So at what voltages and in what environmental conditions are these power lines required to operate, why do we use wood poles and what influences their design and technology choices? This article covers these topics and also lists some further reading for interested readers.

Figure 1: Typical medium voltage distribution line

HOW DISTRIBUTION LINES FIT INTO A POWER SYSTEM [2][3]

Electrical energy generated at a power station is transported in bulk via the transmission system, most often seen as the large lattice steel structures that criss-cross the country, albeit in much smaller numbers than distribution lines. Transmission lines typically operate at voltages of 220 to 765 kV. These voltages are then stepped down at transmission substations to sub-transmission voltages of 44-132 kV. Sub-transmission lines form the first level of distribution, but this voltage is still defined as high voltage. Distribution substations reduce this voltage further to medium voltages such as 11 or 22 kV. The final step is then to convert to the low voltage that we use in our homes, schools and offices – this is done by pole-mounted transformers or ground-mounted mini-substations. An example of a small rural transformer installation is shown in Figure 2.

Figure 2: Example of a small rural transformer installation

This article covers the overhead medium voltage (MV) part of the grid, since this is the most extensive part of Eskom's overhead network [1] – and hence the one most visible.

POLE MATERIAL

Wood has several advantages in this application, including low capital cost, generally good insulation properties (apart from the few instances mentioned later), no significant foundation required and generally easier to handle and install than other materials such as concrete and steel. Being a natural material, there is quite a wide range in properties between individual poles, but this is well understood and is addressed in industry standards. While wood does require periodic maintenance, primarily to protect against environmental degradation and pests, its treatment at the factory before delivery significantly extends its lifespan and limits ongoing maintenance needs.

ENVIRONMENTAL CONDITIONS IN WHICH MV LINES OPERATE

South Africa has a large range – and variety – of environmental conditions under which power distribution systems are required to operate. Some, such as daily, seasonal and spacial temperature and wind variations, are well understood. Others, such as lightning protection and the effect of pollution, are also well understood but less easily predicted. In fact, it is design factors such as lightning and pollution that dictate a large part of what MV lines look like. These two aspects are therefore the focus of this paper.

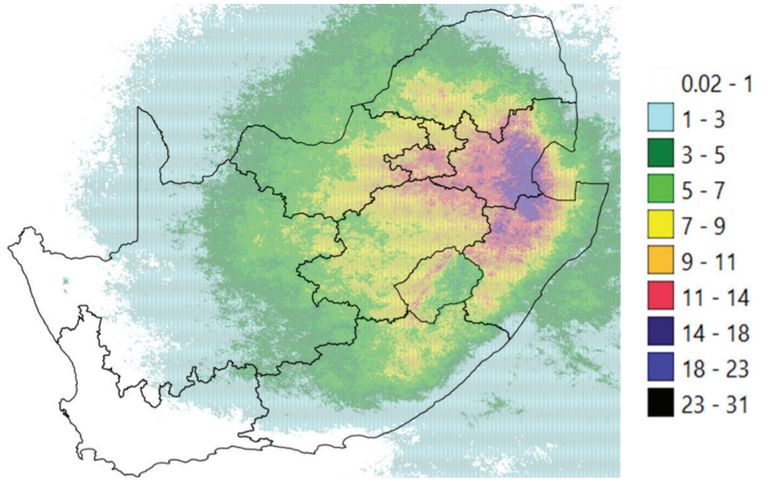


Figure 3: Lightning ground flash density (flashes/km2/year), with varying colours indicating different densities as per the legend [4]

LIGHTNING

Lightning is an often-destructive, yet well-understood, phenomenon. There are very many lightning strikes across South Africa each year, as shown in Figure 3.

Lightning interacts with distribution lines in two main ways, as shown in Figure 4. The first, indicated by the yellow arrows, is a direct strike to the phase conductors. The lightning current splits according to the impedance paths available; in this example into two paths, with each "half" flowing along the conductor looking for a path to ground. The path to ground may either be at a structure or via the nearest transformer – whichever is the most attractive path because it has the lowest insulation level. This is called the basic insulation level (BIL) and is measured between the phase conductors and earth.

The second interaction that lightning has with power lines is by induction – shown by the orange markup in Figure 4. This occurs when lightning strikes an object in the vicinity of the line, and induces a voltage onto the conductors of the line.

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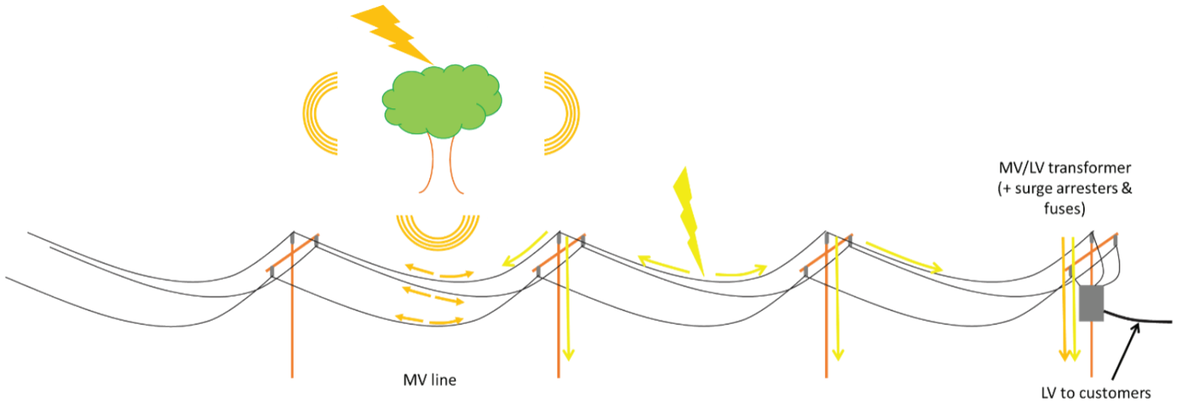

Figure 4: Lightning interaction with MV distribution lines

The magnitude of this voltage is much lower than that set up by a direct strike, but still needs to be addressed in the design philosophy of the line.

Protection against lightning presents the designer with an important and fundamental choice: whether to shield or not. Shielding involves the inclusion of one or more earthed conductors above the energized phase conductors, to intercept lightning strikes and conduct them safely to earth, thereby protecting the phase conductors and equipment such as transformers connected to the phase conductors.

The choice is a simple one for designers of transmission lines, because the high reliability requirements for these lines necessitate the use of shield wires. However, shield wires require the inclusion of specific earth electrodes and/or improved insulation – something which can be justified for transmission lines. Distribution lines – MV lines specifically – have much tighter cost constraints because of the much lower power that they carry, so installing and maintaining earth electrodes is not economically justified in most cases. Eskom therefore operates the vast majority of its MV lines without shield wires. This is not a big problem, because the design philosophy is adapted accordingly. More information about this choice is contained in [17].

One part of that philosophy is choice of BIL. There are three options for this:

- Maximum BIL (> 1 MV): includes no deliberate earthing or other means for reducing the BIL.
- Lowest possible BIL (< 200 kV): all un-energized pole-top metal hardware is electrically connected (bonded) together, and earthed via an earth wire that runs down the pole and into the ground. This leaves only the insulators between the energized phase conductors and earth.
- Medium BIL (about 200-300 kV): as for the previous case, but a deliberate gap is inserted into the earth wire running down the pole – to add a wood gap in series with the insulators, thereby increasing the BIL.

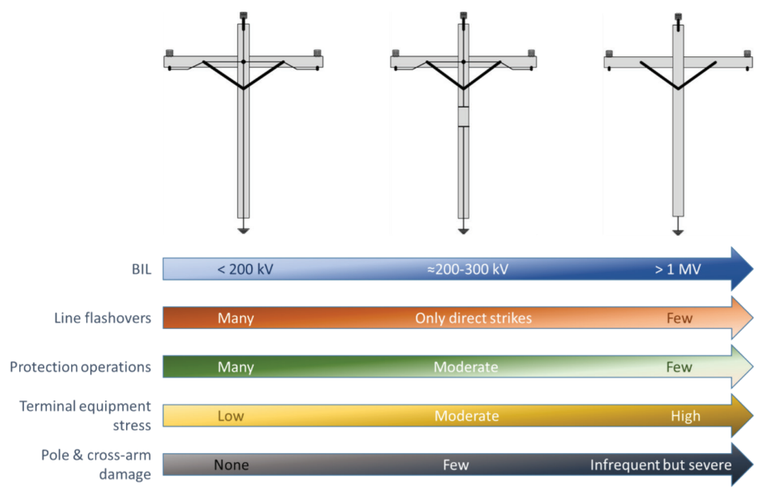

Figure 5: Comparison of structure insulation options

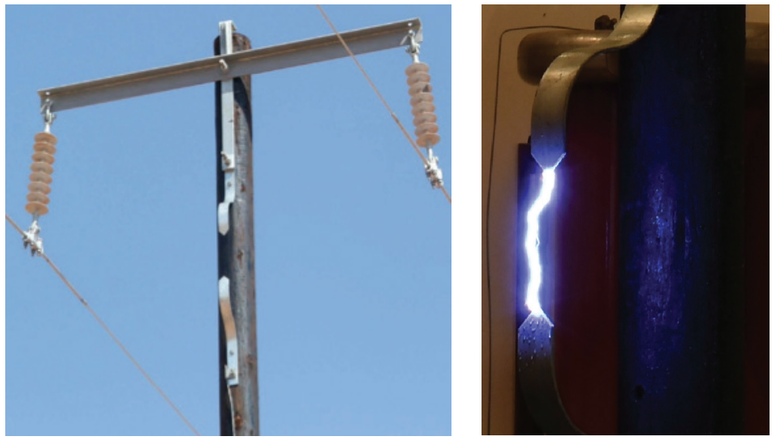

Figure 6: BIL spark gap – installed in the field [8] and flashover generated in a laboratory

These three options are compared in Figure 5. This shows that the low-BIL option provides the best protection for terminal equipment such as transformers and their fuses and surge arresters, but results in many flashovers due to lightning along the line, resulting in many protection operations and hence high stress on reclosers and other line protection equipment. It also results in little or no structural damage due to lightning flashover because the wood is in effect short-circuited by the electrical bonding.

The other extreme – where there is no deliberate bonding and earthing – results in few flashovers due to lightning, and hence in few operations of the line protection. However, most lightning surges are let through to the terminal equipment, resulting high stress and hence more frequent failures of this equipment. Also, when there is a flashover on the line it is likely to result in structural failure.

The medium BIL option gives the best compromise between the advantages of the two extremes, because only direct strikes flash over on the line, thereby providing reasonable protection to terminal equipment, while keeping line flashovers to a minimum. However, simply creating a gap in the downwire (as shown in Figure 5) is not sufficient because flashover across the pole surface can damage the pole. Eskom has therefore developed a spark gap to safely divert the flashover away from the pole's surface, as shown in Figure 6.

More information, albeit from a North American perspective, on lightning protection of distribution lines may be found in Short [13] and IEEE Std 1410-2010 [15]. More information on Eskom's philosophy and experience with respect to lightning protection of MV lines may be found in [5], [6] and [8].

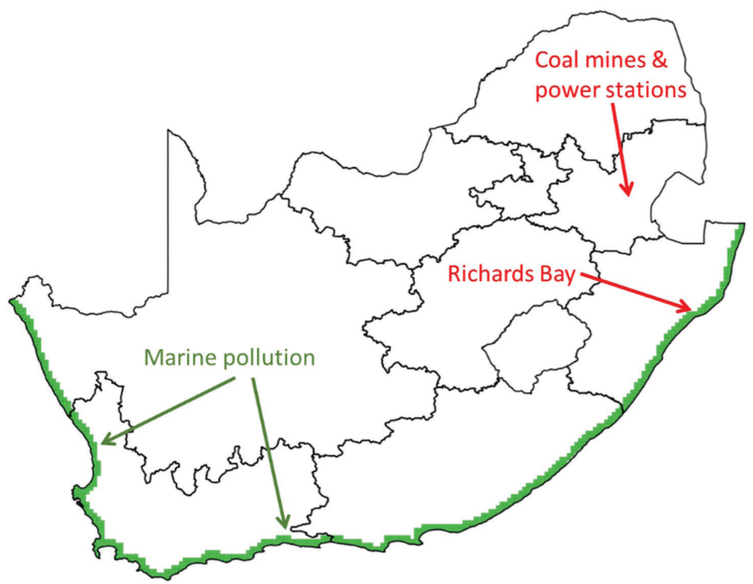

Figure 7: Examples of pollution sources in South Africa

POLLUTION

Atmospheric pollution affects insulator performance, and can result in pole-top fires. Marine pollution, e.g. salt spray, is probably the most widespread type of atmospheric pollution, but industrial pollution can also be a problem. Locations of some pollution sources are shown in Figure 7 – marine in green and industrial in red.

Pole-top fires are caused by small currents in the mili-Ampere range, known as leakage currents, flowing over the surface of polluted insulators

continues from page 45

Figure 8: Wood tracking due to leakage currents

that become wet, e.g. due to mist, fog or drizzle (not heavy rain that cleans the insulators). If these leakage currents are allowed – by the design of the structure – to travel inside or on the surface of the wood of the structure, there may be arcing, tracking (the formation of conductive paths), and ignition of the wood. An example of tracking is shown in Figure 8.

The most effective insulation coordination option of Figure 5 with respect to limiting pole-top fires is the low BIL option, because leakage current is conducted in the metal of the bonding and earthing, and not by the wood. However, this is not acceptable from a lightning performance perspective, as described earlier. A wood gap is therefore required in the wire running down the pole (BIL gap).

Leakage current flows to ground via that wood gap [16]. A certain amount of pole-top fire risk is therefore required to be accepted by a utility by the introduction of the wood gap. Field experience has however shown that the risk of a pole burning in the BIL gap is much less than that of a wood cross-arm burning.

The insulators also need to be judiciously chosen to limit the magnitude of the leakage currents, and to safely conduct these currents onto the bonding. More information Eskom's research into mitigation of pole-top fires may be found in [8], [9], [10] and [16].

BIRD SAFETY

In many areas, especially the more arid parts of the country, power lines are an attractive place for birds to perch because there are few trees or tall shrubs. This is especially true for raptors such as eagles and vultures, who can use tall objects as a vantage point for spotting their next meal. Making structures safe for large birds such as eagles and, especially, vultures to perch on is therefore also important. In other words, to ensure that there is acceptably low risk of birds being electrocuted by making simultaneous contact with an energized object and an earthed one or by making contact with two objects at different voltages. Again, Figure 5 provides some examples:

- The low BIL option, while good for preventing pole-top fires, is dangerous to large birds because earth potential is transferred to the top of the structure by the continuous downwire. This means that – for the medium voltage line – earth potential is within the wingspan of large birds away from the phase conductors on top of the insulators. This is illustrated by the yellow danger signs in Figure 9.
- Figure 9 shows that there may also be danger of electrocution between phases (orange markup), since these are at different voltages to one another.

Mitigation is implemented, firstly, by utilizing structure configurations that are inherently safe for birds, for example:

- Inserting a BIL gap into the downwire, i.e. using the medium BIL option of Figure 5, reduces the risk considerably for phase-to-earth electrocutions. It doesn't entirely eliminate the risk because wet wood may still in certain cases be sufficient to conduct enough current to cause a mortality. New poles also tend to be more conductive than seasoned poles.
- Hanging the outside phase conductors below the cross-arm effectively moves these conductors out of reach of large birds.
- Covering the remaining accessible energized parts, such as the centre

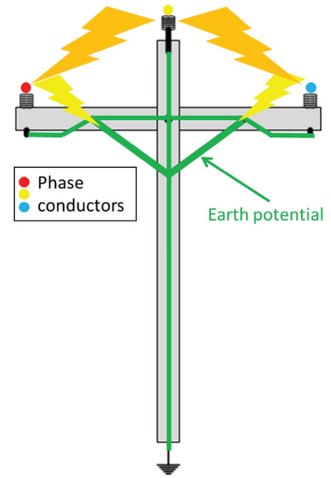

Figure 9: Possible electrocution modes for large birds

phase conductor in Figure 9 or jumpers on more complex structures, reduces the risk to an acceptable level.

Figure 10 shows an example of a structure that is as bird-safe as reasonably possible because the outside phases are hanging below the cross-arm, it has a BIL gap and the centre phase is covered.

More information on Eskom's research on bird safety on MV power lines may be found in [7].

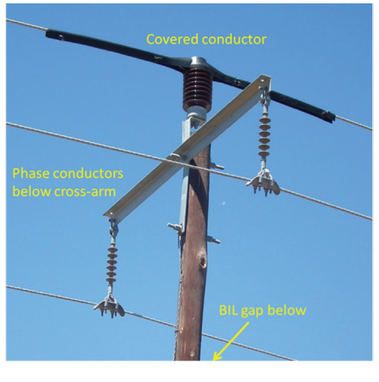

Figure 10: Example of a bird-friendly structure

THE IMPORTANCE OF INSULATION COORDINATION

Insulation coordination is defined by Hileman [11] as "the selection of the insulation strength". EPRI [12] elaborates by stating that good insulation coordination helps to achieve high reliability of lines and substations. While EPRI states this in the context of transmission systems, the same principle applies to distribution networks. For example, Short [13] states that "insulation coordination for distribution systems involves checking to see if there is enough margin between the voltage across the insulation and the insulation's capability."

This is applied on real overhead distribution networks by ensuring that expected overvoltages are understood, and that the insulation of the entire system is designed to ensure a sufficiently safe and reliable supply of power.

For example, it is accepted that lightning will at times strike the phase conductors of unshielded lines; the use of the medium BIL option ensures that these strikes are safely conducted to earth. It is therefore ensured that most lightning strikes do not reach terminal equipment such as substations and pole-mounted transformers.

Insulation coordination for power frequency (50 Hz in South Africa) is also very important, because the system needs to be able to withstand normal voltage levels and expected overvoltages. Insulators and bushings are therefore specified accordingly. Surge arresters are also selected to withstand the highest expected 50 Hz voltage, while still protecting the equipment (transformers) in question. Transformer insulation is in turn designed to withstand the voltage that surge arresters normally limit the voltage to.

The result is an insulation design that takes advantage of commonalities, such as the need for bonding and earthing for both lightning and leakage current, and balances competing constraints, such as the need for earthed downwires for some applications and not for others.

The use of wood as insulation medium in series with the insulators (to achieve the optimal BIL) is an integral part of the approach. There is therefore a generally high impedance that can vary depending on environmental conditions between the pole-top bonding and earth. This due to the usually high (but naturally variable) impedance of both the wood gap and the connection between the earth wire and the ground. This is advantageous in limiting the number of temporary faults, but a permanent fault – such as a failed insulator or a detached conductor – may not be detected by the protection system because the fault may result in insufficient fault current. The risk of such a situation occurring is limited by setting appropriate material, design and maintenance standards.

It is therefore clear that there is no perfect insulation coordination approach, as each has its advantages and drawbacks.

BUT THERE ARE LINES THAT DON'T LOOK LIKE THIS

There is a wide variety of different structures currently on Eskom's network, and probably on the networks of most distribution utilities. Reasons for this include the following:

- Lines don't always run in a straight line, most deviations require strain structures, i.e. the use of stays (this

continues from page 47

article focusses on intermediate structures for simplicity). Also, some structures are much more complex than a simple intermediate structure such as that shown in Figure 1. Examples are where transformers, reclosers, regulators or isolators are installed or when a spur tees off from the main line. In all cases, the same broad philosophy is applied, but how it is implemented or other specific details may by the nature of the application differ.

- Some parts of the country have low lightning or pollution levels or low incidence of large birds, so a wider range of structures is permissible.
- The design philosophy described is the current one, the applicable standards at the time that older lines were built may have differed from this. Standards are continuously updated with the latest knowledge, but it is impractical and too costly to bring existing lines up to the latest standard whenever the standard changes. The same is true where Eskom has taken over networks from other utilities – the standards used by those other utilities may have differed from Eskom's current philosophy.
- There are also specific cases where a different structure (or set of structures) had to be used, such as long spans due to river crossings, where heavy conductors are required or where the use of insulated conductor or other pole material was required.

Examples of different structure configurations are shown in Figure 11.

DISCUSSION

All electricity distribution utilities must take into account the environment in which they operate. This is onerous because of their large footprint and because many of their assets are directly exposed to the elements. Some of those elements have been discussed here. These are natural elements related to the climate, weather and nature. Other examples of natural phenomena are storms, ice, snow and veld fires. It is clear that the type and severity of natural phenomena varies from area to area, and that this directly affects the design of electricity networks in each area.

Human elements should not be discounted, however. An example is the contribution of industrial pollution to pole-top fires, as covered earlier in this article. More direct human interaction includes vehicle collisions with poles, theft, vandalism and illegal connections.

There is no perfect approach to the insulation coordination of overhead MV distribution networks, as each has its advantages and drawbacks. However, the approach chosen has served Eskom well. Nonetheless, further work has been undertaken to further optimize this approach. The latest publications are [14] and [17].

The above all shows that there is a lot of due diligence that goes into compiling standards for the design of MV distribution networks. These standards are the result of many years of experience, and are updated as knowledge and technology advance and as the operating environment changes.

ACKNOWLEDGEMENTS

The substantial contribution of the many Eskom colleagues – present and former – to this field is gratefully acknowledged. Without them an article such as this would not be possible. The authors wish to particularly mention Bruce McLaren, Hendri Geldenhuys, Willem Dirkse Van Schalkwyk, and the countless field staff who freely gave their time and experience. wn

REFERENCES, BIBLIOGRAPHY AND FURTHER READING

Figure 11: Examples of a strain structure (left), tee-off (centre) and recloser structure (right)

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Eskom's Latest Legal Challenge Against Nersa

- ENSURING FAIRNESS IN THE AWARDING OF TRADING LICENSES WITHIN SOUTH AFRICA'S ELECTRICITY ENERGY MARKET

This article examines Eskom's most recent legal challenge against the National Energy Regulator of South Africa ("NERSA") regarding the issuance of trading licenses to five electricity traders.

By: Professor Vally Padayachee, CEng; CD(SA); MBA; MSc (Eng); Pr CPM; Pr Cert Eng; EDP (Wits). Power and Energy Expert

Eskom contends in a 374 pages court submission document inter alia that these licenses were granted without a comprehensive regulatory framework, undermining its operational integrity and threatening the stability of the South African electricity market. The discussion highlights in the opinion of the author the importance of a rules-based economy underpinned by our constitutional democracy, emphasising fairness, equity, competition, and consultation among stakeholders. It explores the implications of trading licenses on Eskom and municipal electricity utilities, ultimately advocating for a comprehensive fit-for-purpose regulatory framework with associated effective rules that ensures fair and equitable competition and protects the interests of all market participants in the best overall interests of SA Incorporated.

INTRODUCTION

Most recently Eskom has taken a monumental step by challenging the NERSA in the High Court of Gauteng. The contentious nature of this legal dispute stems from Eskom's objection to the licensing of five electricity traders by NERSA in the absence of a comprehensive regulatory framework and associated effective rules for issuing trading licenses, which Eskom believes undermines its operational framework and threatens the integrity of a stable energy market in South Africa. The crux of the matter seemingly revolves not simply around competition but about establishing a fair and equitable playing field within a rules-based economy, ensuring that the operational prerogatives and obligations of Eskom, as the primary utility, remain safeguarded whilst fostering a healthy competitive environment.

At the heart of this dispute lies Eskom's assertion that it is not against competition per se; rather, it advocates for a structured approach whereby existing entities like Eskom, as well as new entrants into the market, can coexist and engage fairly. This point is especially important as the court application brought by Eskom seeks to protect not only its own interests but also those of municipal electricity utilities.

As the largest state-owned distribution electricity utility, Eskom holds a significant role in the electricity energy ecosystem of SA and recognises that a potential "free for all" licensing of traders who also operate in municipal electricity supply areas has the potential to disrupt this balance.

Eskom, NERSA, municipalities, etc operate in the context of an overall constitutional democracy, where rule of law, regulations, and established frameworks and associated effective fit-for-purpose rules are paramount in shaping a just economic landscape. Therefore, Eskom's actions resonate with a broader commitment to governance, equity, and functionality within our electricity energy sector, aiming to protect all participants from a potential chaotic and inequitable market.

THE CONTEXT: A RULES-BASED ECONOMY

In a democratic society or a constitutional democracy like SA, particularly in one that values fairness and transparency, the existence of a rules-based economy is indispensable. The rules and regulations that govern the market serve several vital purposes:

1. Establishing fairness: The rules ensure that every participant has a fair opportunity to engage, which is crucial in promoting healthy competition among businesses and providing equitable access to resources.

2. Promoting stability: They aid in creating predictable outcomes that encourage investment and innovation, which are fortified in an environment guided by clear operational rules.
3. Protecting rights and interests: Laws, regulations and rules serve as a bulwark against exploitation, fostering trust within the economy by safeguarding the rights of consumers, businesses, and workers alike.
4. Conflict resolution: The structured legal framework offers mechanisms for settling disputes, paving the way for harmony where participants can seek redress through established processes instead of resorting to conflict.
5. Encouraging responsibility: By adhering to rules, entities are compelled to act responsibly and consider the broader impacts of their actions on communities and the environment.

The court case between Eskom and NERSA seemingly illustrates in the opinion of the author an embodiment of these principles not only as they pertain to Eskom, but also for all market players wishing to engage within the framework outlined by laws and regulations.

THE IMPLICATIONS OF THE TRADING LICENSES

Eskom's contention regarding NERSA's issuance of trading licenses to private entities hinges on several critical issues:

1. Lack of a governing framework and rules: Eskom's primary objection that NERSA is granting trading licences in the absence of a clear and established regulatory framework and specific rules for trading licences. Eskom believes that it is not sensible or appropriate to approve licence applications before the proper framework is in place to balance the various interests that are affected by the grant of trading licences. These include Eskom's viability and the public interest in the framework being efficient and workable.

2. Infringement of Eskom's existing licence and areas of supply: Eskom posits that granting trading licenses to these entities violates its current distribution licenses, which grant it exclusive rights to supply electricity in specified areas. The historical context is significant; before the advent of these licenses, Eskom was assured that it would not face competition from multiple suppliers within its operational domain. The unauthorised encroachment on its service areas raises serious concerns about adherence to already established rules.

Eskom current distribution licences, which include the right to supply electricity grant it exclusivity within its defined areas of supply. Granting trading licences to other entities to supply customers within these areas constitutes an infringement of Eskom's rights and an unlawful amendment of its licence without due process. Eskom relies, in this regard, on the policy underpinning the Distribution Rules, which prohibit two or more licensees supplying in the same area. Eskom further contends that NERSA has seemingly misunderstood the extent to which, and the purposes for which, Eskom relies on the Distribution Rules.

3. Cherry-picking of profitable customers: The potential for licensed traders to selectively target financially sound customers, such as large industrial users, threatens Eskom's ability to maintain a balanced tariff structure. This cherry-picking undermines cross-subsidization, wherein profits (surplus)

continues from page 51

from industrial customers support the provision of services to residential, indigent and small business customers, creating an imbalanced and unfair economic environment. This cherry-picking undermines the financial viability of Eskom's operations and the existing tariff structure that accommodates these cross-subsidies.

This "cherry-picking practice seemingly goes or can further, wherein some of these customers get targeted and incentivised by traders to be their service provider during certain Time-of-Use ('ToU") tariff periods. These traders can incentivise, offer lower prices, etc because they are "profit driven" and not regulated like Eskom and municipal electricity utilities who have service delivery mandate and not "profit driven".

4. Unfair competition: Eskom argues that private traders can operate more flexibly with their pricing than Eskom, because Eskom's tariffs are regulated and fixed for longer periods. This creates an uneven playing field where traders can unfairly compete by offering lower prices to select customers, without the broader public service obligations that Eskom carries.

Eskom asserts that private traders can exploit their flexibility in pricing, operating without the stringent regulatory constraints that govern Eskom's tariff structures. This dynamic leads to an uneven playing field, where private entities can undercut Eskom's prices without carrying the burden of public service obligations that Eskom must honour.

5. Lack of prior consultation: Eskom is gravely concerned about the consistent failure of NERSA to require the trading licence applicants consult with Eskom before submitting their applications to NERSA especially when these applications directly affect Eskom's licensed areas and customer base. This lack of engagement is an affront to the principle of natural justice, given Eskom's material interest in the applications. Eskom, for instance, has consulted with municipalities even for greenfield developments. NERSA is legally responsible for this lack of consultation because it should not have entertained the trading licence applications unless and until there was proper consultation with Eskom.

An important aspect of Eskom's objection is the failure of NERSA to effectively engage with Eskom before issuing trading licenses. The consultations are meant to ensure that all stakeholders, particularly those like Eskom that hold key operational roles, have a voice in decisions impacting the electricity supply landscape. The impact of these decisions extends beyond Eskom to municipal electricity utilities, which may also face significant operational challenges like Eskom should these licensed traders enter their territories in the context of the circumstances as described.

6. Impact on tariff recovery and subsidies: Eskom's tariff structure based on a bundled service of distribution and supply, with embedded subsidies. Allowing traders to supply the energy portion to customers without contributing to the overall costs and subsidies will negative impact Eskom's ability to recover its costs and fulfil its mandate, including universal electrification. The current electricity tariff structure in South Africa is not designed for multiple traders, particularly concerning the recovery of fixed costs and the socialisation of risk.

Granting trading licences without addressing these fundamental issues will lead to unintended consequences, contravene existing rules and licences, compromise the orderly development of electricity infrastructure or grid, and negatively impact the broader South African economy.

STRUCTURE AND FRAMEWORK: THE NECESSITY OF CONSULTATION

What Eskom seeks through its court challenge is not a monopoly on the electricity trading market but an effective fit- for-purpose framework that allows for consultation with and consent from all stakeholders involved. The legitimacy of trading licenses must be undergirded by a structured set of comprehensive and effective rules, transparent operational guidelines, and collaborative engagement among all market participants.

Eskom's position is clear: for competition to be fair, it needs to be effectively and efficiently regulated, and fair rules must apply across the board. The lack of effective regulatory clarity surrounding trading licenses not only impedes Eskom's operational mandate but could lead to chaos in the broader energy market. Rather than a free-for-all where some entities can operate with an unfair advantage, there must be equitable rules that govern how electricity is supplied and traded in South Africa.

THE REGULATORY LANDSCAPE AND FUTURE DIRECTIONS

As the South African energy landscape evolves, the need for a comprehensive effective regulatory framework becomes more critical. The latest amendments made to the Electricity Regulation Act 2024, specifically the change in Schedule 2 generators, reflect a shift towards stimulating investment and participation in the sector. Yet, this must be balanced against the obligations held by established entities like Eskom.

The increase in the licensing exemption threshold to beyond 100 MW for embedded generation has been a substantial step toward enabling greater participation by private generators.

However, this change must be coupled with robust regulations to ensure that established electricity utilities are not unduly compromised, particularly considering the existing tariff structure, which has been designed for a monopolistic delivery of electricity services.

It must be stated that for the avoidance of any doubt and misunderstanding Eskom and municipal electricity utilities unequivocally support fair competition; however, it is essential that this competition occurs on a level playing field where all participants adhere to the same regulations, standards and rules.

This fair competition regime must result in "winners and winners' outcomes" for all stakeholders participating in the said competitive value chain. It cannot result in potentially a zero-sum outcome with "winners and losers' outcomes". In this respect the author argues that Eskom and the municipalities will come out as losers. This is not merely about maintaining influence; it is about ensuring that the operational framework allows all players, including municipal utilities, to thrive and serve their customers effectively and efficiently.

What is required going forward is an effective and efficient recalibration of the regulatory framework that accommodates the realities of both existing players and new entrants into the market.

The trading rules by NERSA for the licensing of traders must therefore be developed with the effective engagement of Eskom and other stakeholders to ensure that the rules and/or guidelines not only promote competition but protect the viability of electricity supply within South Africa.

CONCLUSION

Eskom's legal challenge against NERSA constitutes a critical focal point for the future of electricity trading in South Africa. It underscores the necessity of a well-designed regulatory framework with associated effective rules that fosters fair competition whilst ensuring that the interests of all stakeholders—including consumers, established utilities like Eskom, and municipalities and new market entrants—are safeguarded.

In essence, a balanced approach to the energy market is not just a matter of regulatory compliance; it is about ensuring that South Africa's foundation for growth, stability, and fairness within the energy sector remains intact.

As Eskom and municipal electricity utilities navigate these turbulent waters, the commitment to a democratic process and a rules-based economy will serve as a guiding principle in the quest for a sustainable and equitable electricity market.

Eskom and the municipal electricity utilities support and are committed in fair play and a competitive environment, but fairness must be distinctively defined and guaranteed through comprehensive, well-considered regulations and rules that underpin any evolving competition in the electricity sector.

This legal battle serves not only Eskom but also the municipalities and, by extension, the consumers, illustrating the intricate balance necessary for a thriving South African economy. wn

Why Indigenous Knowledge Systems and African Traditional Medicines are essential, and the need for collaboration with engineering

Indigenous Knowledge Systems (IKS) are a deep repository of knowledge, practices, and skills developed by local communities over centuries, often through a close relationship with their environment.

By: Dr. Phetole Mahasha
Research and Innovation Associate
Department of Pharmaceutical Sciences
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While traditionally rooted in areas like healthcare and agriculture, IKS represents a valuable, systems-based approach to problem-solving that holds significant potential for modern engineering. This article explores how engineers from various disciplines—particularly electrical engineering—can collaborate with and learn from IKS to create innovative, sustainable, and culturally appropriate solutions.

INDIGENOUS KNOWLEDGE AS A FOUNDATIONAL SCIENCE

IKS is more than just a collection of cultural artefacts; it's a form of applied science built on empirical observation and generations of iterative refinement. For example, African Traditional Medicines (ATMs) are based on a deep understanding of botany, chemistry, and human physiology. The use of plants like Artemisia afra for respiratory ailments or Sutherlandia frutescens for immune support reflects an intricate knowledge of natural compounds and their effects. From an engineering perspective, this represents a massive, pre-vetted database of potential solutions:

Materials Engineering: Indigenous communities have long used natural materials with specific properties. Traditional building techniques and tools, for instance, are often optimised for local climate and resource availability. Engineers can study these structures to inform the design of low-cost, sustainable, and resilient materials. The use of certain plant fibres for ropes or specific clays for pottery can provide insights into novel composites and ceramics.

Biological Engineering: The practice of ATMs is a form of biological engineering. Traditional healers understand plant life cycles, extraction methods, and dosages. Engineers can collaborate with traditional practitioners to apply modern analytical techniques like spectroscopy and chromatography to isolate active compounds. This synergy can accelerate drug discovery and the development of new Nutraceuticals, creating economic opportunities for communities while validating traditional knowledge.

SYNERGIES WITH ELECTRICAL AND OTHER ENGINEERING DISCIPLINES

The intersection of IKS, ATMs, and engineering (Figure 1) is a rich field for innovation, particularly for electrical engineering.

ELECTRICAL ENGINEERING AND DIAGNOSTICS

Instrumentation: Traditional healers often use pulse diagnosis and other physical examinations to assess a patient's health. Electrical engineers can develop non-invasive, low-power diagnostic tools that are affordable and user-friendly for remote or rural settings. Imagine a handheld device that measures heart rate variability, skin conductivity, or even detects subtle changes in biological signals that a traditional healer can then interpret alongside their own observations. This could bridge the gap between traditional and modern medicine, providing objective data to support a diagnosis.

Energy and Communication: Many rural communities lack reliable electricity, which limits access to modern medical equipment and information. Electrical engineers can design off-grid solar and micro-grid systems tailored to the energy needs of clinics and traditional medicine practices. This enables the use of digital patient records, tele-consultations, and the powering of small-scale laboratory equipment for validating traditional remedies. Furthermore, developing robust, low-bandwidth communication networks can facilitate knowledge sharing between traditional healers and researchers.

CHEMICAL AND INDUSTRIAL ENGINEERING

Sustainable Production: Chemical engineers can work with indigenous communities to develop scalable, sustainable processes for extracting and purifying active compounds from medicinal plants. This moves beyond small-batch, traditional preparation to industrial-scale production. This includes designing efficient, low-energy separation processes and ensuring the final products meet safety and quality standards, which is crucial for market access.

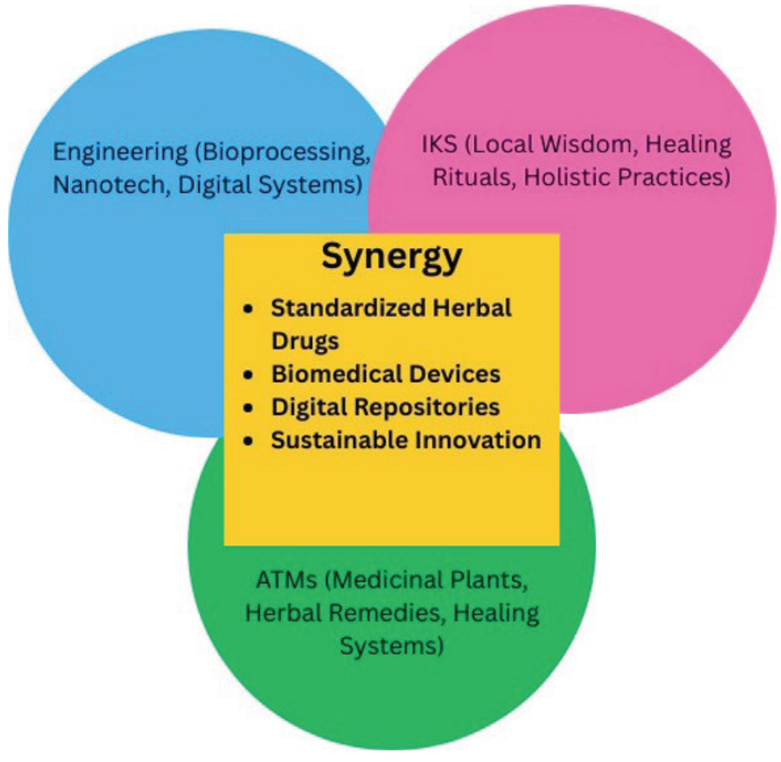


Figure 1: Synergy between IKS, ATMs and Engineering.

CIVIL AND ENVIRONMENTAL ENGINEERING

Water and Sanitation: Indigenous communities often have sophisticated knowledge of local water sources and water management. Civil and environmental engineers can integrate this traditional wisdom—such as using specific plants for water purification or understanding groundwater flow in a particular topography— into modern sanitation and water treatment projects. This collaboration can lead to more resilient and culturally acceptable water solutions, reducing public health risks.

BRIDGING THE DIVIDE: A CALL TO ACTION FOR ENGINEERS

The challenges of integrating IKS into mainstream practice—such as a lack

continues from page 55

of formal validation and intellectual property concerns—are solvable through a collaborative engineering approach.

Interdisciplinary Teams: Engineers should work with anthropologists, botanists, traditional healers, and policymakers. A multi-stakeholder approach ensures that technological solutions are not only practical but also culturally sensitive and respectful of traditional knowledge ownership.

Intellectual Property (IP) Protection: Engineers can help design systems for documenting and protecting traditional knowledge. Blockchain technology, for example, could be used to create an immutable record of a community's intellectual property, ensuring that they receive fair compensation for their contributions to new products.

Education: Engineering curricula should include modules on IKS, emphasising the importance of cross-cultural collaboration and ethical considerations. By embedding this perspective early, we can train a new generation of engineers who view indigenous knowledge not as a relic of the past but as a source of contemporary innovation.

Engineering provides tools to scale, validate and integrate traditional medicines into modern health and economic systems, while IKS provides holistic and raw wisdom approaches. Together, they can drive health equity, innovation, and sustainable development.

By leveraging the rich biodiversity and time-tested knowledge of indigenous communities, Africa can not only improve health outcomes but also drive economic growth and job creation, much like other resource-rich regions have done.

Engineering holds the key to unlocking this potential, translating traditional wisdom into tangible, scalable, and sustainable solutions. wn

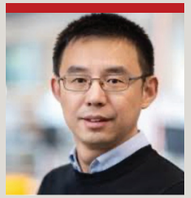
IEEE SPEC 2025 (the 10th Southern Power Electronics Conference) will take place in Johannesburg, South Africa, from December 1 to 4, 2025. SPEC 2025 offers a valuable opportunity for researchers, engineers, academics, and students worldwide to showcase the latest technological advances and applications in Power Electronics to the Southern Hemisphere.

Mark **Dehong Xu**

Dr Xu has authored ten books and over 200 papers, holds more than 40 patents, and his research focuses on power electronics, renewable energy, and energy efficiency.

Frede **Blaabjerg**

Dr Blaabjerg's research focuses on power electronics applications, reliability, harmonics, and adjustable-speed drives.



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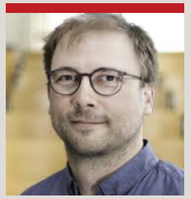
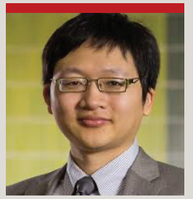
Changfu **Zou**

Dr Zou is currently an Associate Professor. His research interests include advanced modelling and automatic control of energy storage systems, and particularly batteries.



Andreas **Liske**

Dr Liske's research focuses on modelling, control and condition monitoring of electrical drives and power electronics.



Minjie **Chen**

Dr Chen has received several accolades and holds three issued patents and has several patents pending.

Günter **Keller**

Dr Keller has instructed over 70 industrial and university workshops and seminars worldwide, as well as more than 10 conference workshops and tutorials globally.

Petar **Grbović**

Dr Grbović's research focuses on advanced energy storage devices, power converter topologies, and control of power converters.

IEEE SPEC 2025

OPINION

The South African government must mandate smart geysers to support the Just Energy Transition

With South Africa enjoying a reprieve from loadshedding, now is the time to act swiftly to secure the country's long-term energy stability. One of the most effective yet underutilised solutions is the widespread adoption of smart geysers. The only way to gain the full benefit of this measure is to ensure compliance through legislative action that mandates the adoption of smart geysers.

"This could not be more urgent, as Eskom is currently spending billions of rands on diesel to keep the lights on, a stop-gap measure flagged by the Minerals Council South Africa's July 2025 electricity update as unsustainable. Economist André Lourens has warned that this reliance will inevitably come back to consumers in the form of steeper electricity tariffs in the years ahead, further squeezing households and businesses already under financial strain," shares Mark Allewell, CEO at Sensor Networks.

Taking decisive action today is supported by the necessary data. Early in his tenure as Minister of Electricity, Dr Kgosientso Ramokgopa indicated that simply switching off geysers when not in use could save up to 4,000MW – the equivalent of four stages of loadshedding. Smart geysers make this not only possible, but automatic, unlocking consistent national savings without the economic and environmental cost of burning diesel.

Geysers are among the biggest consumers of electricity in the residential sector, accounting for up to 50% of household usage. The introduction of smart geysers would therefore not only reduce the likelihood of returning to load shedding, but also lower consumers' electricity bills at a time when the high cost of living is a key concern for many families.

Smart geysers enable users to schedule or remotely control water heating, thereby reducing unnecessary consumption and alleviating pressure on the national grid. "If we mandated smart geysers in all formal households - backed by government-funded installation in lower-income homes - the economic benefits would be massive," said Allewell. "An estimated R85 billion investment in smart geysers is far cheaper than the R481 billion lost to the economy due to load-shedding in 2024 alone."

Critically, the systems to implement such a mandate already exist in South Africa. "Local insurance companies are already replacing more than 10,000 geysers in the country every month", added Wayne Vertue, Country Director at Ariston Group South Africa, a local manufacturer of renewable and high-efficiency solutions. "Because the government mandated a new standard for geysers in 2017, the country has developed the skills and know-how to implement a systematic approach to widespread geyser replacements. Effecting a similar process for the installation of smart geysers would rapidly increase demand for smart geysers, with positive effects for local manufacturing capacity and employment."

The mandate would also support South Africa's climate commitments and Just Energy Transition goals, making it a win-win-win proposition for the country.

"With the right support, South Africa could lead the world in pioneering this simple but powerful energy intervention," said Allewell. "The time to act is now." wn

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OPINION

Building Namibia's renewable energy future through skills development in green hydrogen

Namibia's aim to become a world leader in green hydrogen is accelerating, with major projects planned for the Kharas Region and other high-resource areas. The country's abundant sunshine, strong coastal winds, and strategic export position have already attracted international investment, particularly around Lüderitz, where large-scale renewable energy developments are taking shape.

By Julien Karambua
Country Manager
Workforce Staffing Namibia

Yet the true measure of success will not be the megawatts produced or tonnes of hydrogen exported; it will be whether Namibians themselves are at the centre of building and running this industry. Achieving that means rapidly equipping the local workforce with the right skills, certifications, and experience to meet global standards.

MORE THAN ENERGY, IT'S A DRIVER OF ECONOMIC TRANSFORMATION

Green hydrogen is more than a power generation solution. It's Namibia's chance to diversify its economy, reduce reliance on imported electricity, and stimulate growth across logistics, manufacturing, and services. Large-scale projects have the potential to create long-term, high-value jobs across multiple sectors, supporting the country's industrialisation ambitions.

Lüderitz, in the Kharas Region, is a focal point for these developments. The area benefits from exceptional wind conditions, high solar potential, and access to port infrastructure. While cultural heritage considerations at Lüderitz harbour, particularly at Shark Island, have influenced export planning, alternative routes through South Africa are being explored.

CREATING SUSTAINABLE JOBS ACROSS THE VALUE CHAIN

Renewable energy developments require a range of roles across different project stages. During construction, demand spans project and construction managers, artisans, civil engineers, scaffolders, and safety officers. Once operational, plants will rely on technicians, mechanical and electrical engineers, logistics coordinators, and operations and maintenance specialists.

Although many of these skills already exist in Namibia, international project standards mean that workers must hold recognised qualifications. This creates a critical need for certification and upskilling to ensure that local workers meet global compliance requirements.

CERTIFICATION AS THE KEY SKILLS GAP

In most cases, Namibia's challenge is not the absence of core skills but the lack of certification aligned with international benchmarks. Tradespeople such as welders and riggers may be highly experienced, but without Red Seal or equivalent qualifications, they cannot fully participate in large-scale green hydrogen projects.

Recognising this, training providers, the government, and industry are collaborating to close the gap, with Technical and Vocational Education and Training (TVET) centres in the Kharas Region delivering targeted programmes that combine theoretical instruction with practical certification, in conjunction with the private sector.

COORDINATED NATIONAL EFFORT

Namibia's government is taking steps to encourage local workforce development through incentives offered by the Namibia Training Authority (NTA) to companies that train and employ

Namibians. Industry partners are expanding internship and apprenticeship opportunities to provide young people with exposure to real-world project environments. Recruitment drives focus on teaching youth from local communities to ensure the benefits are rooted in the local community.

Bridge training programmes, designed with industry input, are providing project-specific certifications, including those in hydrogen safety. Additionally, on-site internships and shadowing opportunities are accelerating practical learning. International training exchanges are also enabling Namibians to study and work abroad in similar industries, gaining valuable expertise before returning home. Together, these measures aim to create a continuous skills pipeline that supports current and future renewable energy projects while strengthening the national labour market.

WHY SKILLS ALIGNMENT MATTERS

Without alignment between energy investments and workforce readiness, Namibia risks building a world-class green hydrogen sector operated predominantly by external labour. This would limit local economic benefits and slow skills transfer.

Integrating skills development from the outset ensures that projects can be delivered on time and on budget, while also building sustainable employment in communities near project sites. Local participation strengthens social support for projects, fosters a sense of national ownership, and enhances the industry's long-term stability.

Stakeholder engagement is essential to ensure that the benefits of renewable energy projects are widely shared. This includes working closely with local communities to align project goals with regional priorities, address potential concerns, and maximise opportunities for participation. Strong community involvement helps to embed projects into the local economic and social fabric, creating lasting value beyond the construction phase.

A people-centred clean energy transition Namibia's solar and wind resources offer a powerful foundation for renewable energy, but realising the full potential of green hydrogen requires a focus on people as well as technology. Success depends on positioning green hydrogen as a people-centred project, integrating skills development into the country's energy independence plans, and growing local employment opportunities in step with infrastructure investments.

When workforce development keeps pace with these projects, Namibia can achieve sustainable energy independence and foster broad-based economic growth. wn

OPINION

Bad Weather

- MINES SHOULD REVISIT THEIR DEWATERING STRATEGIES

Extreme weather events are becoming more prominent, prompting mines to expand their insurance coverage and improve mitigation strategies such as dewatering.

By: Chetan Mistry
Strategy and Marketing Manager
OEM Xylem Africa's

The debate around climate change has never been hotter, and the reality of changing weather patterns is evident through extreme and unexpected storm events. These events have a particular impact on mines, which can suffer various disruptions as a result.

A succession of tropical storms that hit Australia in late 2023 reduced the country's gold output by 9%. In early March 2024, Glencore's McArthur River zinc and lead mine had to stop operations due to heavy rainfall. Even the Democratic Republic of Congo, an area accustomed to heavy rainfall, isn't spared: in 2023, Alphamin Resources lowered its guidance for its DRC mines due to persistent rains.

A GROWING RISK

These events are becoming more. According to a study by risk intelligence firm Verisk Maplecroft, heavy rainfall is expected to threaten a quarter of global copper production by 2050.

Insurers are weighing in on the topic. Lockton's 2025 mining insurance market report paints an upbeat picture for the sector this year. However, extreme weather is one of the exceptions, noting that "extreme weather events such as floods and droughts, and natural catastrophes like tropical cyclones, are major causes of disruption in the mining sector."

Mines are urged to look more closely at parametric insurance, a type of natural disaster coverage that, until now, has not been a major priority among mines. The report predicts that mining insurance claims are expected to increase as weather patterns shift and the criteria for insurance coverage rise—especially for floods and risks associated with tailing dams.

"Mining is a tough business, and mining operations know how to roll with the punches," says Chetan Mistry, water technology OEM Xylem Africa's Strategy and Marketing Manager. "But they are battling bigger and more unpredictable storms, which can create many problems on a site, such as dams bursting, tunnels flooding, and water washing away infrastructure such as roads and bridges."

MITIGATING FLOOD RISKS WITH DEWATERING

Insurance has inherent risks, including more stringent requirements for policyholders. Policies also only pay out after a mine has suffered losses, and recovering from floods can take weeks to months. Even if a mine has an ironclad policy, that won't stop share prices from dropping when it reduces projections. This happened to Gold Fields, which in 2024 lowered its annual gold production forecast after bad weather impacted its Salares Norte mine in Chile, leading to an 8% drop in its share price.

But mines can do more to reduce extreme weather risks, such as adjusting their dewatering strategies. Dewatering is a routine mining operation, as old as digging into the planet to unearth its resources. Ancient miners used buckets, and dewatering has inspired innovations such as the Archimedes screw and steam engine pumps. Today, mines routinely use powerful dewatering infrastructure. Yet, this familiarity might also blindside them, says Mistry:

"Mines often have permanent dewatering solutions installed. However, these are typically designed for past conditions, not the types of weather events that occur today. Extreme weather doesn't always mean a massive storm. It often means more frequent storms, which place additional pressure on dewatering systems or create flooding conditions outside of their scope."

Mines can test and adjust their dewatering strategies to include the newer risks:

- Portable dewatering systems that can be transported in light vehicles or attached to mining rigs for quick and straightforward access.
- Rental fleet contracts to rapidly deploy heavy dewatering equipment.
- Modern dewatering pumps can operate remotely and are more resilient against pressure changes and snoring.
- Upgrades to existing dewatering pumps to improve resilience while also reducing maintenance costs.
- Rapid dewatering plans are arranged with service providers.

This is an opportune moment to re-examine dewatering strategies. New generations of pumps, membranes, impellers, and control systems have enhanced the ability of dewatering technologies to handle harsher conditions, larger solids, and chemicals that can erode materials. Such improvements also improve workers' safety.

Nobody can control the weather. But they can manage the disruptions caused by more rainfall. Dewatering is one of the best ways mines can maintain high output even when the market is unstable. wn

OPINION

Putting people at the heart of South African mining's renewable energy transition

Mining companies are investing heavily in renewable energy, but technology alone cannot guarantee the success of these projects.

By Donné Nieman
Sales Director
Workforce Staffing

The critical factor is having the right people in the right roles for the right amount of time. Temporary Employment Solutions (TES) providers can help mining operations turn their ambitious ESG goals into reality with a Human-Centric Solutions (HCS) approach. By carefully matching employees to roles where their skills and experience have the most significant impact, while also providing support and development, human-centric solutions ensure projects are delivered efficiently, sustainably and in full compliance with labour laws, safety standards, and ESG commitments.

THE ROLE OF HUMAN-CENTRIC SOLUTIONS

Human-centric solutions bridge the gap between a mining operation's workforce needs and its renewable energy project goals. Forward-thinking TES providers work as strategic partners to mining organisations, handling the end-to-end workforce process - from sourcing and vetting the right skills, through to ensuring they have the necessary training, certifications, and resources to perform effectively.

In assuming responsibility for recruitment, compliance with labour regulations, contract management, payroll, and employee support, the TES provider frees the mining organisation to focus on core project delivery. A human-centric approach ensures that staff are not only technically competent but also aligned with the operation's ESG commitments. This includes providing access to benefits such as medical aid, provident funds, and skills development - benefits that create stability and encourage commitment, even in project-based or fixed-term work.

SUPPORTING RENEWABLE ENERGY GOALS

Employees are onboarded to understand both their immediate role and the broader purpose of the project, whether it is reducing the mine's carbon footprint or meeting local content targets. The alignment of workforce readiness with project timelines and goals by the TES provider enables mining clients to scale their teams during construction phases and retain essential expertise for the ongoing operations and maintenance stages. With the right people in place—supported, skilled, and motivated—ambitious, large-scale renewable energy transitions become achievable.

Meeting renewable energy objectives and lowering a mining operation's carbon footprint requires a workforce that is both capable and conscious of its impact. TES providers taking a human-centric approach will ensure that employees are competent, integrated into project teams, and recruited locally whenever possible, in support of community development and ESG commitments.

Where local skills are limited, a human-centric approach involves upskilling and training initiatives that equip community members for specific roles. This addresses immediate project needs while also developing a pipeline of skilled workers for the future.

Employees are encouraged to see how their daily work contributes to environmental and social outcomes, ensuring that renewable energy projects are delivered efficiently, safely, and sustainably.

COMPLIANCE AND RISK MANAGEMENT

In the renewable energy project-based environment, proactive compliance is essential. A skilled TES partner integrates systems that ensure every stage of recruitment, onboarding and workforce management aligns with labour laws, site regulations and company policies. This protects the mining organisation against legal penalties, disputes and reputational damage.

A well-supported and compliant workforce provides mining companies with the assurance to operate without unnecessary risk.

Employees are aware of the standards expected of them, while TES providers monitor and address issues before they escalate. With compliance embedded into daily operations, risks are mitigated early, projects run smoothly, and the company's reputation remains intact.

ENHANCING OPERATIONAL EFFICIENCY AND SUSTAINABILITY

TES providers utilise human-centric solutions to enable mining operations to work smarter and more sustainably. Given that engaged, skilled, and supported employees are more productive, reliable, and motivated, this boosts project delivery and generates a positive social impact in the communities where mining takes place.

Human-centric solutions show that people are at the heart of both business performance and sustainability. A well-prepared, engaged workforce keeps projects on schedule, meets ESG targets, and upholds safety and compliance standards.

Technology alone cannot achieve this - it is the right people, fully supported, who turn renewable energy goals into lasting results.

OPINION

Why Sustainability and Resilience matter more than ever to navigate the ESG backlash

We are at a pivotal moment in the evolution of the global sustainability agenda. ESG (Environmental, Social and Governance), once heralded as a pragmatic framework for embedding long-term resilience into business, is now facing growing resistance. It is under scrutiny from both political and cultural fronts, particularly in markets that were previously considered ESG frontrunners.

By Stephan Jooste
Managing Director
Sustainability, Africa, Zutari

In this climate, I often find myself returning to the core purpose behind Sustainability of creating long-term value in a world of escalating uncertainty. The backlash we are seeing may appear reactionary, but it should not distract us from the facts. Climate volatility is increasing. Resource scarcity is deepening. Social equity remains unresolved. These are not ideological constructs; they are tangible, measurable forces shaping our world.

The recently released Sustainability at a Crossroad 2025 report, developed by GlobeScan, ERM, and Volans, confirms the shifting tides. Based on insights from 844 sustainability experts across 72 countries, the survey highlights a sobering truth: over 90% of experts believe the current sustainability approach requires revision, with more than half calling for a radical overhaul. Most respondents from Europe, the Middle East, and Africa are particularly critical of progress to date. Fewer than one in ten believe our efforts have been "excellent".

Even more striking is that seven in ten experts now report significant backlash against sustainability agendas in their countries, a 13 percentage point increase from 2024. These are not mere outliers; this represents a global pattern. But backlash, however noisy, is not the same as obsolescence. In fact, it often signals that the work is beginning to hit a nerve, disrupting entrenched norms, assumptions, and interests.

A SHIFTING LANDSCAPE

The past six months have seen a flurry of changes from Securities and Exchange Commission (SEC) rollbacks in the US to political resistance in the EU, a regulatory freeze in the UK, policy slowdowns in Australia, and mixed signals from emerging markets. Companies are reacting in various ways, with some dropping ESG language altogether, while others maintain sustainability commitments but keep them private.

What this tells us is that, even amidst reputational risk and political pushback, there is a persistent, underlying drive for sustainable action, whether that be out of obligation, transaction, or deep conviction. This moment of tension is also a moment of truth. Investor concerns and regulatory compliance have dominated the ESG narrative.

As a result, it has often failed to capture the imagination or trust of workers, customers, and communities. The legitimacy crisis is real—but it is not inevitable. If Sustainability is to remain relevant, it must be embedded in a business's purpose, not just its branding.

HOW DO WE MOVE FORWARD?

At Zutari, we believe that navigating ESG whiplash requires a recalibration, not a retreat. Here is what I have learned from working with clients across the continent:

Embed Sustainability where it matters: Go beyond reporting and embed sustainable thinking into product development, operations, talent strategies, and capital allocation. This is not box-ticking. It is value creation.

Be honest about trade-offs: Sustainability will not always be easy, or instantly profitable. But the alternative of short-termism is far riskier. The decisions made today will define our resilience tomorrow.

Build broad coalitions: True Sustainability cannot be imposed from the top down. It must engage employees, customers, suppliers, and the communities where businesses operate. That is how legitimacy is earned, and impact is amplified.

We are not naïve about the challenges ahead. The 'Sustainability at a Crossroads' report finds that more than half of experts believe current global shocks, from economic to political and environmental, are a threat to Sustainability.

Governments, in particular, are perceived to be lagging. Yet, the report also highlights a critical insight: there is still momentum in the corporate sector and civil society to drive real change. Mechanisms such as green bonds, circular economy models, and integrated sustainability strategies are viewed as high-impact levers for transformation.

It is encouraging to see that academic and research institutions are gaining credibility as trusted sources of innovation. As engineers, planners, and advisors, we at Zutari share this responsibility. We bring rigour, systems thinking, and a deep commitment to co-creating solutions that are locally grounded and globally relevant.

As Dr Ioannis Ioannou of London Business School aptly puts it: "The backlash will eventually subside. What will endure are the decisions made in this moment – what to prioritise, what to safeguard, and what principles to uphold."

We are truly at a crossroads. Those who take a long view, resist the noise, and stay true to the purpose of Sustainability will not only build resilience but also unlock new opportunities for innovation, inclusion, and growth. Let us not be deterred by the backlash. Let us lead through it because the future is not ESG or not ESG. The future is resilience – and resilience demands leadership. wn

MEMBERSHIP FEES EFFECTIVE 1 DECEMBER 2024

The Council meeting held on 6 September 2024 approved subscription & entrance fees as from 01 December 2024 as per schedule indicated below.

PLEASE NOTE: In terms of Bylaw 3.2 annual subscriptions are due on 1st December 2024

MEMBERSHIP FEES CAN BE PAID IN MONTHLY RECURRING PAYMENTS

Council agreed to a discount for fees paid before 31 March 2025. Members are therefore encouraged to pay promptly to minimize increase impact.

Grade of Membership	Annual Subscriptions paid before 31 March 2025		Annual Subscriptions paid after 31 March 2025		New Members FEES * see Notes 1 & 4 below.	
	RSA incl VAT (R)	Outside RSA excl VAT (R)	RSA incl VAT (R)	Outside RSA excl VAT (R)	RSA incl VAT (R)	Outside RSA excl VAT (R)
Student	nil	nil	nil	nil	nil	nil
After 6 yrs study	1 890	1 644	2 268	1 972	2 268	1 972
Associate	1 890	1 643	2 268	1 972	2 268	1 972
Member	2 089	1 816	2 507	2 180	2 507	2 180
after 6 years	2 441	2 122	2 929	2 547	2 929	2 547
after 10 years	2 555	2 221	3 065	2 666	3 065	2 666
Senior Member	2 555	2 221	3 065	2 666	3 065	2 666
after 6yrs/age 40	2 768	2 407	3 322	2 889	3 322	2 889
Fellow	2 768	2 407	3 322	2 889	3 322	2 889
Retired Member (By-law B3.7.1)	1 174	1 021	1 409	1 225	n/a	n/a
Retired Member (By-law B3.7.3)	nil	nil	nil	nil	n/a	n/a

1. The fee for all new applications is R3457.00 which includes an entrance fee of R950.00. On election to the applicable grade of membership the new member's account will be adjusted accordingly and refunds/additional payment made on request.

2. Transfer fee to a higher grade is free for all grades of membership.

3. Members are encouraged to transfer to a higher grade when they qualify. It will be noted that the fees of Member and Senior Member grades after 10 and 6 years respectively are equal to the fees at the next higher grade.

4. Members elected after May 2025 pay a reduced subscription fee.

5. By-law B3.7.1 reads “Where a member in the age group of 55 to 70 years has retired from substantive employment in the engineering profession, such member may make written application to Council for recognition as a retired person and a reduced membership fee".

6. By-law B3.7.3 reads “any member complying with the conditions of B3.7.1 but who has been a member of the Institute for not less than 25 consecutive years, shall be exempt from the payment of further subscriptions.” Members who comply with the requirements of By-Law B3.7.3 may make written application to Council for exemption from paying subscriptions".

7. By-law B3.9 reads “any member in good standing who has been a member for fifty (50) consecutive years shall be exempt from the payment of further subscriptions.”

8. Members not in good standing by failing to pay their subscriptions by end of June of each year will, subject to Council decree, be struck-off the SAIEE membership role.

9. Members in good standing and no longer in substantive employment and do not receive payment or salary for work done may apply to Council for a reduction in their annual subscriptions.

10. The members monthly magazine ("wattnow") is available on line and members who require a hard copy may acquire same on request and for a nominal fee subject to minimum uptake numbers.

11. Members who wish to pay their membership fees in recurring payments should activate the payments on their banking portal. Members will receive the early bird discount only if their fees are fully paid by 31 March 2025.

SAIEE

2025 SAIEE MEMBER BENEFITS

STUDENT MEMBER	ASSOCIATE MEMBER	MEMBER	SENIOR MEMBER	FELLOW
Jobs portal for WIL	Jobs portal access	Jobs portal access	Jobs portal access	Jobs portal access
Mentorship	Mentorship	Mentorship	Services Directory	Services Directory
Exclusive Networking Events	Exclusive Networking Events	Exclusive Networking Events	Mentorship	Mentorship
CPD training discounts	CPD training discounts	CPD training discounts	Exclusive Networking Events	Exclusive Networking Events
Charge Reward Programme earnings	Charge Reward Programme earnings	Charge Reward Programme earnings	CPD training discounts	CPD training discounts
Bursary programme	Bursary programme	Long standing member gifts	Charge Reward Programme earnings	Charge Reward Programme earnings
Publication access (**watt**now & ARJ)	Publication access (**watt**now & ARJ)	Bursary programme	Long standing member gifts	Long standing member gifts
Site visits	Site visits	Publication access (**watt**now & ARJ)	Bursary programme	Bursary programme
SAIEE Centres	SAIEE Centres	Site visits	Publication access (**watt**now & ARJ)	Publication access (**watt**now & ARJ)
		SAIEE Centres	Site visits	Site visits
			SAIEE Centres	SAIEE Centres
			Eligibility for nomination as Center Chair	Eligibility for nomination as Center Chair
				Eligibility for nomination as an Office Bearer

MEMBERSHIP UPGRADE DISCOUNT STRUCTURE

LENGTH OF MEMBERSHIP	DISCOUNT UPON UPGRADE
10 - 19 years	5%
20 -39 years	10%
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03/09/2025	Arc Flash
03/09/2025	An Introduction to Artificial Intelligence for Professionals
05/09/2025	Road to Registration for Engineering Candidates
06/09/2025	Gauteng Centre presents: Brew & Trek | Hiking Event
10/09/2025	Incident Investigation and Management (Root Cause Analysis)
10/09/2025	KZN Centre presents: Unlocking South Africa's Potential
16/09/2025	Fundamentals of Medium Voltage Protection
16/09/2025	Planning Feasibility Studies: An Engineer's Perspective
18/09/2025	74th Bernard Price Memorial Lecture | Wits University
25/09/2025	High Voltage Measurement and Testing
29/09/2025	FIDIC Tendering and Contracts for Engineers

OCTOBER 2025

01/10/2025	Smarter Mobility Africa Summit
07/10/2025	Power Systems Protection
15/10/2025	Photovoltaic Solar Systems - Gqheberha
21/10/2025	Hack Lab
22/10/2025	High Voltage & Engineering Conference
23/10/20205	Legal Liability: Mine Health and Safety Act
28/10/2025	SANS 10142-1 Edition 3.2 2020
30/10/2025	Technical Report Writing
30/10/2025	New Engineering Contract (NEC)

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