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Peter Middleton

Sustainability and South Africa's competitiveness

COMMENT



At the time of writing, the UN's COP30 climate summit is underway in Belém, Brazil, in the heart of the Amazon rainforest. The focus is said to be 'turning words into action', with an urgent push for climate adaptation: through updated Nationally Determined Contributions (NDCs), the climate action commitments made by individual countries under the Paris Agreement; finding a way to 'unlock' \$1.3-trillion of climate finance to steer the planet clear of a 1.5°C rise in average global temperature; and a renewed focus on ending rainforest loss.

I find it difficult to feel optimistic about the outcomes. In the words of the COP30 summit president, André Aranha Corrêa do Lago, Brazil is "at the epicentre of the climate crisis." At COP26 four years ago, over 140 countries pledged to halt and reverse deforestation by 2030, but global forest loss reached record highs in 2024. In the same year, the average global temperature was recorded at 15.10°C, exceeding the pre-industrial average temperature level (13.68°C) by 1.6°C, thereby breaching the 1.5°C target for the first time. That surely indicates that the 2050 target is likely to be impossible to meet.

Brazilian summit president Corrêa do Lago is calling for an end to the "hedging and handwringing" that has characterised the past few summits. The US's withdrawal from the Paris Agreement, however, is likely to make meeting the \$1.3-trillion climate finance goal difficult to reach, and it raises a further risk of a domino effect across the globe, where countries increasingly renege on their climate commitments or delay their NDC submissions.

Either way, COP30 will be a pivotal moment for the climate summit: an opportunity to set in motion the kind of climate action and justice the world needs to see, or another complete failure of international diplomacy that leaves the planet facing increasing levels of peril and questioning the political will of this generation of leaders to do anything about it.

From an industry and technology perspective, however, there are many more positive signs of progress and compelling reasons for transitioning to a low-carbon economy.

In the cover story for this issue, we talk to the director of the CSIR's National Cleaner Production Centre-South Africa (NCPC-SA), Ndivhuho Raphulu. With respect to the EU's Carbon Border Adjustment Mechanism (CBAM), which puts a carbon price on goods imported into the EU to prevent 'carbon leakage', Raphulu says the policy is encouraging South African industry to adopt production methods that

mitigate carbon emissions and implement climate adaptation technologies. "This also supports localisation, research and development, innovation, skills development and capacity building in our country."

Regarding the adoption of PV Solar technology in South Africa, he notes that government incentives, such as the VAT write-off process, have resulted in many households installing solar PV on their roofs, creating a new economic activity for rooftop solar PV installers in South Africa, while also reducing our dependence on coal. As a result, PV Solar is now much more affordable than it was.

In an article by Amith Singh, National Manager for Manufacturing at Nedbank Commercial Banking, he argues that the competitiveness of the manufacturing sector in South Africa now depends not only on cost, quality and delivery, but also on a fourth metric: carbon. Embedded emissions in every product exported to Europe now carry a tangible financial cost. Yet despite the price signals, many firms still lack the systems to measure carbon reduction progress.

Highlighting the Nedbank-NAACAM Carbon Readiness Study, he notes that a leading Tier 1 automotive supplier has recently become the first in South Africa to trial low-carbon steel in production, thereby reducing embedded emissions to align with international buyer expectations and strengthen its export market position. Their example shows that carbon readiness is not a compliance burden but a competitive advantage.

Also responding to the Carbon Readiness Study, Renai Moothilal, CEO of NAACAM, says that the pressure to decarbonise is coming less from government regulation and more from supply chain expectations. "Buyers are expecting suppliers to measure and report their emissions and to demonstrate progress on reducing their environmental impact, while lenders and institutional investors are channelling funds towards companies with robust sustainability plans," he says.

In this context, carbon performance is no longer a niche compliance concern but is fast becoming a critical factor in maintaining and growing market share.

These and many other signs suggest that transitioning to a cleaner and less carbon-intensive economy may no longer depend on the success of the endless round of fragile commitments made at the UN's annual COP summits. The modern technologies involved have a positive impact on lifestyles, the global economy, and the future of the planet, and they are becoming increasingly preferable and affordable.



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NCPC-SA's critical role in decarbonising SA

MCA talks to the director of the CSIR's National Cleaner Production Centre South Africa (NCPC-SA) about the role it plays in supporting industrial production facilities in mitigating climate change.



Industrial spaces have significant potential to produce energy for their own consumption and to serve nearby communities, as well as to provide greener infrastructure for industrial companies of all sizes.

With a mission to facilitate the transition of South African industry to a low-carbon, climate-resilient economy, the National Cleaner Production Centre South Africa (NCPC-SA) undertakes projects to help industrial facilities adapt and mitigate against climate change: by adopting circular economy principles; establishing sustainable industrial parks with tenants that are energy-efficient, resource-efficient and competitive; developing the skills and resources needed to implement renewable energy and green hydrogen projects; helping production facilities with the development of viable business cases for off-grid and local renewable energy plants; and encouraging industrial symbiosis, where companies identify and exchange each other's waste as alternative and circular raw-material resources.

"While I think people in industry are exhausted by the complex set of decisions they are being asked to make to comply with environmental legislation and global developments such as trade tariffs and carbon taxes, the uncertainty also presents opportunities to make a positive impact for the future. We exist to help companies

navigate compliance and take advantage of greener opportunities," begins Ndivhuho Raphulu, the Director of the NCPC-SA.

"The US tariffs, for example, have made industry realise we have a market at our back door, as well as significant unexploited opportunities in the Asian and the South American markets. Our industry and manufacturing clusters are now reaching out to these communities to foster stronger ties," he tells MCA.

Ndivhuho Raphulu has been involved with the NCPC-SA since 2006, having initially been brought in following an enquiry during Thabo Mbeki's time as President into the challenges to industrial growth in South Africa. "The key issues that emerged were industrial efficiency, competitiveness and environmental challenges. This programme was established at the Council for Scientific and Industrial Research (CSIR) to enable industry to address these challenges, with an initial mandate to raise awareness of regulations and opportunities that lie in cleaner production, introducing international best practices in South Africa.

"We quickly realised there was a critical skills and capacity problem, so we started

introducing what we now call green skills. Then, from an efficiency perspective, we began to do significant work in industrial energy efficiency, initially driven by constrained energy supplies and load shedding. Today, we have divided our efficiency offering into three specific thematic areas: energy efficiency, water efficiency and resource efficiency," he explains.

Carbon Border Adjustment Mechanisms (CBAM)

"CBAM is a policy tool, currently in place in the European Union (EU), that puts a carbon price on imported goods from countries with lower carbon pricing policies. It is designed to prevent 'carbon leakage', which occurs when companies move production out of their home country to avoid paying carbon emissions-related costs. CBAM ensures that imported carbon-intensive products have similar carbon costs to domestically produced ones," Raphulu explains.

"This policy is influencing industry to adopt and use production methods and mechanisms that foster urgency in mitigating carbon emissions and the adoption of climate adaptation technologies," he explains. "It also supports localisation, research and development, innovation, skills development and capacity building in our country," he adds.

In addition to this EU mechanism, the UK will introduce a CBAM from January 2027, and other importing countries are likely to follow suit. "Following COP 30, I believe several more countries will be committing to a CBAM policy," he predicts.

Identifying and reporting on carbon emissions to comply with schemes such as CBAM can highlight the most effective ways to systematically reduce emissions associated with specific production paths, thereby leading to cleaner production, improved energy and resource efficiency, and increased productivity.

South Africa's decarbonisation mandate

"South Africa has committed and is facilitating industry to comply with global decarbonisation goals in several ways, including the funding and support of NCPC-SA projects to help industry with resource efficiency and the use of clean production methodologies and tools. We have the Carbon Tax, the Climate Change Act, and



Left: The NCPC-SA recently hosted a two-day hybrid event to advance the drive for sustainability and competitiveness in industrial spaces. **Right:** NCPC-SA Sustainable Industrial Spaces delegates highlighted the success of two flagship initiatives: the Sustainable Energy Systems for Urban-Industrial Development (SESID), to accelerate the uptake of renewable energy; and the Global Eco Industrial Parks Programme (GEIPP), which fosters efficient resource use, industrial symbiosis and cleaner production.

the Air Quality Act, which all incentivise industry while encouraging industrial compliance and investment in technologies that lower carbon emissions,” Ndivhuho Raphulu points out.

“There is notable progress with regards to national awareness, capacity, skills and investment in climate resilience projects by industry, including independent power producer (IPP) industry development. We have developed basic and strategic regulations, and we are now well placed to accelerate our path to decarbonisation through facilities that encourage industry to invest in green and climate-resilient technology and business development,” he notes.

He adds that while some saw these regulations as making South African industry less competitive, many now see the long-term advantages. “If a company in the UK, a company in Kenya, and a company in South Africa are all making a similar product, the competitive nature of that product would traditionally be related only to the direct cost of production and the selling price. Today, quality and the impact of that product on people’s health and the environment are additional factors to consider. The traceability of the additional quality, health and environmental factors is now a key aspect to competitiveness, particularly in international markets,” he argues.

Achieving decarbonisation

Any production facility or industry that consumes energy, uses water and material resources, and produces waste can benefit from decarbonisation and a focus on how a plant performs against specific measures to determine and report the sources and levels of emissions. “A decarbonisation path requires a strategic and focused national capacity, skills development and investment initiatives, which all contribute to strong and sustainable economic growth.

“Improving access and reducing the costs of greener technologies is a long-term process, though. The hydrogen economy is set to play a positive role in our future decarbonisation strategy, supporting renewable energy and sustainability. Now, the costs

of green hydrogen and the technology and infrastructure required to support projects are limiting factors for project implementation and viability.

“Still, our government’s approach is to attract private investment, leverage international partnerships, and identify strategic applications for green hydrogen as a catalyst for re-industrialisation and economic transformation. This is not just a response to the climate crisis,” he notes, adding that tax deductions on investments in electric and hydrogen-powered vehicle production are likely sometime after 2026.

Hard-to-abate sectors, such as steel, fertiliser, cement and heavy-duty mobility, can all benefit from adopting green hydrogen. “Our national target is to produce one million tonnes of green hydrogen annually by 2030, and seven million tonnes by 2050, which would boost the economy significantly and create jobs,” he says.

The NCPC-SA’s extended offering

The NCPC-SA support is one way the government provides tangible assistance to industry in navigating the challenges of decarbonisation. The NCPC-SA makes use of its funding from the Department of Trade, Industry and Competition (DTIC) to assign specialists to collaborate with a production facility’s technical and maintenance teams, identifying opportunities to reduce emissions through energy management and waste reduction.

“In addition, when we have identified an opportunity that requires investment, we can help develop bankable proposals on how to implement some of the recommendations and how to manage the transition to cleaner production. This approach helps to remove uncertainty and ensures that the interventions deliver all the compliance and productivity results identified,” assures Raphulu.

The Sustainable Industrial Spaces Conference 2025

Industrial spaces, such as industrial development zones (IDZs), special economic zones (SEZs) and industrial parks, offer strategic opportunities for decarbonisation and energy

security due to their integrated infrastructure and key locations. The NCPC-SA is currently implementing four multi-year projects with the United Nations Industrial Development Organization (UNIDO) to drive sustainability, particularly in the area of sustainable energy.

The Sustainable Energy Systems for Industrial Development (SESID) project is accelerating the uptake of renewable energy in industrial spaces through integrated planning and pilot projects. At the same time, the Low Carbon and Positive Energy Project promotes the optimisation of energy consumption and the generation of distributed renewable energy in industrial spaces. The Global Eco-Industrial Parks Programme (GEIPP), which has been operational for five years, promotes efficient resource utilisation, industrial symbiosis, and cleaner production. Additionally, the Global Clean Hydrogen Programme is set to launch in South Africa in early 2026.

Industrial spaces have significant potential to produce energy for their own consumption and to serve nearby communities, as well as to provide greener infrastructure for industrial companies of all sizes. Together with the DTIC and international project funders, these initiatives are collaborating with selected industrial sectors, all of which are at varying levels of readiness and adoption of sustainable industrial development models.

The NCPC-SA recently hosted a two-day hybrid event to advance this drive for sustainability and competitiveness in industrial spaces, bringing together key stakeholders at the CSIR ICC in Pretoria and online.

“We make these opportunities and the tools we produce freely available to industry to support their journey, and we have been encouraged to see how many of South Africa’s large emitters are taking up the challenge and partnering with us and others towards a low-carbon and resource-efficient future,” concludes Raphulu.

The NCPC-SA conference content, including presentations of green hydrogen and future energy models, can be viewed on the NCPC conference website, along with content from their 2024 and 2022 events.

www.industrialefficiency.co.za

The Fuels Industry Association, CF2 and Imbizo 2026



Avhaphani Tshifularo, Chief Executive of the Fuels Industry Association of South Africa.

“**T**he rebrand from the South African Petroleum Industry Association (SAPIA) to the Fuels Industry Association of South Africa (the Association) signals an intentional, long-term shift from ‘oil’ to an inclusive fuels ecosystem that includes liquid, gaseous and synthetic fuels, as well as the future infrastructure needed to power mobility,” begins the Association’s Chief Executive, Avhaphani Tshifularo.

The change, unveiled during our 30th anniversary conference in 2024, aligns with South Africa’s net-zero pathway and the need to improve air quality in our cities.

“We convene technical, regulatory and market working groups that interface with standards bodies, such as SABS/SANS, and government to keep specifications current and enforceable. In terms of quality, our members adhere to SANS fuel standards. They are preparing for the introduction of the Clean Fuels II (CF2) by 2027, which is equivalent to the Euro 5 vehicle emissions standard. We also engage the Department of Minerals and Petroleum Resources’ (DMPR) pricing process to ensure fair, transparent and predictable pricing under the Basic Fuels Price (BFP) system.

On fraud, he says, the Association works

Chief Executive Avhaphani Tshifularo discusses the new direction and key priorities of the Fuels Industry Association of South Africa, the 2027 implementation of the Clean Fuels II (CF2) regulation, and what we can expect from the 2026 Fuels Industry Imbizo.

closely with stakeholders, including the South African Revenue Service (SARS) and law enforcement, to combat illicit trade. This includes our advocacy efforts to eliminate fuel adulteration practices that undermine safety, emissions, and environmental goals. Industry supports stronger market surveillance, tighter licensing and a robust national fuel-marking programme to curb the sale of illicit products.

Priority areas for the year 2025

The Association, together with its members, has identified six key priorities: security of supply, customs and excise regime reform, refinery support, petroleum product pricing reform, liquefied petroleum gas regulatory and safety improvements, and diesel adulteration prevention.

“These are not merely operational concerns but rather systemic challenges that require urgent policy responses, cross-sectoral collaboration and decisive leadership,” says Tshifularo.

Security of supply: The Fuels Industry Association of South Africa has consistently highlighted the critical importance of securing long-term tenure leases for the liquid fuels infrastructure at South Africa’s ports. Without firm, reliable access to port infrastructure, our industry cannot guarantee a consistent supply of fuels to inland and industrial markets. Nor can the Association’s members justify the significant investment required to maintain and expand the country’s energy infrastructure.

Historically, access to coastal oil im-

port infrastructure has been governed by lease and concession agreements with the Transnet National Ports Authority (TNPA). The Minister of Transport has recently issued a Directive under Section 79 of the National Ports Act, which represents progress in addressing the long-standing uncertainty. Still, the Association maintains that some concerns may arise, and that further engagement is urgently required to ensure that the framework provides meaningful security of tenure.

Reforming the Customs and Excise Regime: The Customs and Excise Act of 1964 remains deeply outdated. Initially developed in an era of domestic refining dominance, the Act fails to accommodate today’s reality of an import-driven, multi-product pipeline system supporting a globally integrated fuels market. Its limitations result in delays, inefficiencies and compliance confusion, particularly for importers of aviation kerosene, petrol, diesel and illuminating paraffin.

We therefore welcome the announcement by the Minister of Finance in the 2025 Budget Review on Revenue Trends and Tax Proposals that, in the light of the fuel industry in South Africa shifting from local manufacturing dominance to importing refined petroleum products, “SARS proposes to review the legislation on the fuel industry to align it with changes in this industry and to facilitate the movement and storage of fuel products.”

“This review is not just welcome; it is essential. Modernisation of the Act must reflect current trade practices, reduce administrative burden, make compliance seamless, and remove bottlenecks in the movement and storage of fuel products,” Tshifularo notes.

Refinery support: In the last 5 years, South Africa has lost three refineries. This contraction of local refining capacity is more than a commercial concern; it is a strategic risk. In an increasingly volatile geopolitical landscape, a balanced approach to imports and local refining is necessary to mitigate the country’s exposure to shipping delays and global supply chain disruptions.

For nearly two decades, the Fuels Industry Association has advocated for government-backed financial support for the domestic refineries. “We believe the remaining refineries should be supported to secure South Africa’s



The Astron Refinery in Cape Town is one of South Africa’s last remaining major oil refineries.

long-term refining capabilities, in a similar way to how countries such as Australia have introduced a Fuel Security Services Payment (FSSP) under its Fuel Security Act in 2021.

In this model, refiners are paid a production payment during loss-making periods based on the number of litres of FSSP fuels they produce. FSSP fuels include petrol, diesel and jet fuel. To receive the FSSP, domestic refiners must commit to keep operating until at least 30 June 2027, with the option to extend this to 30 June 2030.

A similar model can secure South Africa's refining capacity, protect local jobs and ensure fuel security during times of global disruption.

Petroleum Product Pricing: In July 2024, President Cyril Ramaphosa announced a review of the petroleum product pricing system. The DMPR engages with industry stakeholders to obtain input on the RAS Terms of Reference. This was followed by their internal procurement process, culminating in the publication of both the final Terms of Reference and the tender advertisement. The advertisement was published on 25 September 2025, with a closing date of 21 October 2025.

The current system, while well-intentioned, is in dire need of structural reform: The Magisterial District Zones (MDZ) are based on outdated transport logic, and there are over- and under-recoveries in the system that need to be balanced to ensure a fair pricing system for wholesalers and consumers. In addition, Coastwise shipping costs are not recovered in the current pricing mechanism.

Furthermore, LPG pricing mechanisms have remained essentially unchanged since 2010, except for the Maximum Refinery Gate Price (MRGP). The Maximum Retail Price has not been reviewed in over a decade, limiting LPG's uptake as a cleaner, accessible energy option across the country.

The Association calls on the DMPR to regularly review all pricing elements for all petroleum products to ensure fairness, competitiveness and alignment with national developments.

LPG Regulatory and Safety Issues: In December 2019, the Minister of Mineral Resources and Energy announced an ambitious initiative to double LPG use within five years, as part of the interventions aimed at securing the country's electricity supply. After the announcement, the Minister later organised a meeting with key LPG stakeholders, including LPGSA, the Fuels Industry Association, and LPG Wholesalers, calling on the LPG Industry to assist the DMPR in alleviating pressure on Eskom's power supply.

The LPG sector has made significant progress in strengthening import and storage infrastructure, advancing household adoption of LPG, and promoting greater diversity and inclusivity within the industry.

There are numerous issues facing the LPG Industry that require specific attention, in particular: the unauthorised use of branded cylinders by others, which infringes intellectual property rights; the unauthorised and unsafe filling of cylinders; and the under- or improper-filling of LPG cylinders, which results in customers being short-changed.

In November 2024, the Competition Commission, under the Energy Suppliers' Block Exemption, approved a transparent, structured mechanism that allows LPG wholesalers to adjust the cylinder deposit to reflect the landed cost of cylinders more accurately. This enhances wholesalers' capacity to supply LPG to South African consumers, encourages investment in cylinder infrastructure, reduces barriers to entry for new participants in the LPG market, and strengthens competition, ultimately benefiting consumer welfare and contributing to supporting overall supply diversification of the national energy mix.

Diesel adulteration prevention: Diesel adulteration refers to the practice of mixing illuminating paraffin or similar solvents with diesel and selling the mixture illegally as compliant fuel for use in engines. Not only does this practice present serious concerns for oil companies, but it also directly harms consumers' equipment and results in an estimated annual loss of R4.2-billion to the fiscus.

Duties are payable on fuel used in engines, whereas marked paraffin is duty-free because it is used for household cooking and heating. Mixing paraffin and other substances with diesel fuel avoids duties, either partially or fully.

To clamp down on the practice, SARS made it mandatory in 1999 to add the chemical marker Mortece MP to paraffin and similar solvents to identify their presence if mixed into engine fuels. It is also mandatory for customs officers to take fuel samples from vehicles and other sources for on-the-spot analysis. While this resulted in steady paraffin sales volumes of around 0.6 million m³ per year until 2019, they had more than doubled by 2024, indicating a significant rise in the number of unscrupulous operators selling adulterated diesel.

To address this decisively, the Fuels Industry Association is calling for a straightforward policy shift: Tax marked paraffin at the same rate as diesel. This would remove the profit motive that perpetuates adulteration, and level the playing field for law-abiding fuel producers, importers and distributors. This single policy change would strike at the heart of the adulteration economy, while supporting and strengthening SARS enforcement efforts and protecting consumers from vehicle damage and fuel fraud.

Climate change

For the fuels industry, two dynamics define

the next decade: faster decarbonisation expectations from climate law and markets, and cleaner local air quality requirements. South Africa's Climate Change Act (2024) introduces carbon budget obligations, while the Carbon Tax Act's rates and design are being tightened from 2030 to 2035.

For fuels, CF2 (2027) will reduce sulphur and aromatics, thereby improving urban air quality and enabling the adoption of newer-technology vehicles. On the transformation side, companies are investing in CF2 upgrades, cleaner logistics, biofuels and hydrogen pilots, while e-fuel collaborations are beginning to surface in the value chain.

"Though we understand that liquid fuels will continue to play a significant role for the next few decades, the outlook is certainly inclusive of New Energy Vehicle (NEVs), with the Electric Vehicle White Paper of Dec 2023 laying out incentives and manufacturing policies to pivot the automotive sector towards charging infrastructure and grid integration as enabling levers. But for the fuels market, we anticipate a gradual rebalancing rather than a cliff," notes Tshifularo.

The Fuels Industry Imbizo 2026

Because the decisions we make between now and 2027, when CF2 goes live, will lock in quality, cost and carbon outcomes for the next generation. The Fuels Industry Imbizo is a vital forum that will convene policy-makers, refiners, importers, logistics operators, automotive stakeholders, aviation/marine stakeholders, financiers and technology providers, with the aims of stress-testing security-of-supply plans; comparing CF2 investment readiness and compliance paths; aligning climate, carbon-tax and product-specification timetables; and forming public-private coalitions to fight illicit fuels and raise standards.

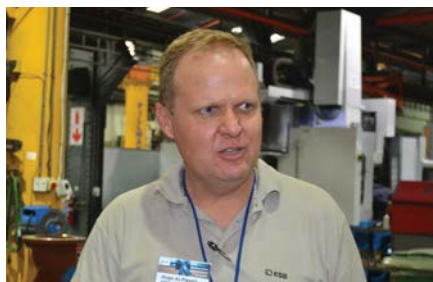
"We are offering tiered sponsorships and solution showcases that include demonstration bays for testing/inspection technology, fuel-quality analytics, logistics safety and digital compliance. Regulator and panel discussion sponsorships are available, and a variety of other sponsorship opportunities will amplify visibility. We also intend to co-create content with *MechChem Africa* and provide post-event access to session recordings and quotes," says Tshifularo.

"There are a lot of important issues for us to talk about, including CF2, supply security, illicit markets, carbon and climate compliance, new energy vehicles, aviation and marine decarbonisation, and, from a skills perspective, building the pipeline for the new specifications, new molecules and new monitoring technologies.

"Please join us," he concludes.

<https://fuelsindustry.org.za>

KSB launches revolutionary Imvubu wastewater pump



KSB Pumps and Valves product manager for wastewater, Hugo du Plessis.

KSB has officially launched the KSB ELN-150 Imvubu, a rugged new self-priming wastewater pump developed and built in South Africa specifically for African operating conditions.

Named after the Imvubu, which is the Zulu

KSB's ELN-150 Imvubu is a new wastewater pump with a 'mouth' large enough to pass 77.3 mm solids, achieving a hydraulic efficiency of 65%. Designed, developed and manufactured by KSB Pumps and Valves in South Africa, this new pump uses the best available global technology and optimises it for the harsh conditions of Africa.

word for hippopotamus, the name carries a double meaning, referring to its distinctive top-mounted lifting 'ears' that mimic its profile in water. At the same time, its massive free-pass mouth and formidable strength mirror the exceptional solids handling ability that swallows up oversized waste, attesting to the toughness and power of its design.

KSB Pumps and Valves product manager for wastewater, Hugo du Plessis, says the KSB Imvubu is the result of years of development, which measured the strengths and limitations

of earlier self-priming pumps used in municipal wastewater networks across Southern Africa. During this time, KSB Pumps and Valves' engineering team worked closely with municipalities and industry operators to understand the realities they face daily, including clogging, solids carry-over, complex maintenance, pump failures in remote areas and the need for equipment that is easy to service in places where skills are often scarce and uptime is critical to prevent spills.

"We live in South Africa and can see the challenges of dealing with sewerage and wastewater. We also listened to the market, where customers told us exactly where the problems lie in terms of pump clogging, difficult seal replacement, thin casings that wear quickly and designs that do not stand up to raw, unscreened sewage. This culminated in the development of the KSB Imvubu pump, which addresses the market's needs. It is proudly designed and manufactured in South Africa and takes the best global technology and optimises it for African conditions," says du Plessis.

He explains that the KSB Imvubu pump was developed using advanced CFD (Computational Fluid Dynamics) modelling and efficiency redesigns of the impeller, volute and hydraulic passageways. The result is significantly improved pumping performance, now reaching more than 65% hydraulic efficiency, which places it well ahead of competitor self-priming pumps currently in service. Critically, the pump achieves a 77.3 mm free-pass solids handling capability exceeding the global raw sewage benchmark of 76 mm. In real-world operation, that 1.3 mm can be the difference between uninterrupted pumping and a costly blockage.

"The free pass is what sets us apart. It is market-leading, which means that if a pump can pass a larger solid, it will clog less. It is that simple, and less clogging means less callouts, less downtime and less cost."

In addition, the KSB Imvubu features bearings-for-life with no oil lubrication required. Unlike competing pumps that require oil chambers, top-up checks, and a risk of contamination, the KSB Imvubu pump utilises grease-for-life bearings and KSB's own mechanical seal, which is lubricated by the pumped medium itself. This makes the pump environmentally cleaner, safer to maintain and significantly simpler to service. The pump body is also cast with thick, heavy-duty volute walls to resist erosion and extend operating life. Its smart design includes



The market-leading impeller design enables the Imvubu pump to pass a larger solid (77.3 mm) than any of its competitors in the wastewater sector.



The new South African-designed and manufactured KSB ELN-150 Imvubu pump is a breakthrough in wastewater handling in South Africa.



The KSB Imvubu pump was developed using advanced CFD (Computational Fluid Dynamics) to redesign the impeller, volute and hydraulic passageways for maximum efficiency and clog-free performance.

an inspection hatch that allows staff to clear blockages without removing the suction cover, a significant advantage for treatment plant technicians and municipal maintenance teams.

"We know that South Africa's wastewater infrastructure is under immense strain with limited resources and ever-rising sewage volumes, which means equipment must be robust and easy to service to ensure its longevity. These

are exactly the issues we have considered and served as guiding principles for our Imvubu pump. Our design directly addresses the problems encountered in the field. We designed this pump specifically for Africa, which is why it is designed to be easily maintained using basic tools and can be speed-adjusted through simple pulley changes. It can also perform the job of two pumps by easily transitioning from low to high heads and low to high flows, eliminating the need for a second pump. It can even be mounted on diesel skids for remote pumping or emergency use during floods. It is versatile, strong and practical," says Hugo.

Applications extend beyond municipal wastewater to mining sumps, industrial effluent, pulp and paper, agricultural waste dams, river abstraction and portable dewatering units. The pump has already proven itself during extended testing at the Drakenstein Wastewater Treatment Works in the Western Cape, where it has operated continuously with excellent results.

Because the KSB Imvubu pump is 100% locally manufactured, it aligns strongly with the Department of Trade and Industry's localisation incentives, which support South African industry and local employment. It also positions KSB Pumps and Valves as a major contributor in the export of high-value engineered products into Sub-Saharan Africa and other regions

where similarly robust and versatile pumps are required.

"This is a pump we are proud to build in South Africa, as it keeps our people employed and shows that we can compete and lead internationally. We like to think that we do not follow; we leapfrog. Our Imvubu pump is a direct answer for many of the failures making national headlines, and the timing in this period of regeneration could not be more significant. Municipalities and utilities urgently need equipment that can keep working away with minimum attention and maintenance to clear the backlog – and we are proud to say the answer is the KSB Imvubu," Hugo concludes.

www.ksb.com

Pump performance specifications

Max Flow:	429.4 m ³ /h
Max Head:	47.6 m
Suction Size:	150 NB (6")
Discharge Size:	150 NB (6")
Solids Handling:	77.3 mm
BEP Flow:	305 m ³ /h
BEP Head:	33 m
BEP efficiency, η:	65%
Operating temp:	up to 80°C

Helping to solve wastewater challenges

KSB Pumps and Valves is doubling its efforts to help the Government and municipalities find practical and technical solutions to the growing wastewater challenges gripping large parts of the country.

As part of a vast global company, the local operation is leveraging its extensive skills base to collaborate with local wastewater service providers in developing innovative solutions for projects of all sizes, ranging from national to municipal and even smaller, case-by-case mini-projects.

"We understand the challenges our municipalities face and as a result we are bringing all our expertise locally as well as internationally to the table to allow us to assist wherever there are wastewater projects no matter the size or complexity – from small schools to large industrial areas and entire cities," says KSB Pumps and Valves Market Area Manager for Water, Wastewater and Irrigation, Hugo du Plessis.

"As a result of challenges at the grassroots level, we have even identified a strong need for an upgrade in our wastewater portfolio and have now introduced this new locally developed and game-changing wastewater pump.

"These types of innovations, combined

with advanced technical services and a wide array of products, are part of our renewed drive to help address wastewater issues in conjunction with municipalities in the country. We also remain mindful of budgetary constraints and have worked within these limits to provide products and services that are cost-effective, versatile and reliable.

"At the same time, we have sourced other suitable solutions from across the globe that have been added to our local arsenal. Now, our next step is to work with consulting engineers and end users from various regions from the inception of their projects to ensure pump stations and treatment plants are designed to work effectively for at least the next 20 to 30 years," says Du Plessis.

KSB Pumps and Valves is well-positioned to provide expertise for all aspects of wastewater handling, from physical requirements to suction conditions in pump stations and specialised equipment in treatment plants, to submersible pumps, mixers and flow enhancers. The company offers uniquely tailored solutions across every stage of the wastewater process, with an extensive range of products that adhere to strict global standards for quality, efficiency, and longevity.

"Our commitment extends beyond merely



KSB collaborates with government agencies, municipalities and engineers to ensure projects succeed.

selling products. We work with government agencies, municipalities, and engineers to provide trusted technical consultation, training and collaboration, ensuring projects succeed. We have also recently launched a series of new products, designed and manufactured locally to meet local conditions, as well as offering products from our KSB global operations that are tailored to local conditions.

We can bring fast solutions to the country's wastewater needs that are locally developed and ideally suited to our local needs," concludes Hugo du Plessis.

www.ksb.com

Grindex submersibles proved in Copperbelt

Grindex submersible dewatering pumps are increasingly favoured by mining operations in Zambia and the DRC for their durability and efficiency in tackling underground water ingress. Jordan Marsh, Managing Director of Integrated Pump Technology, explains.

Grindex submersible dewatering pumps are gaining significant traction among mining operations in Zambia and the Democratic Republic of the Congo (DRC), where demand for reliable and efficient dewatering solutions is increasing. These pumps, renowned for their durability and high performance, have become a preferred choice for mines facing challenging underground water ingress conditions.

Jordan Marsh, Managing Director of Integrated Pump Technology, the official distributor of Grindex pumps in Southern Africa, confirms that the brand has built a solid reputation over the past decade in the most demanding dewatering applications. He anticipates a continued surge in demand as underground mining operations extend deeper, requiring even more robust pumping solutions.

“Dewatering in deep underground mines demands pumps that can handle high flow rates and high heads, while maintaining absolute reliability in extreme conditions,” says Marsh. “Grindex pumps have proven their ability to perform consistently in these environments, making them a trusted choice for copper mines in the region.”

Recent orders received through Integrated Pump Technology’s distributor partner in the

DRC were from a major copper mine and included a range of Grindex submersible pumps, spanning from 5.5 kW to 90 kW. Among these are the Grindex N series, capable of handling high flow rates from 20 up to 100 l/s and the Grindex H series, which can pump to impressive heads of up to 180 m.

This particular mining operation has relied on Grindex submersible pumps for its dewatering needs since 2022, with consistently outstanding performance. Marsh attributes the ongoing preference for Grindex to the pumps’ rugged construction and high efficiency, both of which are critical factors in maintaining optimum production levels and ensuring the safety of underground personnel in waterlogged areas.

To further support its growing base of Grindex users in the region, Integrated Pump Technology deploys teams to regularly assess dewatering applications and ensure that the correct pump solutions are in place. Additionally, through its local distributors, the company provides technical support and ensures spare parts availability, minimising downtime and maintaining uninterrupted operations.

“As mines go deeper, dewatering becomes an increasingly complex challenge. With Grindex submersible pumps, our customers have a reliable and cost-effective solution that is built to withstand the harshest mining conditions,” Marsh concludes.

www.pump-technology.com



The Grindex H series is capable of pumping water to impressive heights of up to 180 m from deep-level mines.



Grindex pumps are renowned for their robust construction and efficiency, enabling mining customers to maintain production and safety even in challenging, waterlogged underground conditions.



Built to handle abrasive and waterlogged environments, Grindex submersible pumps offer dependable dewatering solutions for both surface and underground mines.

Atlas Copco's super high head game-changer range

Atlas Copco has unveiled its new robust lineup of PAS-PAC H/SH super-high-head portable pumps, designed to overcome Africa's harshest environments and sustainably elevate operations to new heights of efficiency.

With an industry-leading 235 m maximum head and exceptional flow rates up to 1 980 m³/h, Atlas Copco's super-high-head pumps are engineered for maximum performance and efficiency. Purpose-built to withstand the harsh realities of Africa's open-pit and underground mining environments, the rugged PAS-PAC H/SH high-pressure pumps are engineered for exceptional reliability and durability, excelling in the management of a wide range of demanding dewatering and liquid handling applications across diverse sectors.

Atlas Copco understands not only pumps, pump technologies and their wide-ranging applications but also the end-users who rely on these products. "As a recognised and trusted authority in portable pumping solutions, Atlas Copco offers a comprehensive portfolio of diesel- and electric-driven pumps engineered for exceptional durability and long service life," states Theuns Viljoen, Business Development Manager at Atlas Copco Power Technique.

Equipped with cutting-edge features and engineered to maintain peak performance and high flow volumes under extreme pressures across various industries, the PAS-PAC H/SH high-pressure pumps excel in the most challenging conditions, ensuring productivity while significantly reducing operational costs.

Viljoen emphasises that, thanks to their versatile design, a single pump can efficiently handle multiple high-pressure tasks ranging from groundwater control and flood management to site dewatering and tank filling. "Built to handle abrasive materials, these robust high heads can handle liquids and media for varying specific gravity, acidity and composition specific to mines."

Viljoen also highlights the new PAC H centrifugal surface pump's capability to handle liquids containing solids of up to 89 mm. "This makes the unit particularly well suited to industrial applications such as water transfer in the oil & gas, quarrying, construction and municipal sectors."

The heavy-duty construction of these super-high-head pumps comprises a wear-, corrosion-, and impact-resistant galvanised skid and engine cover, providing robust protection and supporting an extended lifespan,

low maintenance, and ultimately, a lower total cost of ownership.

All engine service points, including critical wear components, are easily accessible on the super-high-head pumps, streamlining maintenance. This effortless upkeep supports continuous operation and ultimately boosts productivity. The heavy-duty diaphragm vacuum pump, with an optional compressor for priming, delivers long-lasting performance. The integrated mechanical seal oil bath extends dry running capability, further enhancing operational reliability.

When only peak performance and absolute reliability are required and downtime

isn't an option, Atlas Copco's PAS-PAC H/SH super high head portable pumps stand head and shoulders above the rest, tackling challenges that others can't. The ability of these workhorses to deliver high levels of reliability, efficiency and cost-effectiveness drives maximum and measurable return on investment.

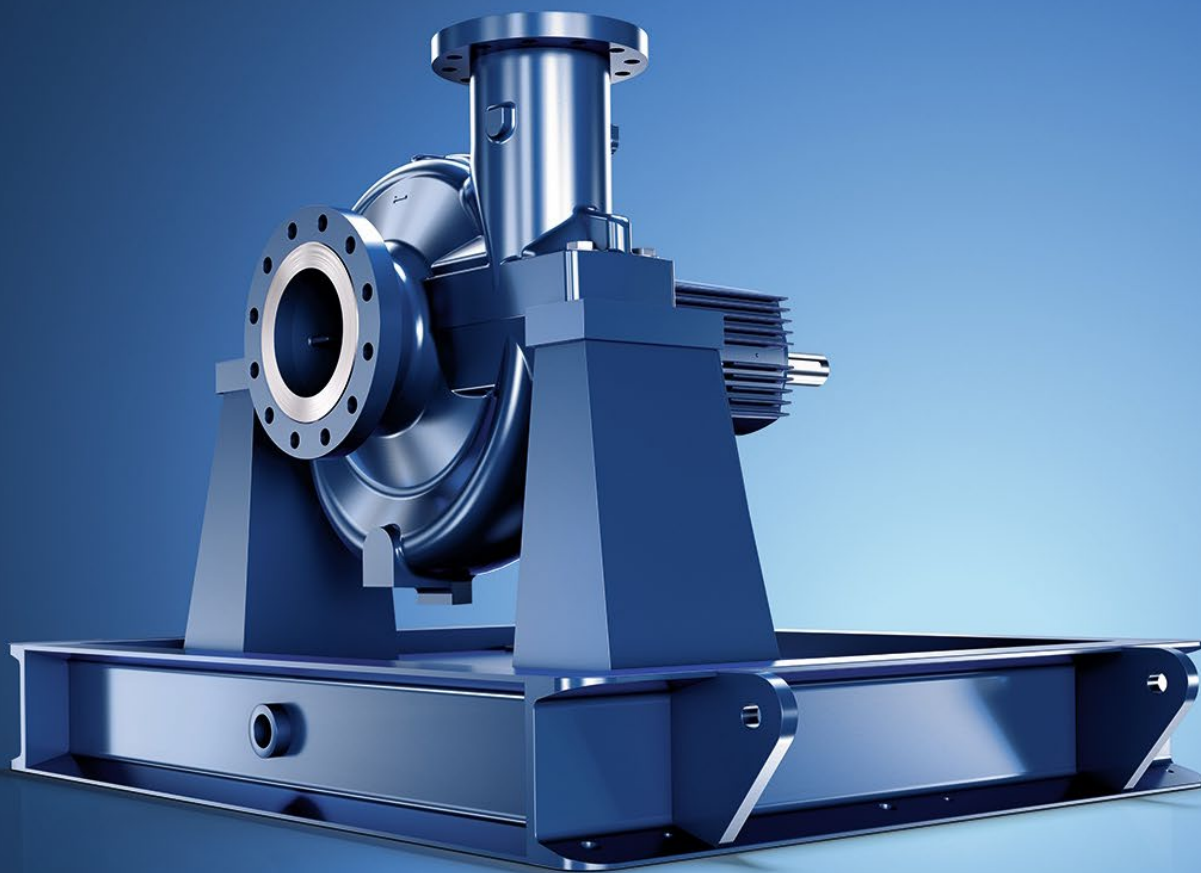
Boasting class-leading super high heads and maximum flows, these robust, premium-quality pumps are the backbone of operations where high performance and unwavering reliability aren't just priorities: they're everything.

www.atlascopcogroup.com



Atlas Copco high-head portable pumps feature an industry-leading maximum pressure head of 235 m and exceptional flow rates.

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Demand for submersible dewatering drives IPR growth

IPR (Integrated Pump Rental) is experiencing strong demand for its submersible dewatering pumps, driven by growing needs in mining, construction and water management applications. Offering Atlas Copco pump ranges, IPR provides flexible rental and purchase options supported by expert technical assessment and service.

IPR, a leading specialist in dewatering and dredging solutions, has reported seeing strong demand growth for its range of submersible pumps across Southern Africa. The continued expansion of mining activities, infrastructure upgrades and the need for reliable water management solutions in both surface and underground operations is driving this trend.

The company, as part of Atlas Copco's Speciality Rental Division, supplies a comprehensive range of electric submersible pumps, including the robust Atlas Copco WEDA dewatering, sludge and heavy-duty slurry pump ranges. These units are engineered to handle the demanding conditions found in applications such as sump dewatering, open-pit dewatering, slurry movement and general water transfer duties. IPR's technical teams work closely with customers to match the right pump to each application – whether it involves clean or dirty water, high solids content or abrasive slurry.

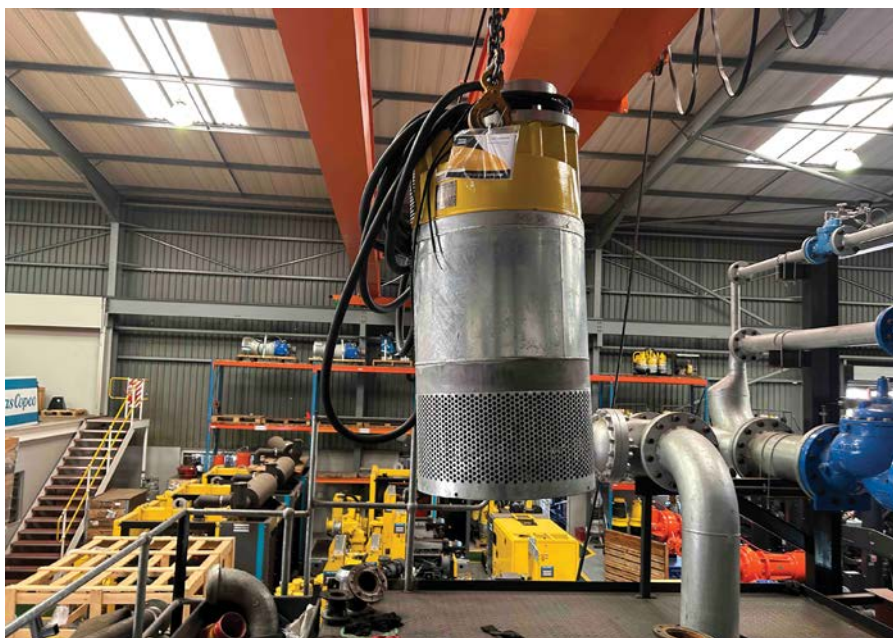
The Atlas Copco WEDA submersible pumps are widely recognised for their portability, efficient performance and durability in harsh conditions. These pumps are ideal for drainage and sludge pumping tasks in both mining and construction environments. The range includes options for light to heavy sludge and slurry, with various motor and impeller configurations available to meet site-specific needs.

Furthermore, the WEDA L range of heavy-duty slurry pumps stands out for their ability to pump highly abrasive slurries with high solids concentrations. Fitted with agitators and specially designed impellers, these pumps are built to perform in environments where conventional pumps would fail, such as in settling ponds, slurry dams and dredging operations.

IPR offers both rental and outright purchase options across its submersible pump fleet, providing customers with flexibility tailored to their project timelines and budgets. This model has proved especially attractive for operations looking to reduce capital expenditure while maintaining access to high-quality equipment and responsive technical support. Rental contracts can be structured to suit short, medium or long-term needs and are supported by IPR's maintenance and service teams to ensure ongoing



Atlas Copco WEDA submersible pumps deliver reliable performance in mining and dewatering projects across Southern Africa.



Atlas Copco submersible dewatering pumps available through IPR deliver dependable water management for a range of operational requirements.

ing performance.

The company's ability to assess application requirements, specify the right equipment and deliver rapid support has made it a trusted partner to the mining, construction and industrial sectors. With demand for submersible

dewatering and slurry pumps showing no sign of slowing, IPR's investment in high-performance equipment, backed by global OEM partnerships, continues to position it as a market leader in tailored dewatering solutions.

www.pumprental.co.za

Bi enters SA's pump market with SAER brand



Bi Product Application Engineer, Glen Espag.

“As a leading supplier and distributor of premium mechanical industrial consumables to key industries across Southern Africa for six decades, our decision to enter the local pump market stems from a natural progression to also offer our customers access to fluid handling products,” says Bi Product Application Engineer, Glen Espag. “By adding pumps to our product portfolio alongside drive systems, torque transfer, bearings and seals, and field services, we’re now positioned to offer a comprehensive suite of products to keep our customers in motion. The partnership will add further value for customers through reduced lead times and enhanced technical support by leveraging local expertise,” he says.

Bi’s collaboration with SAER aligns with its legacy of partnering with top-tier global manufacturers to deliver high-quality products tailored to African conditions. As the sole local distributor, Bi will offer SAER’s range of surface pumps for clear water applications, complemented by a selection of submersible solutions.

According to Espag, the South African pump market generated approximately R10 747.46 million (USD 615.9 million) in 2023 and is projected to reach R13 912.88 million (USD 797.3 million) by 2030, reflecting a compound annual growth rate (CAGR) of 3.8%. “Historically, the market has seen steady growth, and we’re currently witnessing renewed momentum driven by infrastructure investment and water security initiatives,” he notes.

“Growth is expected to exceed 4% annually between 2024 and 2029, with key demand drivers including increased industrial water processing and treatment, infrastructure upgrades (sewage, drainage and water reticulation systems), urban expansion, commercial development and heightened demand from the construction, mining, and agricultural (irrigation) sectors. Climate variability, including drought conditions and flood mitigation

Bi is proud to announce its strategic entry into the local pumps market, through an exclusive distribution agreement with leading Italian pump manufacturer, SAER.

efforts, is also stimulating growth.”

Espag explains that Bi first encountered SAER through industry benchmarking and technical evaluations in early 2025. “Their reputation for robust engineering and responsiveness shone through. Following our initial outreach, discussions progressed rapidly, driven by shared synergies and strong mutual alignment on quality, innovation and market strategy.”

Founded in 1951 by Carlo Favella in Guastalla, Reggio Emilia, SAER Elettropompe

SpA leads the industry in the design, production and supply of high-quality submersible and surface pumps and motors. SAER products represent the excellence of ‘Made in Italy’ in the global pump sector, offering customers and partners exceptional flexibility and innovation, underpinned by an advanced in-house design department and a strong focus on continuous research and development. Engineered for quality, efficiency and long-term reliability, SAER pumps are constructed from high-grade stainless steel, cast iron and



A SAER NCBK 800-670 pump purpose-designed to deliver 10 000 m³/h of water in an irrigation application for a rice paddy.



SAER NCBK volutes being machined.

bronze components, all manufactured in Italy and fully compliant with ISO, CE and, where applicable, local SABS standards.

With a proven track record in global installations, these robust SAER pumps are well-suited to Africa's demanding operating conditions. High hydraulic performance combined with low energy consumption ensures excellent efficiency, while the availability of plug-and-play configurations makes them easy to install and operate.

Under the terms of the agreement, Bi will offer SAER surface pump types, including centrifugal, multi-stage, and high-pressure units, complemented by end-suction and close-coupled variants. Espag explains that they based their decision to prioritise the SAER surface pump range on strong demand in municipal, industrial, and agricultural applications in Gauteng, the Western Cape, and KwaZulu-Natal.

Compared to submersibles, surface pumps offer easier installation and serviceability, as well as greater versatility across various sectors, including HVAC, water transfer, and pressure boosting. "Additionally, they provide scalable solutions suitable for both project-based and stock-driven needs," says Espag, noting that while surface pumps will be their primary focus, Bi will also supply submersible wastewater pumps for select municipal and industrial applications.

Future expansion plans include borehole and deep well submersibles, fire-fighting pump sets, and custom-engineered pump skids.

True to Bi's renowned after-sales service, an ample local stock of critical spare parts will be maintained and supported by a strategic branch network with a national footprint. A dedicated SAER-certified technician will conduct in-depth training for Bi staff, covering product specifications, installation protocols, maintenance and troubleshooting, to ensure that the Bi team is fully equipped to support customers from day one. Bi has also onboarded additional technical sales personnel and invested in upskilling existing staff through comprehensive training on the SAER products.

"We are also focused on empowering customers by offering structured training programmes on the SAER pumps, both on-site



SAER NCB super-duplex end-suction pumps installed in a desalination plant.



A 75 kW 6-pole SAER pump in use in the industrial agriculture sector.

and at Bi's facilities. The sessions, which will address pump operation and maintenance, fault diagnosis and lifecycle optimisation, will be tailored to customer needs and sector-specific requirements," he adds.

"Through our strategic entry into the local pump market together with SAER, we are not only pumping up our existing offering but also reinforcing our role as a trusted, collaborative partner delivering tailored products and solutions to the mining, construction, sugar, agriculture and FMCG sectors. This SAER partnership underscores our unwavering

commitment to helping customers future-proof their business sustainability by anticipating and meeting their evolving needs," says Espag. "We look forward to a long-lasting and mutually beneficial partnership with SAER, one that will create lasting value for both our companies and for our customers."

Bi formalised its sole distributorship agreement with SAER on 15 July 2025, with the first shipment of pump sets arriving in South Africa in early October. SAER pumps are now available.

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Integrated drive solutions for intralogistics applications

This article highlights some of the integrated Industry 4.0 solutions Bonfiglioli can offer to meet the intralogistics needs of Industry 4.0 manufacturing and assembly plants.

Intralogistics systems play a crucial role in ensuring that materials, components, and finished products flow smoothly and efficiently, supporting just-in-time assembly, packaging, palletising, automated storage, warehousing, and much more. For these applications, Bonfiglioli has developed a wide range of integrated drive solutions, as well as modular machine design and software options to help manufacturers improve efficiency, reduce errors and enhance control over their internal operations.

Bonfiglioli drive solutions are at the heart of modern electric forklifts and reach trucks, as well as assembly-line roller and belt conveyors. They are used in automated guided vehicles (AGVs) and automated moving robots (AMRs) in automotive and Industry 4.0 assembly and manufacturing facilities, as well as in automated warehouses used to store materials and components.

Typical Bonfiglioli solutions comprise a geared motor combined with an inverter for efficient motion control, and application-specific software that enables the entire system to perform detailed handling tasks accurately.

Automatic baggage and parcel handling

For roller conveyor drives, Bonfiglioli's typical solution range uses its EVOX CP Series co-axial or orthogonal helical bevel gearboxes, its compact EVOX IE3 electric motors, and a decentralised IP65 DGM-MPM inverter, all bundled into a single module.

The gearbox's compact design offers high torque density and low warehousing costs, thanks to its universal mounting system.

The modular motor delivers uncompromising efficiency, while Bonfiglioli DGM-MPM Inverters, available in power ranges from 0.55 to 30 kW, are simple to install. They include features such as an inventory manager, advanced, sensorless control at low speeds, controlled DC braking and support for field-bus communication.

The combined modular package is designed for easy washdowns and reduced electrical wiring, and it includes a host of other application-specific options.

A similar solution is available for belt conveyors, which typically utilise an A-series helical bevel gearbox to minimise installation space and provide high stiffness for dynamic applications. The BSR Series synchronous IE4 electric motor is preferred for its efficiency, positioning and dynamic performance. A decentralised DGM-MPM Series Inverter can be attached to drive and control the belt.

AMR, AGVs and Material Handling Vehicles

For forklift trucks, the heart of the traction system is a Bonfiglioli high-efficiency, low-noise planetary axle and drive, which includes integrated high-performance electric motors and a low-maintenance braking system. These are typically used for 3- and 4-wheel counterbalance lift trucks and ground support equipment.

These electric powertrains are thoroughly tested in the factory, guaranteeing low energy consumption. This, in turn, means longer battery operating times, extended servicing intervals and lower costs of ownership.

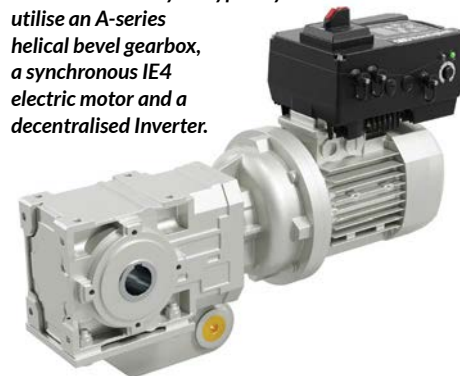
Electric or hydraulic steering units, cus-



Above: A Bonfiglioli solution for roller conveyors using a EVOX CP Series gearbox, a compact IE3 electric motor, and a decentralised DGM-MPM inverter.

Below: Belt conveyors typically

utilise an A-series helical bevel gearbox, a synchronous IE4 electric motor and a decentralised Inverter.

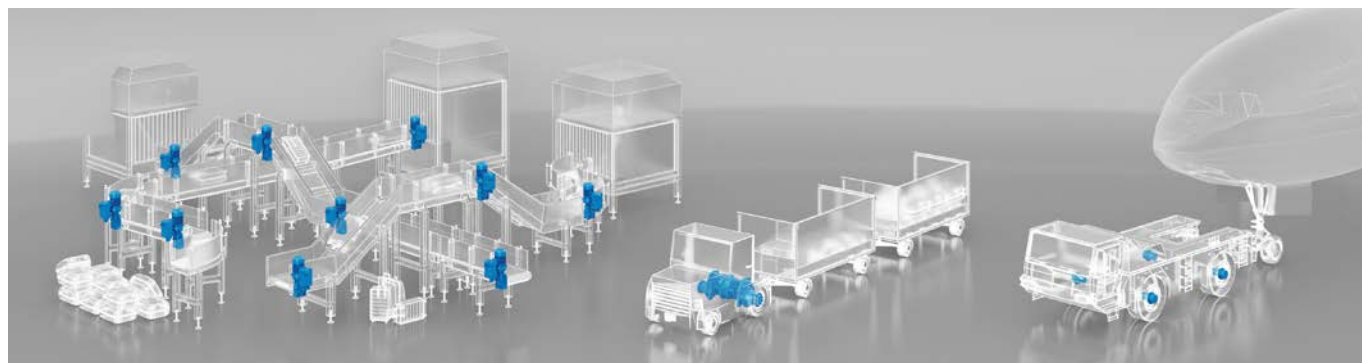


tomised vehicle displays, and DC-to-DC converter options complete the package for these vehicles.

With the AGV (automated guided vehicle) sector constantly expanding, Bonfiglioli's modular design solutions are increasingly being deployed in facilities such as vehicle assembly plants, where the necessary components need to be delivered to a specific point on an assembly line at precisely the right time.

These computer-controlled component-handling vehicles are programmed to safely transport manufacturing materials and components between designated pickup and delivery points within a busy working facility, enhancing workplace safety by eliminating accidents caused by human error.

Bonfiglioli conceives, designs and produces custom solutions for AGVs, leveraging extensive expertise and experience in the intralogistics industry. These solutions are



Bonfiglioli solutions for airports include tow tractors, baggage-handling systems and baggage-claim conveyors.

developed from the ground up, based on in-depth interaction between the customer and the Bonfiglioli team, to ensure that all required specifications and usage variations can be accommodated.

Bonfiglioli's BlueRoll AGV System's Platform enables AGV solutions to be:

- Co-engineered to satisfy a wide range of different requirements, duty cycles and differing application constraints.
- The freely configurable modular approach reduces complexity and makes various drive combinations and sizes available to match the performance requirements.
- The platform can accommodate specific industry requirements, such as special operating temperature, surface IP protection, compliance with particular regulations, safety functionality, critical borderline application conditions and more.

The system offers three variants – BlueRoll Basic, BlueRoll Advanced, and BlueRoll Compact – with three gearmotor sizes, accommodating loads of 360 kg, 720 kg, or 1,020 kg at operating speeds of up to 2.0 m/s.

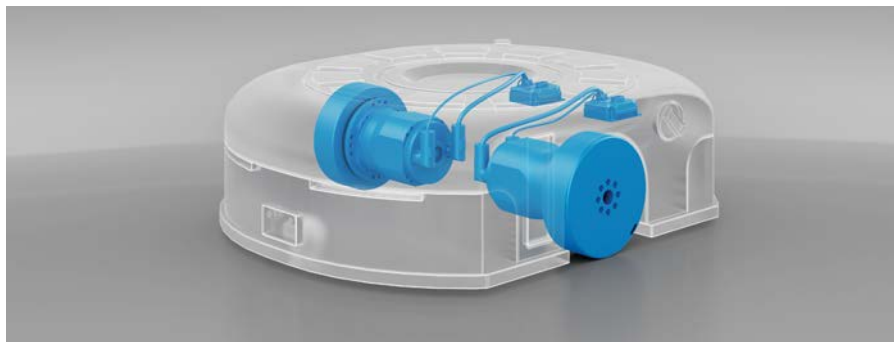
The roller drive comprises two rollers, each powered by a Bonfiglioli TQW wheel-mounted precision planetary gearbox and a premium-efficiency permanent magnet synchronous motor. This combination delivers high torque density, high overload capacity, exceptional precision and low vibration.

A wide range of feedback systems, including safety encoders, enables the motors to be accurately controlled, allowing these driverless vehicles to navigate autonomously between pickup and delivery points. AVG designs can be compact and are extensively cus-

tomisable to suit application requirements.

With over 20 years of experience in creating tailored and forward-thinking motion control systems, Bonfiglioli has proven to be a reliable partner for entire motion drive trains in Industry 4.0 applications. Bonfiglioli centres of excellence continuously develop breakthrough mechatronic innovations, including low-backlash planetary gearboxes, servomotors, open- and closed-loop inverters, servo drives and regenerative energy units.

www.bonfiglioli.com/south_africa/en



Bonfiglioli's modular AGV design solutions are increasingly being deployed in facilities such as vehicle assembly plants.

SKF and Sieb & Meyer partnership for magnetic bearings

SKF has announced a strategic partnership with Sieb & Meyer, a renowned expert in variable frequency drives (VFDs) and control electronics. The collaboration marks a significant milestone in delivering integrated, high-efficiency inverter solutions tailored for demanding applications such as air compressors, turbo blowers and HVAC systems.

Under the partnership, SKF will manufacture variable frequency drives at its facilities, leveraging Sieb & Meyer's advanced design expertise and decades of experience in high-speed drive technology. Customers will benefit from a seamless, plug-and-play solution that simplifies integration, reduces engineering time, increases confidence in system performance, and enables long-term scalability into new applications.

The collaboration will enhance SKF's offering by delivering an optimised package that combines SKF's high-speed electric motors on magnetic bearings with VFDs precisely tuned for performance, reliability and energy efficiency.

"By combining our magnetic mechatronics capabilities with Sieb & Meyer's VFD technology, we're creating a new standard for high-speed motor systems. This partnership allows us to offer a more complete and efficient solution to our customers," says Frederic Ponson, Director of SKF Magnetic Mechatronics.

"This partnership represents a powerful

alignment of expertise. By integrating Sieb & Meyer's advanced inverter technology into SKF's high-speed motor systems, we deliver a smarter, more efficient solution that meets the evolving demands of HVAC, air compressor, and blower applications. Together, we're setting a new benchmark for performance and reliability," says Markus Meyer, CEO at Sieb & Meyer.

Moving forward, the partnership will expand its scope to include boil-off gas compressors and spindle drive systems, further broadening the range of industries that can benefit from this integrated approach.

In general, the sustainability benefits of SKF's magnetic bearing systems include a reduction in energy use and the elimination of oil-related pollution in comparison with conventional solutions using rolling bearings. In energy-intensive applications such as wastewater treatment, compressed air, or HVAC, high-speed electrical motors levitated on magnetic bearings machines can reduce energy consumption by up to 30%, resulting in 10 to 15% savings for entire facilities and lowering greenhouse gas emissions from electricity generation.

www.skf.com



SKF magnetic bearing systems reduce energy use and eliminate oil-related pollution.



www.bonfiglioli.com

Tel: 011 6082030

MEPS rules create opportunity, says SEW-EURODRIVE

With South Africa's Minimum Energy Performance Standards (MEPS) for premium-efficiency IE3 motors now mandatory, SEW-EURODRIVE sees a valuable opportunity for geared-motor users to boost efficiency.

South African regulations on premium-efficiency IE3 motors open the door to opportunities for geared motor users, says SEW-EURODRIVE, but planning and the considered advice of established and trusted experts are vital.

With the Minimum Energy Performance Standards (MEPS) now mandatory, many users of electric motors might be confused about their next step. Worse still, they may be vulnerable to poor decision-making due to uncertainty and opportunistic buying, according to Willem Strydom, SEW-EURODRIVE's Manager for Business Development Electronics.

"Having supplied IE3 motors as standard in our relevant geared units for some years already, and at no added cost, there is nothing in

the regulations surprising to us or our customer base," explains Strydom. "However, there are still many players in the market who might not be up to date with the regulatory developments – and we are well placed to be of service."

He notes that some companies may feel pressured by fear-mongering market messages to replace less efficient motors unnecessarily. On the other hand, the looming moratorium on the sale of IE1 and IE2 motors may lead to these units being 'dumped' on the market at cut-rate prices. This may tempt companies to purchase outdated technology, which will ultimately prove costly in terms of energy consumption.

"The regulations remind the market of the financial and sustainability value of using more efficient motors, but the real benefit lies in system efficiencies," says Strydom. "This is where companies can benefit the most when planning their shift to IE3 motors."

Natasha Meintjies, Business Development Electronics Proposal Engineer at SEW-EURODRIVE, explains that the customer journey often begins with an energy-efficiency test, which SEW-EURODRIVE conducts at no cost on the customer's site.

"By measuring the energy consumption on the customer's existing motors and comparing this to our IE3 motors, we can provide them with an energy cost saving analysis," says Meintjies. "There is typically an immediate cost saving of 4 to 8% of the motor's power consumption, but more significant benefits can be achieved when moving to the system level."

This includes SEW-EURODRIVE's more



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



Natasha Meintjies, Business Development Electronics Proposal Engineer at SEW-EURODRIVE.

energy-efficient drives, which can take energy savings to another level—up to 20-30%, she says. These results are achieved by integrating the latest monitoring and optimisation technologies into the system.

"This also gives the customer more overall process stability and reduced maintenance costs," she says. "Our modular designs ensure that all the components work together seamlessly for the best efficiencies and performance, making the whole system more reliable."

Strydom highlights that SEW-EURODRIVE's global research and development has ensured that the company already has super-premium efficiency IE4 and ultra-premium efficiency IE5 motors in its market offerings.

"Our in-house laboratory in Germany is also third-party approved to test our motors for energy efficiency, as the IE3 benchmark has been mandatory for some years in Europe," he says. "The test certificates that we issue are therefore accepted by South Africa's national regulator, since we have been working on this well in advance to be ready for these regulations."

He points out that MEPS will be a valuable enabler for companies to mitigate the effect of rising power costs, especially if they reassess their drive systems with an integrated approach in mind and with experts like SEW-EURODRIVE to advise.

The MEPS specification applies to a broad range of three-phase, low-voltage electric motors with rated power output between 0.75 and 375 kW, including motors with non-standard mechanical dimensions and geared motors. Motor users are permitted to run their existing IE1 and IE2 motors until they fail and need to be replaced. From a retailer's point of view, these IE1 and IE2 motors may be sold until May 2026.

www.sew-eurodrive.co.za



Designed for hygiene and efficiency, SEW-EURODRIVE IE3 motors are ideally suited to the rigorous demands of food and beverage production facilities.



In logistics and warehousing, SEW-EURODRIVE IE3 motors provide dependable energy-saving drive solutions that keep operations efficient and downtime to a minimum.

Integrated solutions across comminution flowsheet

Constantly expanding and upgrading its range of crushing and screening solutions, Weir now offers mines an integrated selection of premium-quality high-pressure grinding rolls (HPGRs), crushers, screens, and screening media. JD Singleton explains why this has created an unmatched opportunity for customers to achieve improved uptime while reducing their cost per tonne.



JD Singleton, Weir's Comminution Director for Europe, Middle East and Africa (EMEA).

To complement its market-leading ENDURON® range of high-pressure grinding rolls (HPGRs), Weir has developed a robust range of crushers and screens under the same premium brand – now further strengthened by its in-house screening media.

“Combined with our renowned service culture and extensive global footprint, this creates a truly unmatched offering,” says JD Singleton, Weir’s Comminution Director for Europe, Middle East and Africa (EMEA). “In just 15 years, we have evolved from being primarily recognised for our high-quality pump solutions to becoming a global leader in the comminution space.”

He notes that Weir’s large ENDURON® Elite double-deck banana screens have been in high demand and will soon be produced at the company’s Alrode facility south of Johannesburg, where expansions are underway to create a dedicated production bay for this purpose.

“Large vibrating screens are vital to complement large capacity crushing plants and HPGR circuits, and our ENDURON Elite range is playing an important role in hard rock mining developments throughout Africa,” he says. The latest orders include a contract with a leading brownfields mining project in Zambia. The first

units from Weir’s Alrode plant expansion are expected to start rolling out later this year.

Weir’s research, development and innovation behind the ENDURON® Elite range of screens include creating the largest exciters available on the market. Having developed the LTX exciter to generate the +1 mega newton force to vibrate these screens, Weir went on to develop its second-generation exciter – the ETX, with 1.28 mega newton force, which has

been nominated for technology awards, says Singleton.

Weir’s ENDURON® Elite ETX Exciter is a groundbreaking advancement in vibratory screening technology, delivering the world’s only mega-newton linear-motion exciter, capable of generating forces equivalent to a fully laden A380 passenger jet on take-off – 12 to 16 times per second. This patented innovation redefines a 50-year-old mechanism, setting a



Weir's large ENDURON® Elite double-deck banana screens are being produced at the Alrode manufacturing facility in South Africa.



Weir now offers EDURON® screen media panels to complement the ENDURON® range of vibrating screens.

new global benchmark in performance, reliability and efficiency.

The ENDURON® range of jaw and cone crushers, equipped with improved control and lubrication systems, comes standard with premier ESCO® crusher liners for longer life and less downtime. The latest generation of Weir's ENDURON® cone crushers and jaw crushers has also just been introduced.

"A key factor behind the success of ENDURON HPGRs and our complementary crushers and screens in the mill circuit has been the rising cost of electricity, affecting not only South Africa but many other countries in Africa," he says. "Mines are adopting HPGR circuits as an energy-efficient alternative to the traditional semi-autogenous grinding (SAG) mill circuits."

Among the studies in which Weir assists customers is a comparison of a circuit using a primary crusher, SAG mill and ball mill with a circuit comprising a primary crusher, a secondary cone crusher, HPGR, a screen and a ball mill.

"We work with customers at early planning stages to find ways of reducing energy consumption with technology like HPGRs," he says. Weir supports these solutions through its service culture across a wide footprint, giving the company a presence within 200 km of any large mine, anywhere in the world," Singleton concludes.

www.global.weir



Mines are adopting HPGR circuits as an energy-efficient alternative to the traditional semi-autogenous grinding (SAG) mill circuits.

Weir screens set the pace for expanding African mines



Corné Kleyn, Global Product Manager for Vibrating Screens at Weir.

With brownfield expansions becoming increasingly common due to their lower risk and cost compared to new greenfield projects, Weir has seen rising demand for high-capacity vibrating screens to enable high-throughput operations, as well as machines with a wider operating window to address changing feed conditions. These market trends were crucial in choosing the most important design elements of the new ENDURON® Elite vibrating screens from Weir.

Several key trends are currently shaping the vibrating screen market in Africa. According to Corné Kleyn, Global Product

Manager: Vibrating Screens at Weir. These include the need for high-capacity machines for brownfield expansions, demand for screens with a wide operating window to meet changing feed conditions, and the growing focus on screen designs that minimise energy consumption and reduce wear and tear to ensure sustainable operations.

These trends, says Kleyn, were central to Weir's design approach for its new ENDURON Orbital and ENDURON Elite vibrating screen ranges, with customer feedback playing a crucial role in informing some of the most essential design elements of these innovative machines.

A case in point is the high-capacity nature of the ENDURON® Elite range, which successfully addresses the growing need for high-capacity vibrating screens for brownfield expansions, especially as opencast mines seek to ramp up production.

"With the launch of the ENDURON® Elite vibrating screen range, Weir now offers some of the largest double-deck banana screens in the world, weighing up to 50 tonnes. Some of the first units operating in an iron ore application in West Africa measure 4.3 x 9.7 m, which highlights the large nature of these screens to meet high throughput needs," says Kleyn.

One significant design feature of these screens is the use of ETX exciters. Capable of driving a vibrating screen with a deck that spans 4.27 m, these exciters have the largest capacity of any exciter currently available on the market. Their large size allows the large Elite vibratory screens to be driven with two exciters, reducing exciter drive complexity and maintenance costs. This provides high performance and long service life. In addition, fewer exciters to maintain on-site translates into reduced downtime, fewer routine inspections and less inventory management.

As mines expand and get deeper, changing feed conditions – such as variations in ore grade, particle size, and mineral composition – are becoming the norm. This, says Kleyn, can significantly impact the efficiency and cost-effectiveness of mineral processing operations.

When feed conditions change, he adds, screens are subject to harmonic resonance, which can lead to structural failure. To mitigate this, Weir has designed both its ENDURON Elite vibrating screen ranges with a wider operating window, giving operators greater flexibility to adapt operating parameters to changing conditions.

www.global.weir



Pieter Uys, Business Development Manager, Multotec.

One challenge faced by rock and mineral mining operations is that the extraction and processing of these materials often place rigorous demands on equipment, particularly during the screening stage. Mines typically rely on various types of screening media to efficiently separate and classify materials. However, the harsh conditions inherent in mining operations – such as heavy impacts from large rocks and abrasive materials – can lead to rapid wear and tear on traditional screening media, such as woven wire mesh.

This results in frequent maintenance interruptions, increased operational costs, and potential safety hazards for workers. As a consequence, many mines experience significant downtime and inefficiencies, highlighting the need for more durable and effective screening solutions that can withstand the rigours of mineral processing while minimising operational disruptions.

Strategic screening upgrade

A case study illustrates how a rock and mineral mine in South Africa turned to Multotec to address challenges with its woven wire mesh screening media. The company opted for a strategic solution by transitioning to Multotec's side-tension polyurethane (PU) mats, which effectively resolved the operational issues that the mine was experiencing.

The mine operates as an open-pit facility, specialising in the production of various rock and mineral products, including metallurgical materials, commercial aggregates and lime products. These materials are essential for numerous industries, supplying metallurgical products to steel producers and aggregates to the construction sector.

Issues encountered with woven wire mesh

In line with common practices in the quarry industry, the mine utilised woven-wire mesh screening media in its secondary sizing plant. Although this type of screening media is generally affordable and readily available, it presents several disadvantages.

Multotec's side-tension PU mats

Pieter Uys, Business Development Manager at Multotec, describes a case study highlighting the advantages of switching from woven wire mesh screening media to Multotec's side-tension polyurethane (PU) mats.

"In this case, the woven wire mesh struggled to withstand the impact and abrasion from the product stream, necessitating frequent change-outs, sometimes as often as twice a month. This led to high maintenance costs due to frequent purchases of new mesh, production interruptions during change-outs, increased labour hours, and associated health and safety risks. It also led to the need for entire screen decks to be replaced when small sections of the mesh failed," says Pieter Uys, Business Development Manager at Multotec.

Finding a reliable solution

The mine sought assistance from Multotec to find a more effective solution for its screening needs. After evaluation, they decided to transition from woven-wire mesh screen media to side-tension PU mats, which are designed for enhanced durability and can be installed on existing vibrating screens without requiring structural modifications.

Says Uys: "A key aspect of this solution was the custom hand-casting of PU mats to fit the exact dimensions of the vibrating screens, ensuring a precise fit and optimal performance. Additionally, these PU mats offered the advantage of easy installation in place of the traditional woven wire mesh panels, minimising downtime during the upgrade process. Notably, this innovative approach is applicable across various operations within the sand and aggregate industry, making it a versatile and practical choice for improving screening efficiency."

Globally, Multotec's PU mats are also successfully used with other commodities, including Platinum Group Metals (PGMs), limestone, gold and coal.

Measured results and cost efficiencies

Despite the initial capital expenditure required to convert to side-tension PU mats, the mine has experienced significant improvements in the performance of its screening media. Since their installation, the PU mats have not required replacement for over a year. There has been a substantial reduction in maintenance, labour, and material costs, and downtime has decreased significantly, along with fewer health and safety risks associated with frequent changes. Furthermore, noise levels have been significantly reduced, resulting in improved working conditions.

"The cost savings realised by moving from changing out mesh up to twice a month to not changing the PU mats at all in more than a year are favourable. There have been significant improvements in terms of downtime, labour and direct material costs," adds Uys.

As a result, the mine's total cost of ownership for the PU mats has dramatically decreased since their conversion. Additionally, Multotec's commitment to customer service is demonstrated through the assignment of a dedicated sales engineer who understands the plant's processes, manages replacement panel stock levels, and can respond quickly to operational challenges.

www.multotec.com



The conversion from woven wire mesh screening media to Multotec's side-tension polyurethane mats significantly reduced the customer's total cost of ownership.

Charting the future of milling efficiency

With a relentless focus on research and development, Tega Industries has introduced world-beating technologies to the market, positioning the company as a dominant player in the global mill liner and wear solutions market.

Much of Tega Industries' success comes from its close customer engagement and a willingness to challenge conventional thinking in mineral processing. This was evident at its industry conclave, held recently in Pretoria and attracting over 170 attendees from mines across the world, where a number of speakers provided a clear picture of where the industry is heading and how smarter milling can deliver measurable gains.

Tega Industries Africa CEO, Vishal Gautam, opened the event by outlining the financial case for adopting better methods and equipment. He argued that milling operations have long been obsessed with availability and tonnage, but seldom translate those metrics into business value. "We are not here to just supply liners, we are here to help you unlock hidden potential in your plant," he assured attendees.

He made the case for adopting an Overall Equipment Effectiveness (OEE) framework that exposes underutilised assets and inefficiencies, not just at the equipment level but across the value chain. For mines operating on tight margins, small percentage improvements in mill performance translate directly into millions of Rands saved or earned. The call to action was clear that treating mill optimisation as a strategic business lever rather than a maintenance exercise makes more sense.

Continuing on the topic, Professor Aubrey Mainza, Deputy Director of the Centre for Mineral Research, warned that many plant managers continue to operate their mills in the dark. While technologies such as variable-speed drives and modern discharge designs are available, they are often misunderstood or misapplied.

He emphasised that volumetric filling – the correct balance of ore, media and water – dictates performance. Too much or too little filling alters the internal dynamics, changing the number of particles in contact with the grinding media and thereby undermining throughput.

Training in measured adjustments is far more valuable than relying solely on control systems that only protect the mill. Efficiency is not about buying more equipment, but about disciplined control of filling, discharge, speed, and media, coupled with training operators to think in small, precise corrections.

Sumeet Pahi rounded off the session by highlighting how Tega is translating these

insights into product innovation. "Discharge systems are too often neglected despite being central to circuit stability. Poor grate design, blockages or inadequate media can create 'washing machine' effects where slurry circulates without exiting the mill, wasting energy and hammering liners."

As a result, Tega's research and development teams have developed optimised discharge designs and wear monitoring tools that not only extend liner life but also stabilise grind conditions. Sumeet explained that innovation in liner metallurgy, lifter profile and grate configuration must be paired with customer-specific testing to deliver real results. "Every plant is different and every ore body is different. The answer is not a catalogue product but a collaborative design process."

The conclave included talks and case studies from several specialists and mine operators, including Sandile Nkwanyana of Mintek, Flavio Silva de Moura of Lundin Mining Brazil, Jennifer Giron, ex-senior metal-



Aubrey Mainza of the Centre for Mineral Research emphasised the importance of balancing all aspects of the mill.

lurgist at FQML, who is now working at Tega, as well as Process Manager, Mr Steven Zulu, and Vamumusa Manyathi, who is the Business Development Manager of Tega.

The combined expertise painted a clear picture: the era of treating mill liners as consumables is over. Tega's approach of marrying business metrics with technical fundamentals and engineering helps mines unlock hidden efficiencies and improve profitability.

www.tegaindustries.co.za



Tega product manager for milliners, Sumeet Pahl, says the company constantly innovates to find solutions for its customers.



Vishal Gautam, CEO of Tega Industries Africa, opens the conclave discussions.

Smart chute solutions at Gamsberg Mine

Weba Chute Systems has expanded its presence at Vedanta Zinc's Gamsberg mine through a series of custom-engineered chute solutions that address complex material flow challenges and reduce equipment wear.

On the strength of its first transfer chute installation at Vedanta International Zinc's Gamsberg mine in the Northern Cape, Weba Chute Systems has steadily expanded its footprint at this dynamic operation.

According to Arnold Archer, Regional Manager Northern Cape at Weba Chute Systems, the company's involvement began early in the mine's development with a custom-engineered chute to feed the semi-autogenous (SAG) mill.

"Over time, we collaborated closely with the mine to enhance the chute's performance," says Archer. "This included optimising the composition and thickness of the cast liners to extend their wear life."

To simplify and speed up liner replacement during shutdowns, Weba Chute Systems redesigned the spout liner pattern. The company also introduced a standby spout system that could be swapped out via a simple bolt-off, bolt-on procedure, enabling maintenance even outside scheduled shutdowns.

"As we demonstrated our expertise and added value, the mine invited us to assess other transfer points where they were experiencing operational challenges," Archer explains. "These included the jaw crusher feed chute and the apron feeder discharge chute, both of which handle large run-of-mine ore lumps up to 800 to 1 200 mm."

Material arriving at the jaw crusher was also moving at high velocity, leading to excessive wear and damage. After analysing the applica-

tion, Weba Chute Systems proposed a solution.

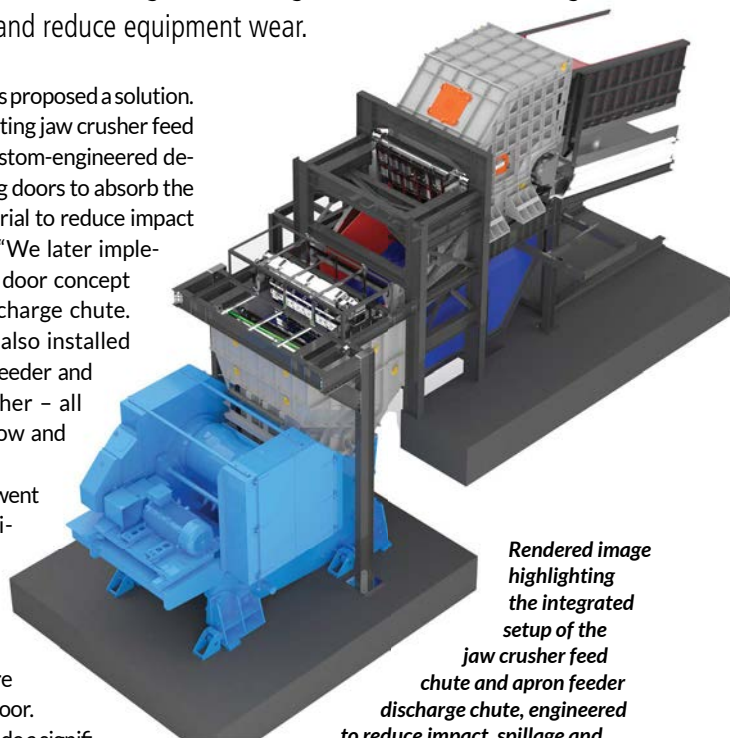
"We replaced the existing jaw crusher feed chute with one of our custom-engineered designs, incorporating swing doors to absorb the energy of incoming material to reduce impact and wear," says Archer. "We later implemented the same swing door concept in the apron feeder discharge chute. Today, swing doors are also installed on the vibrating grizzly feeder and directly above the crusher – all effectively controlling flow and reducing wear."

Weba Chute Systems went a step further by modifying the impact bed on the grizzly feeder. By raising the impact bed, incoming material begins to slow down before reaching the first swing door.

"These innovations made a significant difference, particularly in managing the impact from oversized lumps," he notes. "We also finetuned door weights to optimise material flow, prevent build-up and reduce the risk of blockages."

The mine also commissioned Weba Chute Systems to install a SAG mill discharge chute, which Archer reports has been operating "like clockwork" since commissioning. This chute accommodates a 4.0 m transfer height, tapering from a 2.4 m-wide screen opening to a 600 mm-wide conveyor belt.

"The success of this bespoke unit lies in the



Rendered image highlighting the integrated setup of the jaw crusher feed chute and apron feeder discharge chute, engineered to reduce impact, spillage and blockages.

careful placement of dead boxes within the chute to promote material-on-material flow," he explains. "It was equally important to manage the discharge speed to avoid damaging the conveyor belt."

Archer credits the Gamsberg plant's professional, solution-oriented culture, which emphasises resolving root causes rather than symptoms and working collaboratively with trusted suppliers to overcome technical challenges.

www.webachutes.com



Left: A rendered image of Weba Chute Systems' custom-engineered jaw crusher feed chute, designed with swing doors to absorb impact and control ore flow, reducing wear from oversized run-of-mine material. **Right:** Rendered image of the apron feeder discharge chute, incorporating Weba Chute Systems' swing door design to manage high velocity flow, extend liner life and enhance reliability.

Metso opens Circored pre-reduction DRI pilot plant

Metso has inaugurated its Circored™ pre-reduction pilot plant in Frankfurt, Germany. This investment reflects Metso's commitment to advancing low-carbon technologies and supporting the global transition to fossil-free steelmaking.

The Circored™ pilot plant, which is based on Metso's proprietary technology, enables continuous pre-reduction of iron ore using hydrogen as the sole reducing agent. It integrates pre-heating, reduction, gas cleaning and recirculation systems for hydrogen and dust, and features electric heaters to support near-zero carbon operation.

"This pilot plant is a significant step in demonstrating the readiness of Circored technology," says Parizat Pandey, Director, Direct Reduced Iron (DRI) at Metso. "It allows us to validate process parameters and support our customers in their transition to low-carbon steelmaking".

In the Circored pilot plant, a wide range of iron ore types can be tested, providing process data for engineering future commercial-scale plants. It also helps define the operating window for different

ore qualities.

The Circored direct reduction process can also be integrated with Metso's DRI Smelting Furnace or other smelting technologies. Circored process benefits include:

- No fossil fuels are required for the reduction of iron ore fines.
- Energy and the costly pelletizing step are eliminated.
- The HBI or DRI products can be fed directly into an electric arc furnace, improving energy efficiency.
- Performance has been proven in an industrial-scale demonstration plant using an established fluidised bed process.

Both Circored and DRI Smelting Furnace technologies are part of the Metso Plus offering, which provides sustainable value to customers through technologies that have a significant impact on the



Metso's Circored is the only 100% hydrogen-based process for iron ore reduction that has proven its functionality and performance in an industrial-scale demonstration plant.



The ribbon cutting for Metso's Circored™ Direct Reduced Iron (DRI) pre-reduction pilot plant in Frankfurt, Germany.

environment and people. "By sharing knowledge and combining forces with customers, partners and communities, we can accelerate sustainable development in our industries," concludes Pandey.

www.metso.com

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Measuring what matters in oilfields

This case study from the Indian oil and gas industry highlights the use of VEGA's MINITRAC 31 radiation-based sensor for non-contact density measurement of liquids and bulk solids, and the VEGA radiometric multipoint density array (MDA) profiling system for characterising the oil extracted from the Mangala field in the Rajasthan desert.

India's population is nearing 1.4 billion, and as a developing country, its energy needs are increasing. According to UN forecasts based on current economic growth of 5 to 7%, consumption will double from 2020 levels by 2035 to 2040. This has already led to increased domestic production and the expansion of domestic oil refineries. Oil companies face challenges in meeting demand, however, as they extract and refine oil in remote regions under difficult climatic conditions, where resources take many years, even decades, to access.

Enhanced oil recovery

The oil extraction process often yields a mixture of difficult-to-characterise products due to varying densities and viscosities across different drilling sites. Conditions at the wellhead, such as pressures, gas content, temperature and contamination, are rarely consistent. This variability affects extraction and processing costs, presenting a significant challenge in improving yields while pursuing discoveries.

Enhanced oil recovery (EOR), also known as tertiary recovery, addresses key industry challenges. EOR employs methods such as chemical injection, ultrasound or steam to boost crude oil recovery by up to 20%.

Once EOR is implemented, downstream treatment processes can improve. Crude oil first passes through a slug catcher, which separates liquid slugs. At this stage, oil, water and sand are sorted for further processing, using measurement technology to optimise efficiency and ensure safety.

Cairn Oil & Gas, a subsidiary of Vedanta

Ltd, utilises multi-density arrays (MDAs) made up of vertically arranged radiometric density sensors in its slug catcher to enhance separation efficiency. Here, VEGA's MINITRAC 31 non-contact sensors monitor density over a vertical range of 0 to 5 000 mm using advanced scintillating-crystal technology to avoid contact with the process medium. This setup enables real-time data transmission to the control centre, ensuring smooth operations at the Rajasthan Field.

The Mangala field

Large oil reserves are becoming increasingly rare, and the costs of developing and producing them continue to rise. As a result, there is a growing interest in enhancing yield. To this end, Cairn Oil & Gas and Vedanta Ltd. secured a significant area in the Rajasthan desert back in 2002. This remote location lacks water access and transport links, but prior seismic surveys provided encouraging sonic data suggesting the presence of extensive oil deposits beneath the surface.

It took another two years and the drilling of 15 expensive exploratory wells before success finally came in January 2004, when Cairn tapped into the new 'Mangala' oil field in the vast North Indian desert. Globally, this discovery turned out to be the most significant oil find of the year, and India's biggest onshore discovery in 25 years.

It wasn't until five years later, in 2009, that oil extraction finally began. According to India's Economic Times, the Mangala field has since produced 473 million barrels of crude oil. To put that into perspective, if this oil were transported



VEGA's radiometric system precisely monitors separation layers in the slug catcher, protecting equipment and maintaining crude quality under extreme conditions.

in standard-sized freight train cars, the train would wrap around the globe nearly 40 times. Notably, Cairn produces almost 25% of India's annual crude oil output from this single field.

VEGA MDA profiling

The oil from this site is unique due to its waxy characteristics, which cause rapid solidification upon surfacing. The pipeline, therefore, which extends about 700 km, is the world's longest heated crude oil pipeline. Before reaching refineries, the oil is cleaned at the extraction site to remove water, sand and impurities.

Thorough simulations were essential for pipeline construction and designing the slug catcher. Slug catchers manage slug flow, temporarily storing liquids between the pipeline outlet and processing facilities to protect downstream equipment. These slug catchers rely on droplet separators, which can reach capacity quickly if overloaded. To prevent solid contaminants from accumulating, the VEGA MDA density profiling system monitors density data at various heights within the slug catcher. This ensures efficient separation by accurately tracking the movement of the separation and emulsion layers.

Reduced maintenance

The density-measuring system selected by



Left: To prevent solid contaminants from accumulating, the VEGA MDA density profiling system continuously monitors density at multiple heights. **Right:** Oil yield depends on more than extraction, optimising raw materials before refining boosts efficiency and output.

Cairn is designed for minimal maintenance, as all detectors are mounted externally on the vessel, avoiding direct contact with the process. A flexible mounting system allows for a straightforward yet robust installation, and the detectors remain easily accessible for any necessary maintenance. With multiple measuring points operating independently, issues with a single detector won't disrupt the entire system's performance.

Ease of use for the VEGA MDA system begins even earlier in the process; rapid commissioning and calibration of the measuring system significantly reduce start-up times and costs. Additionally, extensive diagnostics via the PACTware® configuration software, along with its device type manager (DTM) and electronic device description (EDD) technologies, connect the field devices and controllers to provide a clear, straightforward overview of the system's health.

Sensor intelligence

In the oil production industry, yield is influenced by more than just the volume of material that reaches the surface. There is a growing emphasis on optimising raw materials before they head to the refining stage. This is why Cairn has taken a close look at every step of the crude oil processing journey.



With oil reserves dwindling and costs rising, Cairn Oil & Gas and Vedanta Ltd are driving yield gains in the Rajasthan desert.

One of the common issues that has received particular attention is slugging, the formation of plugs that hinder flow. The precise monitoring of separation layers in the slug catcher, facilitated by the VEGA radiometric system, enables efficient operation of this critical separation process. This reliable measuring system performs effectively in extreme temperatures, preventing large solid slugs from being carried downstream.

This helps protect downstream processes and components, ensuring the quality of crude

oil is maintained as it moves through pipelines to the sea for loading onto ships for further transport.

VEGA is known for its long history of innovation and is recognised as a global leader in measurement technology. The company is dedicated to precision and reliability, and its customised solutions have positively impacted businesses worldwide, improving processes, efficiency and quality standards.

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Thermal carrier choice and management across multi-use sites



When choosing a thermal carrier for multi-use process optimisation, AES's Commercial Director, Dennis Williams, emphasises the importance of asking questions to help understand the use requirements. He then goes on to highlight the place for steam and its alternatives.

start is by fully understanding the company's primary product, and the potential roles of different thermal carriers in the production process.

Steam and multiple-use challenges

Steam remains the most user-friendly thermal carrier. Inert, non-toxic and safe, it minimises dangers such as product contamination or fire in the event of a leak, which can happen with thermal oil, which is highly flammable and operates at high temperatures. Therefore, from a process safety management perspective, steam is a good choice. Furthermore, steam can be generated across a range of pressures, and heating can be tightly controlled.

In the event of the thermal carrier of choice being steam, and in an ideal world, a single steam user has a consistent load demand and operates continuously. In reality, it is more common to have to manage a dynamic steam plant operation, featuring multiple users, which requires strong technical skills, good communication and close attention to optimise results, emphasises Williams.

Understanding the process comes first

when setting out to achieve efficient, optimal steam generation and thermal energy supply across a multi-use site, he notes: "This is critical to determine the energy flows required in terms of timing, tonnages, pressures, variability profiles and condensate return generated. These factors form an overall operational 'map' of the variation in demand and load on the steam plant."

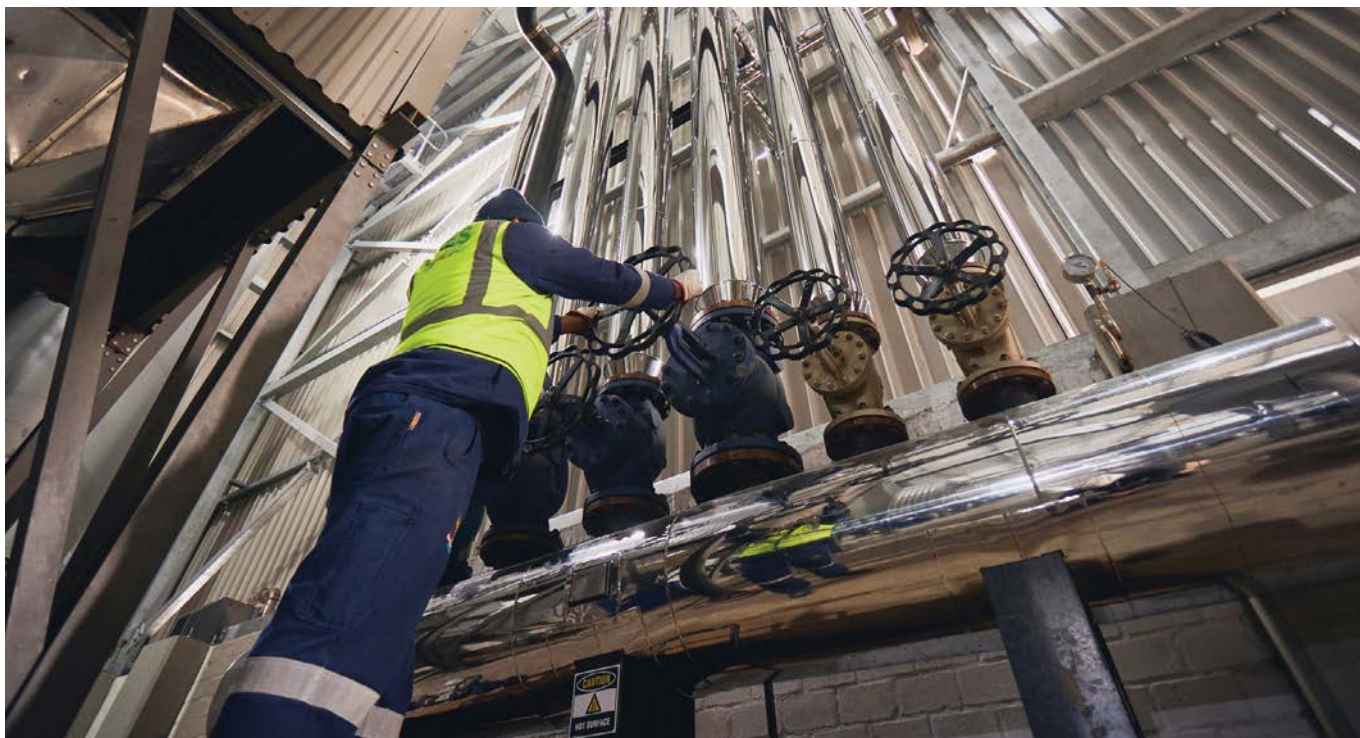
AES then determines the best operational strategy, including when to start which assets, specific boilers' load profiles at particular times, and the management of risk in the event of equipment challenges or breakdowns. Site-specific operating procedures (SSOPs) are optimised based on the plant's configuration and user requirements.

AES's Remote Monitoring System (RMS) gathers steam generation plant data and records critical operational monitoring parameters. This data is essential to monitor boiler efficiency and steam quality," Williams explains.

The focus is not only on minimising steam use to achieve energy requirements, but also

When it comes to making the correct choice of thermal carrier for production optimisation, boiler operations and maintenance service provider AES's Commercial Director Dennis Williams believes many questions must be asked: "These include how the energy is being used, if its supply should be outsourced, and if it is the right fit for every manufacturing process," he says.

"Other pertinent questions would be how much of the facility is aligned with steam and how much with another thermal carrier? What are the implications of switching those? If changes are made, could the cost of production be reduced and quality improved?" he continues, advising that the best place to



A steam header with multiple process steam offtakes

on maximising the percentage and quality of condensate return to save water and recover heat.

Additionally, pivotal Process Safety Management (PSM) within a multi-user environment requires consistent practices across multiple boilers: "We must ensure safe operation for multiple boiler plants, multiple combustion devices, more hot surfaces, more maintenance and variations thereof if using different boiler designs, fuels or combustion systems," Williams points out.

Alternatives to steam

Pressurised hot water: Williams says that lower temperature requirements of 120 to 150°C do not require steam. Instead, by using a pressurised water heater, the water temperature will rise to the desired level without boiling and flashing to steam. This process is widely used in companies such as breweries. Another example is when cleaning a plant or equipment.

Gas and hot air: The textile and paper industries use gas and hot air extensively. "In the paper industry, there is a hood over the main paper cylinder, which is heated using gas. The flame is not fired onto the paper. Instead, it is used to heat the air directly in front of the burner flame. A flue gas-air mixture radiates

onto the paper surface to dry out the last bit of moisture," Williams explains.

Alternatively, manufacturing or processing companies can use a combination of thermal carriers. For example, in the food production sector, an AES client that manufactures coffee and coffee creamer utilises gas and steam-heated air to dry the product.

Thermal oil: Thermal oil is widely used in the textile sector, where it is circulated through stenters and other textile machinery to provide the required temperatures for fabric heat treatments. "Thermal oil, therefore, has specific applications, where higher temperatures can be achieved than when using a typical industrial process steam application," Williams points out.

Making the right choice

"Decision-makers could unlock far more lasting and meaningful savings by carefully analysing key issues such as sustainability and efficiency," he continues, adding that many companies are now integrating different thermal processes, including across multi-use sites, into one fully optimised system.

However, the capital outlay will differ across thermal carriers, with decisions influenced by the selection of the fuel and associated technology.

In summary, when considering thermal carrier changes or upgrades – including across multi-use sites – Williams warns against price-based procurement and recommends a longer-term, value-based approach: "It is about deriving maximum value from the production process and achieving optimal operational performance, margin and end-product," he concludes.

AES is a leading steam and boiler operations and maintenance (O&M) service provider that operates in the power generation, chemical, plastics and rubber, timber, pulp and paper, textiles, food and beverage, and mining sectors of South Africa. The company helps industrial plants optimise their energy production processes and achieve best-practice energy use, including reduced downtime, efficient and cost-effective fuel combustion, extended plant life, energy resource diversification, and a smaller carbon footprint.

www.aes-africa.com



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Energy regulations: easing the path for IPPs

Stefan Bothma, Senior Project Developer at Sustainable Power Solutions (SPS), highlights SPS's role in helping independent power producers (IPPs) in the renewable energy sector navigate the uncertain landscape towards Eskom grid connection approval.



South Africa has abundant solar and wind resources with significant potential for renewable energy development.

Independent Power Producers (IPPs) and developers venturing into South Africa's renewable energy sector face an onerous, challenging regulatory landscape characterised by uncertainty over securing grid connections and substantial development costs.

This is according to Stefan Bothma, Senior Project Developer at Sustainable Power Solutions (SPS), who explains that Eskom's approval processes, coupled with complex environmental and land-use procedures, contribute to the complexities faced by IPPs and supplementary power suppliers. This creates challenges for project developers entering the renewable energy market without the support of development funds and strategic partners who can guide projects to financial closure.

SPS is a renewable energy asset management company actively expanding into the energy trading and wheeling market, enabling businesses to buy and sell energy directly and promoting a more flexible, cost-effective energy market. These SPS projects enable more enterprises to transition to renewable energy.

Grid connection uncertainty

"The regulatory process to obtain grid connection can be quite intricate. While the regulations are clearly defined, the certainty of connection and grid capacity remains variable. Eskom operates within a dynamic market, and although it may indicate capacity availability at the time of application, this status can change by the time the application process is finalised. This variability introduces a level of uncertainty for IPPs navigating this regulatory landscape," explains Bothma.

However, he adds that the uncertainty in the regulatory environment presents an opportunity for a company like SPS, given the significant financial resources, experience and patience required to navigate this challenging landscape.

"While the process can be quite challenging, SPS has the potential to leverage its capabilities to capitalise on opportunities that may be out of reach for smaller players. The regulatory requirements, including the need for substantial financial guarantees, have increased the costs of obtaining application approval. Consequently, not every small developer has the financial resources to see a project through to completion," adds Bothma.

Opportunities for bigger players

"This has created a positive outlook for companies like SPS, as we now see more developers approaching us at an earlier stage, once they have secured the land and some of the necessary permits. Previously, these developers would have been able to take projects all the way to grid connection without needing a partner who can cover the increased costs of the grid application until approval," Bothma notes.

He further adds that now, these developers require the involvement of companies like SPS much earlier in the process. This has led to more opportunities for the company, and a significant part of their work is evaluating which of them they want to pursue.

Francois van Themaat, Managing Director: Large Projects at SPS, says he would ideally like to see greater certainty around grid capacity, which is currently one of the biggest challenges for IPPs. "By the time the applica-

tion process is complete, the applicant may have already spent millions of Rands, yet there is no guarantee that the required grid capacity will still be available. This uncertainty around capacity availability is a major pain point for IPPs traversing the regulatory environment," says van Themaat.

Tariff structures

The ongoing restructuring of Eskom, along with the uncertainty surrounding future tariff changes, also poses significant challenges for IPPs. It is challenging for IPPs to sign long-term agreements with clients, as these effectively lock clients into a specific tariff structure. This creates some uncertainty for IPPs looking to secure long-term offtake agreements, which are crucial to the viability of their projects.

The Growing Potential of South Africa's Renewable Energy Sector

Despite the challenges, van Themaat says the outlook for the renewables sector is promising, as South Africa has abundant solar and wind resources with significant potential for renewable energy development.

"Renewable energy prices are continuing to come down, making it more viable. The growth of electric vehicles and energy-hungry data centres in South Africa creates increasing demand for renewable power," says van Themaat. "At the same time, there is a skilled workforce in South Africa capable of developing renewable energy plants and sufficient funding available through companies like SPS to support renewable energy projects," he concludes.

<https://sps.africa>

Centre of excellence for hydrogen energy launched

Standard Bank, in partnership with the Vaal University of Technology (VUT), have announced the official launch of the Standard Bank Centre of Excellence for Hydrogen Energy. This pioneering initiative marks a significant step towards advancing research, innovation, and sustainable practices in South Africa's hydrogen energy sector.

The recently launched Standard Bank Centre of Excellence for Hydrogen Energy, made possible through Standard Bank's support for Phase 1 of the project, will serve as a catalyst for clean energy solutions, positioning VUT as a global leader in hydrogen energy research. The initiative, which was first soft-launched in March of this year, aligns with Standard Bank's commitment to driving Africa's green transition and contributing to a just energy future.

Simone Cooper, Head of Business and Commercial Banking at Standard Bank South Africa, says: "Hydrogen energy is one of the most exciting frontiers in South Africa's journey to a sustainable future. By investing in this Centre of Excellence, Standard Bank is helping unlock the potential of research, academia and finance working together to solve pressing energy challenges. Our commitment is not only to back innovation but also to ensure that solutions are inclusive, scalable and capable of driving economic growth across the country

and continent."

Professor Khehla Ndlovu, Vice-Chancellor and Principal of the VUT, emphasised the strategic importance of the partnership. "The Centre of Excellence for Hydrogen Energy represents a milestone in VUT's research journey. By combining academic expertise with Standard Bank's leadership in sustainable finance, we are positioning South Africa at the forefront of hydrogen energy innovation. This initiative will not only contribute to global research but also open new pathways for collaboration, investment, and economic development. Importantly, it will inspire our students and community to see themselves as active participants in shaping a sustainable future."

The Centre has already attracted strong international interest, including partners from Europe, Asia and Latin America, highlighting its potential to drive meaningful impact both regionally and globally.

With the support of Standard Bank, VUT is the only African member of a 13-partner



Simone Cooper, Head of Business and Commercial Banking at Standard Bank South Africa.

European consortium exploring hydrogen innovation, thereby placing South Africa firmly on the global map of clean energy research.

<https://vut.ac.za>

Hitachi electrifies Geita Gold Mine

Hitachi Energy has announced the deployment of its power quality solution to securely connect Tanzania's leading gold producer, Geita Gold Mine Limited (GGML), to the national grid, which comprises 45.5% renewable energy sources. The project replaced 80% of the fossil-fuel generators used by GGML for power generation and is expected to reduce the site's carbon emissions by at least 50 000 tons of CO₂ per annum. AngloGold Ashanti plc, the owner of GGML, collaborated with the government of Tanzania, its power utility Tanzania Electric Supply Company (TANESCO), and Hitachi Energy to execute the project.

As part of the project, Hitachi Energy delivered a state-of-the-art power electronic converter that stabilises the mine's connection to the grid, featuring a PCS 6000 STATCOM system. The system's performance is further optimised through MicroSCADA, which provides crucial real-time monitoring and control.

With extensive project execution capabilities, Hitachi Energy engaged with partners in

Tanzania, providing supervision and training to contractors, fostering skills development, and contributing to community upliftment. The company strengthened local capacity through these efforts, ensuring long-term success and sustainability while delivering cutting-edge technology.

"We are proud to support Geita Gold Mine Limited in this landmark achievement. AngloGold Ashanti's unwavering commitment to sustainability and climate resilience across their business, value chain and communities sets a remarkable standard in the industry," said Mohamed Hosseiny, Managing Director at Hitachi Energy in Africa. "It is reassuring that our pioneering technologies and solutions are advancing a sustainable energy future for all."

The project is a testament to Hitachi Energy's expertise in providing solutions, executing projects, and developing pioneering technologies. The PCS 6000 STATCOM system was pre-assembled, tested to the highest standards, and shipped as a containerised



Hitachi Energy has delivered a state-of-the-art power electronic converter that stabilises the mine's connection to the grid.

package for fast installation on-site. Its compact design and adaptability to harsh mining environments make it a compelling solution for industrial and remote grid applications.

Electrification solutions, such as the STATCOM system, are crucial to accelerating the global energy transition. By delivering innovative technology to high-impact markets, Hitachi Energy empowers the world's energy system to be more sustainable, secure, resilient, and affordable.

www.hitachienergy.com/africa/en

SEW-EURODRIVE Service Centre to transform drive repairs



Raymond Obermeyer, MD of SEW-EURODRIVE South Africa.

In a momentous step for the local industrial gearbox and drives market, SEW-EURODRIVE South Africa has formally opened a new service and repair facility alongside its headquarters in Aeroton, Johannesburg.

"For the first time, customers can have all aspects of their industrial gearbox dealt with in one place – and to the highest OEM quality standards," Raymond Obermeyer, Managing Director of SEW-EURODRIVE South Africa, says. "This allows us to offer unprecedented warranties on service work, giving the market peace of mind, quicker turnarounds and enhanced uptime on their repaired and refurbished units."

The company has invested almost R385 million in the new 17 000 m² facility, which began construction a year ago. This followed just years after the company built its R500 million, 26 000 m² head office complex in Aeroton, which it moved into in 2022. These developments form part of SEW-EURODRIVE's proactive investment in added service capabilities worldwide, which amounted to €1 billion in 2024 alone.

Obermeyer explains that, in an unprecedented move, the new service facility marks the end of an era in South Africa, where industrial gearbox users had to in-

volve multiple service providers in a single repair or refurbishment contract.

"The expertise and equipment in this facility allow SEW-EURODRIVE to conduct all aspects of a drivetrain repair – from the gearbox and coupling to the motor, steelwork and electronics," he says. "We now have all this capability at our disposal, which is game-changing in terms of quality, reliability and warranties."

He highlights that the investment in skills and sophisticated hardware now gives the company comprehensive control over the repair process and the results.

"Previously, we were often limited by the fact that other players were involved in the work on many service interventions – and we could not take responsibility for their level of workmanship," he explains. "As a world-class OEM and with our steadfast commitment to quality processes and components, we can now offer warranties of two years on our repairs and refurbishments. This has never been possible before and represents a significant and high-value development for customers all over Africa."

The new service centre will even conduct work on gear units from other manufacturers, he notes, given the depth of the experience and infrastructure at SEW-EURODRIVE's new world-class service and repair facility. Over 65 additional technical staff are being brought on board at the site, including engineering managers, field service engineers, and artisans in various specialised disciplines.

"Our centre is being equipped with some of the most experienced skills in the local market, and our in-house DriveAcademy is busy fine-tuning its expertise in line with our wide range of drive solutions," Obermeyer says.

Fully equipped with the latest technical infrastructure, the new facility will include vibration analysis and diagnostic testing of motors and drives, as well as equipment for 3D scanning and CNC machining. Winding machines will enable motors to be rewound in-house and tested in accordance with SEW-EURODRIVE's global OEM standards.

"The facility will also include a fabrication department, so that we don't have to outsource components such as base plates, flanges, guards and other steelwork," he says. "With the capacity to do our own cutting, bending and welding, this department allows us to conduct all this work in-house – speeding up turnaround times and ensuring constant quality control."

Obermeyer concludes that the breadth of in-house services and engineering equipment at the SEW EURODRIVE service and repair centre represents a significant investment in the re-industrialisation of the local economy, allowing customers to optimise the longevity and performance of their drive systems.

This aligns with the company's commitment to strengthening its position as the leading provider of industrial gearboxes and drives on the African continent.

www.sew-eurodrive.co.za



Left: SEW-EURODRIVE South Africa's R385 million investment in its new 17 000 m² service and repair facility underscores its long-term commitment to local industrial growth and re-industrialisation. **Right:** Mr Jürgen Blickle, global CEO of SEW-EURODRIVE, assisted by the company's South African MD, Raymond Obermeyer, cut the ribbon on the new service and repair facility in Aeroton, Johannesburg.

System sizing critical for boiler water treatment

Cutting corners on water treatment can cost companies far more than they realise – especially when boilers are involved, says Lionel Maasdorp, Managing Director at Allmech, a leading South African manufacturer and supplier of boilers, water treatment equipment and chemicals.

“All too often, clients come to us requesting a specific softener size or quoting a specification from another supplier,” says Allmech MD, Lionel Maasdorp. “They might be offended when we ask for a water analysis to substantiate their request, but the truth is, one size doesn’t fit all when it comes to water treatment. Proper system sizing depends on the unique composition of the incoming water. We often find that small changes in the plant can yield better results for

the client than they initially requested. Sizing the plant based on proper data has better results than just guessing and saves the client from spending money unnecessarily.”

Maasdorp notes that some customers have insisted on purchasing an undersized plant, only to have to upgrade it later, which has proven extremely costly. Ignoring specifications can lead to more significant headaches down the line, resulting in downtime and production challenges.

“We’ve had customers who insisted on using less salt in their softeners or diluting boiler chemicals to cut costs,” he explains. “When their systems are serviced, the results are clearly visible – corrosion, scale and fouling that could have been avoided. In the worst cases, we’ve seen boilers requiring acid washes or even tube replacements, which are extremely expensive and can reduce the lifespan of the equipment.”

Why adhere to specifications?

Customers who follow a water treatment specialist’s recommendation and maintain their systems according to specifications are more likely to enjoy outstanding results. “We have customers who’ve been with us for more than 15 years who’ve only needed a



A reverse osmosis water treatment solution for desalinating and fine filtration of boiler process water. Untreated water can lead to scaling and fouling, disrupting industrial processes and adding to the cost of operations.



Sizing a boiler water treatment and filtration plant based on accurate data yields better results than relying on guesswork, saving unnecessary expenses due to downtime and expensive repairs.



handful of acid washes – and in some cases, only one was necessary,” says Maasdorp. “They make sure the brine tank always has salt, the chemical tanks are topped up, and the dosing pumps work properly. They’ve been rewarded with lower servicing costs, less downtime and improved efficiency.”

Maasdorp explains that poor-quality feedwater can have devastating effects on boiler performance. Calcium, magnesium and silica scale can build up inside boilers, forming insulating layers that prevent heat transfer and reduce efficiency. “In electrode boilers, for example, scale can act as an insulator, preventing the current from passing through the water,” he says. “That means more fuel must be burned to produce the same amount of steam – and that’s money wasted.”

While some clients view water treatment as an unnecessary expense, Maasdorp encourages them to consider the broader perspective. “Yes, chemicals and maintenance have a cost, but the savings in fuel and reduced downtime more than make up for it,” he says. “We often compare our annual service and chemical costs with the savings we generate, and the numbers speak for themselves.”

The importance of ongoing care and maintenance

Allmech’s commitment to training and after-sales support helps clients stay on spec. “We commission every system we install, train operators and continue to support them through monthly check-ins,” he explains. “When staff change, we train the new team. We even use WhatsApp groups with some clients to help them troubleshoot on the go.”

His advice to companies? “Stick with a reliable partner rather than jumping between suppliers,” he says. “Keep records and photos of your equipment so you can track the impact of your maintenance regime. And most importantly, implement the recommendations you’re given. Following the system operating procedures isn’t just about ticking boxes – it’s about protecting your investment.”

www.allmech.co.za

Malben enhances e-coating and corrosion testing capabilities

With its state-of-the-art e-coating line and associated in-house laboratory for corrosion testing, Malben Engineering is driving continuous improvement, safety and corrosion protection for South Africa's automotive original equipment manufacturers (OEMs).



The 'closed loop' conveyor system guarantees repeatability in key areas, from ensuring that no process is omitted to achieving contact time repeatability, which is fundamental to quality and optimising repeatable coverage.

“**B**ecause of its constant drive to improve, it is a privilege to work in the automotive industry. Safety is an important cornerstone, and corrosion protection is part of this. Our success is built around pre-empting customers' requirements – and ensuring we are not a passenger in the process.

A genuine partnership is defined by taking the lead and adding real value and innovation in one's service offering, rather than just following,” says Luca Smargiasso, Operations Director of Tier 1 automotive component supplier, Malben Engineering.

When it comes to e-coating and powder coating, critical corrosion protection processes, Malben's standards are already significantly higher than those of its OEM customers. “Our state-of-the-art e-coating laboratory constantly analyses real-time data – and everything is managed via our design of experiments (DOE) methodology,” Smargiasso points out.

Investing in corrosion control

The coating of automotive components has evolved significantly since Malben launched in 1974. The company established an in-house plating plant in 1997 and, by 2001, had upgraded the facility to an alkaline, iron-zinc electroplating process. In 2005, Malben set up its e-coating and powder-coating lines.

“Over the last few years, we have enhanced our processes to improve our e-coating facility in line with our customers' enhanced corro-

sion protection requirements. More and more vehicles are being exported to highly corrosive environments. For example, a vehicle going into the Northern Hemisphere is going to be operating in a very demanding, corrosive environment, given the weather and the salt spraying done on those roads in winter,” explains Smargiasso.

Mirriam Ratlhogo, Electromagnetic Field (EMF) Plant Manager at Malben, explains that e-coating, electro-plating and powder coating resist chipping, scratching and corrosion.

A step-change in corrosion testing

Malben has invested in extensive in-house testing processes to access real-time data rather than waiting on third-party information: “This gives us a lot more flexibility. It enables us to analyse process improvement in short time frames and implement these changes quickly, which is important in an evolving environment,” Smargiasso continues.

Although more complex testing, such as cyclic corrosion, is outsourced, Malben's fully equipped e-coating laboratory can perform wet analysis, assess coating thickness and e-coat solids, and determine electromagnetic field process compliance with C2, C3, and 1P85 WSS standards. The salt spray chamber facilitates accelerated corrosion testing through continuous fogging. Manual tests include scratch and rub tests to ensure the paint is properly cured.

“Batch size sampling is essential due to the high volumes of components coated. During every nine-hour shift, tests are conducted five times. By working to its own higher specifica-

tions and standards, Malben has 'room to move' and quickly implement any adjustments required,” Ratlhogo explains.

Above and beyond

Malben recently engaged with another supplier to advise on process improvements required to achieve OEM standards, says Quality Director, Werner Kapp: “They wanted to understand what we were doing differently, as we had passed the corrosion test with flying colours.

“Furthermore, during one of our scheduled cyclic corrosion tests last October, we requested that a third-party laboratory continue testing for an additional five weeks, despite having met the stipulated nine-week cyclic corrosion test requirements. This demonstrates how Malben goes above and beyond to ensure corrosion protection excellence,” Kapp advises.

Technical precision

According to Ratlhogo, the conveyor system running from pre-treatment through to the curing ovens is also integral to the coating excellence achieved: “The 'closed loop' conveyor system guarantees repeatability in key areas: from ensuring that no process is omitted, to achieving contact time repeatability, which is fundamental to quality and to optimising repeatable coverage. The design of experiment-approved loading jigs also helps to maintain workflow and ergonomics,” she explains.

Head of Maintenance Quinten Ballot adds that attention to detail and careful monitoring set the company apart and give it a competitive edge: “On the e-coating side, everything is minutely monitored. What cannot be measured cannot be managed. Even the burner in the curing oven has been upgraded. Now AI-enabled, it constantly learns from its environment, adjusting to ambient/seasonal temperature variances to optimise heating patterns and gas usage, without compromising quality.

Thanks to ongoing investment not only in the e-coating facility and laboratory, but throughout the company, the lifting of the bar never stops!” Ballot concludes.

Despite a strong focus on supplying the automotive sector, Malben Engineering's products are also used in various other industries, including mining and the construction sector.

<https://malben.co.za>

Manufacturing at a turning point

Amith Singh, National Manager for Manufacturing at Nedbank Commercial Banking, argues that the competitiveness of the manufacturing sector in South Africa now depends on carbon intelligence.

South African manufacturers have earned their reputations through resilience, navigating energy disruptions, rising costs and unpredictable supply chains. But as 2025 draws to a close, it is clear that resilience alone is no longer enough. The next frontier of competitiveness is data – specifically, carbon intelligence.

The Nedbank-NAACAM Carbon Readiness Study, released in June, provided a sobering assessment of the preparedness or lack thereof of our manufacturing base. Nearly 70% of the country's automotive component manufacturers export to the European Union and the United Kingdom, where emissions reporting is now mandatory. Yet fewer than half have set a net-zero target, and only a small minority are tracking Scope 3 emissions across their supply chains. This gap is not just a technical oversight; it is a commercial risk, as global buyers increasingly screen suppliers based on carbon transparency.

Competitiveness, once measured by cost, quality and delivery, now includes a fourth metric: carbon. In October 2025, carbon traded at roughly R1 600 to R1 620 per tonne, up from an average of R1 320 per tonne in 2024. These figures mean that embedded emissions in every product exported to Europe now carry a tangible financial cost. Yet despite the price signals, many firms still lack the systems to measure progress. Cost pressures and uncertainty about what to track continue to stall action, and hesitation in this environment is expensive.

Some manufacturers are already breaking that pattern. A leading Tier 1 automotive supplier has recently become the first in South Africa to trial low-carbon steel in production, thereby cutting embedded emissions and aligning with international buyer expectations. While the premium for low-carbon steel remains high, early adopters are gaining access to future supply chains and strengthening their export market positions. Their example shows that carbon readiness is not a compliance burden but a competitive advantage.

The study also revealed how uneven progress in sustainability is reshaping competitiveness across South Africa. Export-oriented firms face the greatest exposure as their customer base lies in

carbon-regulated markets where disclosure is now a condition of trade. Every tonne of material, every kilowatt of energy, and every logistics decision now determines whether a business retains access to global buyers or fades from their radar.

This vulnerability is compounded by hesitation. Most companies understand the urgency of decarbonisation but struggle to move from intention to implementation. Cost constraints limit technical capacity, and the absence of clear reporting standards leaves even willing participants unsure of where to begin. Scope 3 emissions exacerbate this challenge: While many firms track direct energy use, few capture the indirect emissions that occur across their supply chains. Without this visibility, even long-standing firms risk exclusion from the value chains they helped build.

Water adds another operational risk. Nearly half of the surveyed manufacturers rely on municipal supply, and many report interruptions that raise costs and halt production. Sustainability, the study suggests, is no longer just about environmental responsibility; it is now a measure of operational resilience and long-term viability.

Financially, only a small fraction of companies allocate even 1% of their annual budgets to sustainability projects. This results in fragmented progress, where a few leaders surge ahead while others stall. The challenge is to convert awareness into coordinated action, linking finance, policy, and data so that readiness becomes the norm rather than the exception.

Nedbank's response has been to move beyond traditional banking and into partnerships. We help clients baseline their emissions, map financial exposure and design credible carbon strategies. Our carbon readiness toolkit, developed in collaboration with NAACAM, offers a structured pathway with diagnostics, benchmarks and step-by-step guidance on prioritising measurements. For small and mid-sized firms without sustainability teams or external consultants, this support can be the difference between staying competitive and being priced out of the market.

Policy will determine how quickly readiness spreads. At our June roundtable, the Department of Trade, Industry and Competition emphasised the need for incentives that help manufacturers transition



Amith Singh, National Manager for Manufacturing at Nedbank Commercial Banking.

while remaining competitive. Faster approvals for renewable projects, clear guidance on Carbon Border Adjustment Mechanism (CBAM) compliance, and export support tied to verified progress will be essential. At the same time, we must avoid protecting outdated business models at the expense of innovation. Congested ports, costly safeguard duties and delayed infrastructure upgrades all erode competitiveness while the world moves ahead.

Globally, manufacturing is being re-defined as governments invest heavily in low-carbon industries. The United States is reshoring clean technologies through the Inflation Reduction Act, while Europe is channelling billions into its Green Deal Industrial Plan. South Africa cannot afford to lag as demand shifts to regions that can demonstrate verifiable carbon performance.

Even so, the ingenuity, skill, and determination that define South African manufacturers remain unmatched. To achieve sustainability and profitability, the sector now needs coordination between banks and factories, as well as between policy and practice.

At Nedbank Commercial Banking, we are committed to driving that coordination because the future will not reward those who are stagnant. It will reward those who adapt first, measure what matters and design with a carbon-conscious world in mind.

<https://business.nedbank.co.za>

Championing sustainability across our communities

As the world increasingly recognises the urgent need for environmental responsibility, companies must look beyond compliance and embrace active stewardship. At EnviroServ, a SUEZ company, sustainability is not just a goal — it is a core value that drives action and community engagement.



To mark World Environmental Health Day, EnviroServ employees across South Africa, Mozambique and Uganda dedicated an hour of their time to clearing litter from the streets surrounding their operations. 1: Mozambique, 2: Rietfontein, Gauteng, 3: Shongweni, KZN; 4: Visserhok, Western Cape.

On 26 September 2025, to mark World Environmental Health Day, EnviroServ reaffirmed this commitment through a company-wide clean-up initiative during Environmental Awareness Month. Employees across South Africa, Mozambique and Uganda dedicated an hour to clearing litter from the streets surrounding their operations, demonstrating that even small, coordinated actions can make a meaningful difference.

The initiative has grown steadily since its launch in 2023, when employees contributed 759 volunteer hours, achieving 36% of the company's sustainability goal. In 2024, this figure rose to 765 hours, and for 2025, an ambitious target of 2 001 volunteer hours has been set — a target the team is confident it can exceed.

The clean-up at Rietfontein, Gauteng, was a standout example of collaboration. EnviroServ partnered with Komatsu and the Institute of Waste Management of Southern Africa (IWMSA), together collecting over five cubic metres of waste, of which 30% was recyclable. Such partnerships underline an important lesson for the industry: sustainability is most effective when shared across organisations and communities.

Esme Gombault, Group Technical Director at EnviroServ, noted, "This initiative is a shining example of what can be achieved when we work together towards a cleaner, healthier planet." Executives from both Komatsu and IWMSA echoed this sentiment, highlighting that their participation aligns with corporate values around sustainable practices and environmental stewardship.

Beyond the immediate environmental impact, initiatives like these foster a culture of sustainability among employees, partners and communities alike. They demonstrate that environmental responsibility is not limited to policy documents but is lived through tangible action.

For organisations across the waste management and broader environmental services sectors, the key takeaway is clear: championing sustainability requires vision, collaboration and active participation. By investing in programmes that engage employees and partners alike, companies can build long-lasting impact and demonstrate leadership in creating healthier, more resilient communities.

www.enviroserv.co.za

Paper packaging for sustainability and recyclability

The South African findings of the global 2025 Two Sides Trend Tracker survey on the print and paper industry confirm that paper-based packaging remains South Africa's preferred sustainable packaging choice.

With increasing pressure to reduce plastic waste and cut carbon footprints, the packaging sector is facing intense scrutiny, according to the Paper Manufacturers Association of South Africa (PAMSA). Paper-based packaging has emerged as a positive solution as it is made from renewable wood fibre from sustainably managed planted forests, and/or recycled paper fibre.

Overall, paper and cardboard emerged as the top choice among consumers who rated packaging materials based on 15 environmental, visual and physical attributes. In second place was glass, followed by plastic and metal, which were on equal footing. South African consumers value paper-based packaging for its recyclability, biodegradability/compostability, lower environmental impact, affordability, safety, and its ability to display clear product information.

In this year's survey, 64% of people said they prefer products ordered online to arrive in paper packaging, up from 58% in 2023. Additionally, 58% are actively taking steps to increase their use of paper packaging, while 80% expressed a preference for their online orders to be delivered in packaging that better suits their needs.

"We acknowledge right-sizing is not always possible for online retailers. The good thing about cardboard boxes is that they are fully recyclable regardless of their size, and welcomed by informal collectors and recycling companies," notes Samantha Choles, PAMSA's communication manager.

When it comes to being home compostable and biodegradable, 75% of respondents chose paper/cardboard. A further 53% selected it as the best material for the environment, and 51% found it the easiest to recycle.

Glass ranked the highest in reusability, look and feel and brand image, with plastic being the easiest to store. Metal packaging outstripped the other materials in terms of its strength and robustness.

The unsung hero of renewability

Choles acknowledges that paper packaging may not always fulfil the same function as other materials. However, in today's world, there is still a place for all packaging materials, provided they are produced and disposed of responsibly. She points out that the local and global forest products sector has, for many years, been exploring ways to utilise renewable materials like wood and cellulose, and to process by-products like lignin as substitutes for

materials that have a high environmental impact.

Choles goes on to explain that virgin fibre comes from farmed trees grown in responsibly managed and certified plantations. "These trees are considered renewable resources, with only 7-10% of 850 000 trees harvested annually and new trees planted in their place within a year. All of these trees are continually absorbing and storing carbon."

South African tissue and packaging manufacturers use recycled fibre recovered from used paper and packaging. "This further reduces waste and supports the circular economy," notes Choles.

The survey revealed that 65% of respondents believe that only recycled paper should be used in the manufacture of paper products. "The sole use of recycled paper in paper manufacturing is not possible, however," explains Choles. "Paper fibres can only be recycled around seven times, because the fibres shorten and weaken with each use. Without some new wood fibre from trees, the paper cycle cannot be maintained."

Recycling habits

In this survey, approximately 28% of respondents believe that more than 60% of paper and paper packaging is collected for recycling, up from 19% in 2023. "They are certainly correct. Our mills, with the help of informal collectors and recycling businesses, recover about 1.2 million tonnes of paper and paper packaging every year," says Choles. "It's good to see that 81% of respondents clearly understand what types of products can be recycled, and this is up from 78% in 2023."

Furthermore, 69% of respondents reported recycling their paper-based packaging, including delivery boxes, food packaging, and drinking cartons.

Responsible consumer behaviour

To reduce the consumption of non-recyclable single-use packaging, most respondents agree that the responsibility should be shared among governments, local authorities, brands, retailers and supermarkets. Notably, approximately 46% acknowledge that they, as consumers, bear the least responsibility in this regard. They express a strong desire for systemic change through the enactment of legislation, coupled with the commitment of brands and industry leadership.

This is backed up by 66% of South African respondents agreeing that non-recyclable packaging should be discouraged through taxation, with more than half stating they would consider



Paper-based packaging remains South Africa's preferred sustainable packaging choice. Photo credit: Detpak5



Cardboard boxes are fully recyclable regardless of their size. Photo credit: Corruaseal

avoiding retailers that do not actively try to reduce their non-recyclable packaging.

"It was interesting to note that 62% feel that brands, retailers and supermarkets are introducing more sustainable packaging, up from 54% in 2023," says Choles. She emphasises that local extended producer responsibility legislation fosters improved production design and recycling initiatives.

Paper packaging can meet practical and aesthetic needs, and it's easy to print, lightweight and versatile. "In an age of 'unboxing experiences' and where sustainability is central to brand identity, it's great to see that leading retailers and businesses are turning to paper to reflect their environmental commitments," concludes Choles.

www.twosides.info/trend-tracker-2025



Heavy lifting equipment runs on polymer bearings

World-leading polymer bearing manufacturer, igus, produces a wide range of polymer bearings that do not require external lubrication and are resistant to corrosion. This makes them ideal for environments where dirt, moisture or abrasive particles can quickly destroy traditional bearings. Manufactured from advanced, tribologically optimised polymers, they deliver minimal wear and a long service life, even under high loads, in applications such as lifting.

"In South Africa, we found that one of the key advantages of polymer bearings in heavy lifting equipment is their ability to operate reliably in 'dirty' conditions such as timber processing, construction and mining. Sawdust, sand or grit that might cause

steel bearings to seize or wear prematurely have little effect on polymer surfaces. This ensures consistent reduced downtime and significantly lower maintenance costs," says igus product manager, Juan-Eric Davidtz.

He adds that the versatility of polymer bearings extends across industries. They combine strength with lightweight design, resist chemicals, dampen vibration and can be tailored for specific load or temperature ranges. Importantly, they last longer than steel bearings in many real-world applications where lubrication is inconsistent or where contaminants are present.

"The adoption of polymer bearings in lifting equipment is all about educating

engineers and service technicians who are used to using steel bearings and lubricants, and are not yet aware of the higher performance abilities of our modern-day polymers. These are often much more durable and efficient, and, in some cases, a simple switch to polymer bearings can save companies hundreds of thousands of Rands in maintenance costs.

Wherever we work with companies to find solutions for their lifting equipment challenges, we have our customers' designers and operators comment that the machines operate more reliably and require less maintenance in harsh industrial environments," concludes Juan Eric.

www.igus.co.za

BricsCAD V26: The true CAD alternative



BricsCAD Pro V26 offers several unique capabilities that you "won't find elsewhere".

Bricsys®, a Hexagon company, has released BricsCAD® v26, which is now available and supported in South Africa by Chempute. This V26 version of the CAD software platform offers over 60 new features to enhance performance, productivity, and automation across design, manufacturing, construction, and surveying disciplines.

"Designers around the globe are becoming increasingly frustrated with rigid licensing, high cost, a lack of meaningful innovation, and bundling policies that force them to pay for features they don't need," says Cliff Brown, global product head for BricsCAD, in his launch presentation.

"They're not seeing the value of their investment and are actively seeking an alternative. BricsCAD is purpose-built to

be that alternative: streamlining design production processes by enabling immediate use of standard design formats, providing advanced editing and optimisation tools, automating drawing generation and ensuring that documentation output meets the production and construction communication standards that businesses demand," he continues.

"Smart, scalable and affordable, BricsCAD delivers real design productivity and altogether better value than traditional CAD software. It's not simply an alternative; it's the true CAD alternative," he asserts.

Unique capabilities "that you won't find elsewhere", he says, include:

- Drawing health capabilities to clean up DWG files, automate file optimisation and streamline design data exchange between teams.
- Innovative context-aware access to frequently used commands that adapt to what you're working on.
- Power tools that accelerate design editing, annotation and detailing in the model or paper space.
- Accelerated routines for key design and documentation workflows,

including new block definitions, enhanced block creation and management capabilities, advanced credit editing, more intuitive direct manipulation of design elements, and section plane manipulations.

- Improved tools for creating and managing section views, interference checking tools, new collision detection capabilities for 3D designs, attribute seeking and leader enhancements.
- Better annotation and data management performance: "V 26 handles even the largest files with speed and reliability, all backed by expert support and our commitment to your success," notes Brown.

"As part of our commitment to provide the solutions demanded by our clients, with V26, we've added the ability to edit 2D dynamic blocks created in AutoCAD. But going even further, we are thrilled to announce that BricsCAD now supports dynamic block creation as well. This represents a significant expansion of V26's compatibility and design capabilities," announces Chris Brown, before handing over to his technical team to unpack these new features in detail.

www.dwgcad.co.za



BricsCAD®

The true CAD alternative



Visit www.dwgcad.co.za

Cutting corners on HVAC leaves operators in the heat

Booyco Engineering, a specialist Original Equipment Manufacturer (OEM) of HVAC systems with over 40 years of experience in demanding sectors, is sounding the alarm on the risks of relying solely on kilowatt ratings when selecting HVAC solutions.

Brenton Spies, Managing Director at Booyco Engineering, highlights a growing trend where specifiers and procurement departments are using only an HVAC system's kW rating as a benchmark for selection. While this may seem like a straightforward approach, it often leads to complications on site, becoming apparent only once the equipment is installed and in full operation on a mobile mining machine.

"Not all HVAC systems with the same kilowatt rating are created equal," says Spies. "We are encountering cases where a unit is rejected for being 'too expensive' compared to other products with the same kW rating, only for the customer to discover later that the chosen system cannot cope with the site's actual ambient conditions."

The underlying issue, he explains, is that many buyers overlook critical international standards, ISO 5151, which defines the temperature classes to which HVAC systems are engineered. Known in the industry as T1

and T3, these classifications establish clear parameters for how equipment is expected to perform under various thermal conditions.

"Temperature class standards exist to guide the design, testing and validation of systems for specific environments," Spies explains. "The materials, cooling capacities and componentry of a T3-class HVAC system, for example, are engineered to handle far harsher conditions than those of a T1-class system. This makes a significant difference in high-temperature mining environments, where system failure is not just inconvenient but can compromise safety and productivity."

"Our air conditioning systems are ISO 5151 T3-rated, meaning they are designed to operate in ambient temperatures of at least 46°C, unlike many competitor systems, which are ISO 5151 T1-rated for just 35°C ambient temperatures," says Spies. "This higher rating ensures our products maintain the specified performance in extremely demanding environments. A system designed for T1 temperatures will not deliver the necessary cooling in T3 conditions, leaving the operator exposed to hazardous conditions."

Spies emphasises that cutting costs at the procurement stage by opting for a cheaper system based on kW rating alone can end up



Booyco Engineering warns that relying solely on kilowatt ratings when specifying HVAC systems can lead to underperformance in high-temperature mining environments.

costing operators far more in the long run. Unsuitable HVAC systems not only underperform in extreme conditions, but they are also more likely to suffer premature wear and require frequent maintenance or replacement.

He urges those responsible for specifying HVAC systems, particularly for mobile mining and earthmoving equipment, to consider environmental conditions and the applicable temperature classes as a fundamental part of the selection process. With climate conditions becoming increasingly extreme, especially in remote and open-pit mining environments, ensuring that HVAC units are fit for purpose is more critical than ever.

www.booyco.co.za

GEMÜ D41 diaphragm valve with EasyLock

Valve manufacturer GEMÜ, the global market leader in valves, measurement and control systems for sterile applications, has developed a valve as part of its new product generation. The GEMÜ D41 diaphragm valve features EasyLock technology.

This enables maintenance in seconds, reduces complexity and makes handling diaphragm valves significantly easier.

The pneumatically operated GEMÜ D41 diaphragm valve is specifically designed for use in aseptic manufacturing environments. The sealing concept of the valve is based on the newly developed GEMÜ diaphragm, which hermetically separates the actuator from the working medium. GEMÜ D41 with EasyLock technology is installed entirely without loose components via a central gearbox.

The GEMÜ D41 diaphragm valve, featuring EasyLock technology, is easy to handle, safe to use, and effective in its process.

EasyLock technology offers not only more reliable installation, but also even compression of the diaphragm.

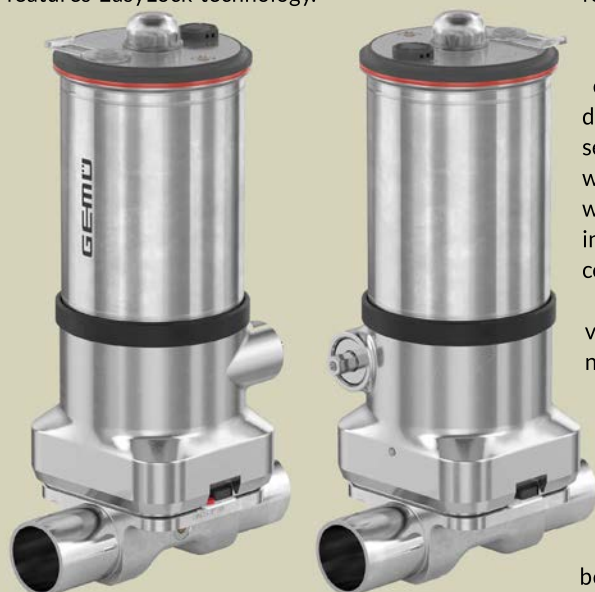
The actuator is fixed to the body via a bayonet fitting and then centrally tensioned via a gearbox, entirely without any loose components. This makes actuator mounting and disassembly,

commissioning and diaphragm replacement significantly simpler and quicker.

Furthermore, the diaphragm with a bayonet pin facilitates diaphragm replacement, while the new diaphragm technology offers greater safety and precision in plants. Due to the new seal system with fixed chambering, the natural setting behaviour of the diaphragm is controlled, making it unnecessary to retighten the diaphragm. The optimised rolling behaviour of the diaphragm provides better controllability and ensures low stress on the diaphragm, allowing maintenance intervals to be optimised for specific applications. The new body design not only saves weight but also provides a high and homogeneous flow characteristics. This enables the GEMÜ D41, as well as the already released GEMÜ D40 diaphragm valve, to achieve up to 100% higher flow capacity values (Kv).

The GEMÜ D41 diaphragm valve, featuring EasyLock technology, is a part of the LEAP generation of innovative products, which also includes: the D40 high-performance, pneumatic diaphragm valve; the S40 pneumatic globe valve, the P40, an efficient tank bottom valve, the 12A0, an intelligent electrical position indicator, and the GEMÜ 44A0, a multi-functional combi switchbox.

leap.gemu-group.com



The GEMÜ D41 diaphragm valve features EasyLock technology, enabling maintenance in seconds.

Smart infrastructure for a sustainable world



Chester Kan, Major Project Executive at Zutari
Chester Kan.

The conversation around infrastructure is no longer just about bricks, steel, and concrete. It is about creating systems that embody equality, resilience and innovation. These are the three pillars of the International Federation of Consulting Engineers (FIDIC) theme for 2025: 'Smart Infrastructure: Equality, Resilience and Innovation for a Sustainable World'.

At Zutari, with a legacy spanning over 90 years across Africa and the Middle East, we understand that smart infrastructure is not just about building; it is about shaping living legacies that uplift communities, catalyse economies, and prepare nations for the future. A powerful example of this is the Tshwane Automotive Special Economic Zone (TASEZ), one of the largest infrastructure programmes ever undertaken in the City of Tshwane.

Engineering against the odds

Appointed on the eve of South Africa's March 2020 lockdown, Zutari partnered with the Coega Development Corporation (CDC) to provide civil and structural engineering services for TASEZ. The mammoth task was to deliver all enabling bulk infrastructure (Stages 1 to 6) and the first phases of the supplier facilities.

The timing could not have been more challenging. With the global pandemic disrupting traditional workflows, supply chains, and stakeholder engagement, Zutari had to adopt an agile, digitally enabled approach to adapt. Virtual collaboration across offices, regions and organisations became the norm. The stakes were high, as Ford had to launch its new Ranger model on time or risk moving operations elsewhere.

The project demanded speed without compromising quality. Agile engineering practices and smart digital collaboration tools enabled Zutari and its partners to bypass conventional step-by-step project gates, instead delivering solutions iteratively. This 'digital-first' approach was a watershed moment in how infrastructure could be delivered under pressure.

Drawing on lessons from the development of Tshwane's Automotive City Special Economic Zone (TASEZ) in South Africa, Chester Kan, a major project executive at the infrastructure engineering and advisory firm Zutari, argues that infrastructure is not just about solving today's problems, it is about creating platforms for future growth, equity and resilience.

Equality in action: local empowerment

Beyond engineering excellence, the project was designed as a catalyst for socio-economic development. Zutari's work supported the creation of 1 131 local jobs, 908 training and development beneficiaries, 106 SMMEs that delivered 36% of the contract value, and R272-million worth of work packages executed by local businesses.

This was not a token effort. Project conditions required that at least 70% of the labour come from neighbouring communities, with a deliberate emphasis on employing women, youth, and people with disabilities. Contractors also had to prioritise local skills centres before seeking expertise elsewhere.

Training went beyond technical skills. Accredited courses included business ethics,

project management, SHE (Safety, Health and Environment) compliance, and financial literacy. This broadened the impact, creating entrepreneurs rather than just employees.

Resilience through skills and systems

Infrastructure resilience is not only about materials or design. It is also about ensuring that communities surrounding projects gain the skills to thrive long after construction is complete.

Through a comprehensive training programme covering trades such as bricklaying, plumbing, carpentry, electrical works and concrete construction, participants gained marketable skills. Non-technical training in business management and contract administration prepared SMMEs for long-term



Aerial view of the Tshwane Automotive Special Economic Zone (TASEZ).



Beyond engineering excellence, the project was designed as a catalyst for socio-economic development.

success.

By embedding resilience at both the structural and socio-economic level, TASEZ exemplified how infrastructure can withstand disruption — not only physical shocks but also economic and social uncertainties.

Innovation in collaboration

The TASEZ project was also a case study in collaborative innovation. Nine separate FIDIC-based contracts had to be executed, with varying degrees of overlap, requiring the alignment of Ford, the CDC, government stakeholders, suppliers and contractors. Zutari's role extended beyond engineering, as we facilitated digital-first project coordination, agile workflows, and knowledge-sharing practices that are now informing other infrastructure projects across the continent.

The successful delivery of TASEZ ensured that Ford's Ranger launch remained in South



Left: Resilient infrastructure means not just strong design, but equipping communities with lasting skills. Right: Zutari's work supported the creation of 1 131 local jobs, 908 training and development beneficiaries, 106 SMMEs delivering 36% of the contract value, and R272-million worth of work packages executed by local businesses.



Africa, securing billions in investment and positioning Tshwane as Africa's first 'Automotive City'. But the deeper legacy lies in the jobs created, the skills transferred, and the SMMEs uplifted.

At Zutari, we believe that smart infrastructure is not just about solving today's problems. It is about creating platforms for future growth, equity and resilience. Whether

it is a school, a bridge, a stadium, or a special economic zone, infrastructure should be both globally eminent and locally relevant.

The TASEZ project demonstrates that when infrastructure is smart, it does not just connect roads and factories; it connects people to opportunities, communities to prosperity, and nations to possibilities.

www.zutari.com

Global uncertainty and the human-centred approach

Teddy Daka, Group CEO at Zutari

Today, the delivery of infrastructure takes place in a world marked by increasing volatility. Global uncertainties such as geopolitical unrest, economic headwinds, climate-related disasters, and shifting social dynamics are no longer exceptional events; they are the environment in which we work.

This reality presents new challenges in managing risk. Traditional frameworks that treat risk as something to be controlled or contained are no longer sufficient. What is required is a mindset that embeds resilience at the heart of infrastructure, one that is human-centred, digitally enabled, and able to adapt to the unpredictable.

At Zutari, we believe engineers must move beyond a narrow focus on outputs to engage with the systems, communities and environments that give infrastructure meaning. Infrastructure is about more than concrete and steel. It is the platform on which people access opportunity, safety, dignity and belonging.

This human-centred approach is not an optional extra. It is fundamental to understanding risk management in the 21st century. When engineers understand what is truly at stake for those who will live with the infrastructure long after construction is complete, we are better equipped to anticipate challenges and design solutions that endure.

Resilience also requires a systemic perspective. We no longer design infrastructure in isolation, but as part of interconnected urban, social, economic and environmental systems. Drought affects the power supply, which, in turn, influences industry and livelihoods. A policy change shifts investment priorities and alters delivery pipelines. By recognising these interdependencies, we can design infrastructure that absorbs

shocks and continues to function even when parts of the system are under stress.

Technology plays an increasingly important role in this process. Digital advisory platforms, predictive modelling, and AI-driven asset management tools enable engineers to see further ahead and respond more rapidly. They transform risk from a reactive exercise into a proactive one, allowing us to anticipate failures before they occur, optimise asset performance, and build in flexibility from the start. Technology does not eliminate uncertainty, but it provides us with the tools to navigate it with greater agility and confidence.

Financial risk is equally pressing in today's high-debt environment. With strained public finances and private investors looking for certainty, projects must demonstrate more than technical soundness. They must show clear social and economic returns. This is where evidence-based methodologies such as Zutari's Greenlight come to the fore.

It allows us to quantify the social value that infrastructure delivers, whether through improved health, reduced inequality or greater resilience. The Greenlight methodology provides the confidence that funders and decision-makers need. Demonstrating value in this way makes projects more attractive to investors and increases their likelihood of withstanding financial uncertainty.

Risk is not confined to technical or financial domains. Political risk is a constant reality, characterised by shifting policies, misaligned stakeholder interests, and governance challenges that can be as disruptive as natural disasters. Engineers cannot afford to be passive in this environment. We must take an active role

in advocating for collaborative approaches that align diverse interests and perspectives.

This is one of the reasons Zutari is proud to be a strategic sponsor of FIDIC 2025. Sponsorship is not only about presence; it reflects our belief that global forums like FIDIC are vital spaces for building alignment across geographies, disciplines and sectors. These conversations help reduce uncertainty by creating shared agendas for infrastructure delivery.

Our own organisational models also reflect this need for resilience. Zutari EX, for example, is designed to export engineering expertise and create distributed teams that work across borders. It allows us to continue delivering projects even when mobility is restricted or when skills are scarce in a particular location.

Managing risk in today's world is about embedding resilience in every aspect of delivery. It is about placing people at the centre, leveraging technology intelligently, demonstrating financial and social value, and engaging in political and professional advocacy. Risk is no longer something to be avoided; it is the condition of our work.

As engineers, our responsibility is to ensure that infrastructure is designed not only to withstand disruption but to enable societies to thrive despite it. We must build systems that absorb shocks, adapt to change, and continue serving communities even in the most challenging circumstances.

Zutari embraces this responsibility. Through our projects, methodologies and leadership role at FIDIC 2025, we are committed to demonstrating what it takes to deliver infrastructure in uncertain times.

By combining empathy, innovation and foresight, we turn risk into possibility and uncertainty into resilience.

CSIR and Filament Factory launch nano-reinforced polymer composite

Filament factory, in collaboration with the Council for Scientific and Industrial Research (CSIR), has developed a groundbreaking nano-reinforced polymer composite that sets a new benchmark in advanced materials.



Left: CSIR-developed advanced nano-reinforced polymer composite pellets. Right: The advanced nano-reinforced polymer composite developed and produced for 3-D printing by Filament Factory.

An innovative nano-reinforced polymer composite material – developed by Filament Factory, in collaboration with the CSIR – delivers superior electromagnetic interference (EMI) shielding, enhanced radio frequency absorption in the RF, C- and X-frequency bands, and exceptional electrical conductivity, making it ideally suited for use in stealth technologies, medical implants and high-performance sensors.

“This collaboration marks a significant step forward in South Africa’s materials science capabilities. The nano-reinforced composite not only outperforms traditional materials but also opens doors for local innovation in critical industries such as aerospace, electronics and healthcare,” says Professor Suprakas Sinha Ray, Chief Researcher and Centre Manager: DSTI-CSIR Nanotechnology Innovation Centre.

The polymer composite is engineered to deliver unparalleled performance, combining exceptional strength with optimal functionality. Its unique structure and composition enable it to efficiently shield electromagnetic interference, making it a prime candidate for use as a radar-absorbent material. In addition, the integration of nanotechnology significantly enhances the material’s electrical conductivity, paving the way for conductive medical implants, sensors, and other electronic devices.

Moreover, it is available in both

granule and filament forms. The composite offers flexibility for various manufacturing processes, including injection moulding, extrusion and additive manufacturing (3D printing). The material’s lightweight nature and robust mechanical properties make it suitable for applications where weight reduction and durability are critical factors.

The composite’s exceptional radio frequency (RF) absorption properties make it ideal for reducing the radar signature of aircraft, drones and other vehicles for civilian purposes. It can also be used to create radar-absorbent coatings and structures for various applications, including military and civilian infrastructure.

Additionally, its biocompatibility and conductivity make it suitable for developing innovative medical implants, such as neural interfaces and cardiac pacemakers. Furthermore, the material’s sensitivity to electromagnetic fields and its electrical conductivity can be leveraged to create advanced sensors for applications such as environmental monitoring and industrial automation.

Potential applications include:

- **Stealth Technology:** The composite’s exceptional RF absorption properties make it an ideal material for reducing the radar signature of aircraft, drones, and other vehicles for civilian purposes.
- **Radar Absorbent Materials:** The material can be used to create

radar-absorbent coatings and structures for a variety of applications, including military and civilian infrastructure.

- **Conductive Medical Implants:** The composite’s biocompatibility and conductivity make it suitable for developing innovative medical implants, such as neural interfaces and cardiac pacemakers.
- **Sensors:** The material’s sensitivity to electromagnetic fields and its ability to conduct electricity can be leveraged to create advanced sensors for various applications, including environmental monitoring and industrial automation.

CSIR is committed to pushing the boundaries of material science and providing innovative solutions to meet the evolving needs of industries worldwide. The nano-reinforced polymer composite represents a significant step forward in the development of advanced materials with transformative potential.

Globally, the 3D printing market is concentrated in North America, Europe, and the Asia-Pacific region. Significant advancements in unpiloted aerial applications, electric vehicles, and the healthcare sector underpin the potential for 3D printing technology to expand.

“We intend to expand the portfolio of applications beyond imagination, and this is possible through national and international collaborations,” concludes Sinha Ray.

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Funding partners