



CAPE Business News

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FEBRUARY 2023

Polyoak fight plastic pollution



Effort wins award.

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Decarbonising environment through materials

An Aussie perspective.



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AA loads first dual fuel vessel

Cuts emissions by 35%.



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It's an ill wind...

THEY say that if you can't measure it, you can't manage it.

And while we all appreciate the consequences of having no electrical energy during periods of loadshedding, using what we do have efficiently and wisely receives little attention compared with having none at all.

CBN editor Robin Hayes interviews Alwyn Rautenbach, CEO of Iritron Group – a firm that specializes in the measurement and control of energy in its various forms, to discover how they have embraced energy recovery and found new applications for solar power.

Rautenbach explains the philosophy:

“The advent of loadshedding has focused the mind on using what energy we do have as effectively and efficiently as possible and the far sighted amongst us realise that we only use a fraction of the energy provided for a process or service, the rest simply goes to waste, especially when it's in the form of heat that can be recovered from exhaust gases for example.

“There is nothing that gets people thinking differently about energy than suddenly having to do without...”

By controlling and measuring energy in a process it soon becomes apparent how much energy is wasted that can be recovered and put to good use in lowering energy consumption and of course cost.

Combined cycle gas turbine generators are a good example where efficiencies and fuel consumption are vastly improved by recycling exhaust heat energy.



Alwyn Rautenbach.

This philosophy applies across the board and has led us into designing energy recovery systems that measure water quality or the exhaust gases from platinum smelters.

There is nothing that gets people thinking differently about energy than suddenly having to do without and the consequences to a business that formally accepted plentiful electrical energy as a given.

Our involvement with measurement and control of electrical energy usage has led us firstly into energy recovery projects and latterly into looking at ways where solar power can be put to good use in powering sophisticated ‘hi-tech’ processes.

Our geographic position of the globe presents us with an infinite source of ever present energy unlike the burning of a fossil fuel which once burnt is gone. Extracting every ounce of energy from fossil fuels such as coal, gas, petrol or diesel makes

complete sense but striving for increased efficiency involves an upfront cost which is quickly amortised in the process.

Our engineers have been involved in a multitude of energy recovery projects where the burning of alternative fuels have resulted in meaningful power generation – the burning of macadamia nut husks previously considered a waste product, allowed one client to generate 2MW of electrical power with the installation of steam raising plant, turbines and generators.

Similar wins have been achieved by the sugar industry in the burning of bagasse - the waste product from sugar manufacture.

Extracting heat from process exhaust gases once cleaned or scrubbed has led to meaningful power generation in a number of industries.

Our obsession with the measurement and control of energy has led us into the establish-

ment of a new solar division that examines how solar power can be put to effective use in industries as diverse as mining and agriculture.

In addition to the now conventional roof mounted solar panels, batteries and inverter technology, we have developed solar trailers – tow behind units that feature solar panels and control systems that can provide remote power supplies using only the sun as the energy source.

These have found a market in open cast mining where remote / robotic drilling platforms used for the placing of explosives are connected remotely via wi-fi to a single controller, physically located kilometres from the actual site. This remote working prevents personnel being exposed to potential safety issues coupled with more efficient mining operations.

Our solar trailers have also found an application amongst wine growers who traditionally have had to harvest crops at night when temperatures are lower, leading to less spoilage of the crop. With our solar trailers powering refrigeration equipment, harvesting of grapes can now take place in daytime without spoilage of the crop.

A similar application is found amongst the hunting fraternity allowing the on-site cooling of kill carcasses to preserve the quality of game meat.

We expect great things from this new division with a number of new applications presenting themselves virtually everyday. A good example being the unfortunate culling of 10 million chicks at a chicken producer premises where loadshedding interfered with the production cycle and strict temperature controlled environment.

“It's an ill wind that blows nobody any good...” he concluded.

12 months of EPR



Credit: Wikipedia, Creator: Eric Vance.

JANUARY 2023 marked the end of the first full year of Extended Producer Responsibility (EPR). As the packaging industry awaits the results of its baseline performance against the legislated collection and recycling targets, there is broad consensus that much more work is required to meet the increasing targets to 2027.

As modelled in the CSIR's recent Waste Research Development and Innovation Roadmap Report (November 2022), achieving the EPR targets has the potential to mitigate 14% of greenhouse gas emissions between 2023 and 2040 (compared to business-as-usual projections), due to the partial replacement of virgin plastic with recycled plastics. The report also notes that mechanical recycling processes in South Africa favour rigid, mono-materials from a technical perspective. In practice, however, increased recycling also requires a heightened demand from manufacturers to include more recycled plastic in large-scale end-use applications that have a high rate of churn, such as packaging, to truly make an impact.

According to Plastics SA (2021) plastic products in general in South Africa contain an average of 16.7% recycled content. However, rigid packaging contains only 12% recycled content, which is low, especially compared to 27% for flexible packaging. Whilst food grade post-consumer recycle (PCR) is not yet widely available, there ex-

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2023 Skills Development submission

IT is time to submit your annual Workplace Skills Plan/Annual Training Report again. Do not delay and start early with your preparations to ensure a successful submission for your company.

Companies can qualify for skills development incentives by submitting an Annual Workplace Skills Plan (WSP) and Annual Training Report (ATR). By submitting this report, businesses will benefit in the following ways:

- qualify to claim back a 'mandatory grant' of 20% of your Skills Development Levy (SDL);
- maximising points earned under the Skills Development priority element for BEE;

- highlighting skills gaps in your organisation - the difference between the skills required for a job and the skills employees actually possess;
 - implementing training to minimise these skills gaps; and
 - applying for 'discretionary grant' funding to address 'critical and scarce skill shortages' identified in your industry.
- The deadline for the submissions is 30 April 2023.
- NEASA can assist you to compile and submit these reports to the relevant SETA's.
- For assistance, email schalk@neasa.co.za or call on 012 332 5350.

12 months of EPR

Continued from P1

ists a multitude of quick win opportunities for PCR inclusion in large-format, rigid plastic packaging for non-food applica- try stakeholder col- Separation of waste at source and improved waste collection are critical to unlocking PCR projects; and it is important to manage brand owner's expectations around the aesthetics and technical performance of PCR.

Overhead cranes move toward full automation



Marc Kleiner.

GROWING awareness of the benefits of full crane automation is currently the most noticeable trend in Africa's overhead crane industry.

This is according to Marc Kleiner, managing director of local crane manufacturer Condra, where records show a significant increase in the number of tender documents specifying provision for crane automation post-installation.

He was commenting on market characteristics emerging during the year just ended.

Kleiner said that although Condra received no orders for fully automated cranes during 2022, the number of enquiries for such machines was well up year-on-year.

"Repetitive crane operations such as those in refinery operations offer clear potential for increased productivity through automation," said Kleiner. "South Africa has the technology and local manufacturing capability to deliver it, and now the market is becoming increasingly aware. I don't think we will have to wait long before automation gains a foothold."

Full automation implies zero involvement by machine operators. It is the ultimate step beyond an overhead crane in which the machine executes a limited number of pre-

programmed, automated operations, but still needs an operator to control the crane during randomised, non-repetitive lifting functions (semi-automation).

Kleiner stressed that Condra has offered full automation across its product range since 2020, the culmination of continuous development since the company's first semi-automated crane installation at a Durban spice company in 2003. That machine comprised a grabbing crane installed to pick spices and transport them to specific points for release over hoppers servicing blending and packing operations.

Pointing to the motor industry for indicators of anticipated advances in overhead crane technology, Kleiner said that motor vehicles often led technological development in crane manufacture by several years, but that in the case of automation these roles had been reversed, with overhead cranes currently leading the way forward.

"Vehicle manufacturers were first to use computers to monitor certain mechanical functions," Kleiner explained. "Crane manufacturers lagged this development, and it was a similar case with the control and smoothing out of lifting and lateral movement. It took time for crane manufacturers to introduce variable

"I don't think we will have to wait long before automation gains a foothold"

speed drives, whereas comparable control technologies had been present in motor vehicles for decades.

"This is not the case with automation, however. With automation, the crane companies are in the lead," Kleiner said. "The autonomous crane exists and is already performing useful work, whereas the autonomous motor car is still in the experimental phase."

Kleiner noted that about one in five enquiries received by Condra now includes specified provision for future automation, a requirement met by incorporating wheels and rails with tighter tolerances, and provision of fitment and wiring points for the future attachment of cameras with cognitive movement control ability, the main requirements for automation.

Asked about other trends in the overhead crane industry emerging during 2022, Kleiner pointed to the fragmentation of the market into two main types of supplier: those delivering specification-driven overhead cranes of the highest possible quality designed and manufactured to fulfil a specific customer function, and other companies importing lower quality machines for shoehorning into the application.

"There are still companies out there hoping to make a quick fortune," said Kleiner. "They don't manufacture locally, so they buy the closest suitable standard machine abroad with an eye getting the job done in the short term. They are not looking to the long term, and these types of cranes generally fail early on under the stress of the application."

Kleiner noted that this trend has been exacerbated by the formation of small, splinter companies resulting from the downsizing of some of South Africa's key multinational crane manufacturers.

"Retrenched staff frequently form small start-ups allied to an external manufacturer in Europe or China. They supply a standard machine, the engineering of which often fails because the design is not suitable, forcing the supplier to redesign and rectify after commissioning with a consequent halt to the customer's production," he said.

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BEARINGS International, has launched its online store at shop.bearings.co.za, has a broad product portfolio that provides cost-effective solutions for water treatment applications involving pumping. Complete solutions range from electric motors and Variable Speed Drives (VSDs) to bearings, seals and lubrication to power transmission.

Special requirements for products used in the water and wastewater treatment sector are a high IP rating as they are exposed

to constant elements such as rain and dust. In addition, potable water requires a food-grade level of lubrication quality.

Other products for the water sector include V belts and pulleys, sprockets and chains, couplings and gearboxes. BI is the authorised distributor for quality brands such as FAG, Koyo, Cooper, ABB, Rexnord, KOBO, Linkbelt and Continental. It has a range of ABB electric motors available through its extensive countrywide branch network.



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"The demand for clean water will continue to increase as more and more people move to cities due to urbanisation," comments Bearings International General Manager Chris- tian Chipamaunga. Increasingly stringent regulations for water and wastewater treatment have seen a significant investment in new treatment technologies and processes.

PCR bucket and drum overcomes technical challenges

POLYOAK Packaging is one of the leading rigid plastic packaging suppliers in Southern Africa and its commitment to maximising post-consumer recycle (PCR) in its high density polyethylene (HDPE) drums and polypropylene (PP) buckets, wherever possible, to help fight climate change and plastic pollution.

Contan's Multilayer PCR Bucket

Polyoak invested in specialised multi-layer technology imported from abroad, to launch South Africa's first multilayer bucket containing over 40% PCR! Its specialist bucket division, Contan, based in Roodekop (Gauteng), launched its award-winning Multilayer PCR 20L Bucket with the paint and coatings market in July 2022.

The feedback has been extremely positive, with brand owners embracing the chance to include recycled polypropylene (rPP) in their buckets without having to compromise on critical technical

performance or visual appearance and branding on-pack.

This necessitated a bucket design with multiple layers, where every layer is comprised of the same material (polypropylene) to enable maximum recycling.

Including PCR in single layer buckets is problematic, in that it weakens certain technical properties of the plastic and reduces the bucket's technical performance including impact strength.

Another challenge with injection moulding PCR from an unknown source is the variability when it comes to melt flow rate and shrinkage. This is crucial when fitting a lid to a rim as there is no margin of error, or else the bucket will leak or allow gas exchange. Therefore, the lid and rim are also injection moulded using virgin PP.

Therefore, Contan's technical team designed the bucket to utilise virgin PP for the inner and outer layers, so as not to compromise the critical technical performance of the

container.

Isolating the PCR in the middle layer and using virgin PP for the outermost layer, overcomes the challenge of colour matching. Any colour PCR can be used for the middle layer, whilst brand owners can add any colour to the outside layer of the bucket.

All the same decoration options available for a virgin bucket, are also available for the Multilayer PCR Bucket, including in-mould labelling, off set and digital print.

At the same time as commissioning its new Multilayer PCR Bucket, Contan added direct digital printing as a decoration option for all bucket sizes. This allows for efficient short print runs, zero origination fees, artwork flexibility and faster response times with no label stock holding. This is a major advantage given the trend towards product customization within the industry.

All this earned Contan's Multilayer PCR Bucket the prestigious title of "Overall

Packaging Winner" at the recent Gold Pack Awards, in addition to winning the overall Plastic Packaging and Industrial Packaging award categories. Internationally, Polyoak's innovative multilayer PCR initiatives, its Contan bucket and Blowpack drum, both achieved World Star Awards, announced in January 2023.

Polyoak Packaging's Managing Director, Karl Lambrecht adds, "We are extremely proud and thankful to our customers for partnering with us on these PCR projects. The fact that recycled polypropylene has 70% lower global warming potential than virgin polypropylene, and that this bucket contains 40% PCR, is a huge win for the environment. This project will create a demand for recycled polypropylene back into packaging which has not existed up until now. To top it off, our bucket manufacturing plant is powered by enough solar energy to reduce carbon emissions by 1,870 tons per annum!"

Blowpack's Multilayer PCR Drum

Polyoak invested in multi-layer extrusion technology, imported from abroad to support its drive to grow PCR content in its packaging, wherever possible. Its specialist industrial blow moulding division, Blowpack, initiated and launched its award-winning 20L Multilayer PCR Drum project in partnership with its customers in the chemical and agricultural space.

The middle layer of the drum comprises post-consumer, recycled, high density polyethylene (rHDPE) which has 70% lower global warming potential than virgin HDPE.

This significantly reduces the drum's carbon footprint and drives demand for HDPE recycle which, in turn, increases the collection and recycling of drums at end of life to advance Circular Economy. The end-result is less plastic pollution and landfilling, and more economic opportunities for South Africa's recycling community.



Contan's new 20L multilayer bucket with 40% PCR took top honours at the Gold Pack Awards.

The interior of the drum is moulded using virgin HDPE to mitigate the risk of contamination and chemical reaction, to protect the integrity of the contents and guarantee its safe containment. This is because PCR has somewhat diminished technical properties and greater variability in performance compared to virgin plastic.

Sealing the recycled plastic in the middle layer enables production of higher quality drums on a more consistent basis. The middle layer of PCR may be dark in colour to serve as a barrier to

help protect light sensitive contents.

Blowpack's Multilayer PCR Drum is UN Certified to retain its technical functionality with up to 30% rHDPE inclusion. This was a major achievement given that PCR reduces a drum's top load capability.

The fact that recycled HDPE is not yet food grade, adds complexity to operations and requires additional control points be put in place to prevent contamination with any food grade material run in the same production plant. This was another important aspect of the project.

SMEs to benefit from fuller e-com solution

SHIPPING may not be the most attractive aspect of e-commerce, but it's certainly among the most important in a sector that FNB Merchant Services anticipates will reach R400-billion in South Africa by 2025.

Numerous studies have shown that effective delivery is a key influencer in a shopper's decision to make an online purchase or not. And as much as delivery strategies have improved, some consumers remain sceptical that their goods will reach them on time, or even at all.

The onus is now on small and medium enterprises (SMEs) to remove these doubts if they hope to grow their businesses.

"For merchants, shipping is likely to be one of the major factors they need to consider, both in terms of operations and costs," says Anita Erasmus, Head of Busi-

ness for Bob Group, an ecommerce ecosystem aimed at making ecommerce reliable, simple and trustworthy.

The group is an amalgamation between online auction and marketplace brand bidorbuy and logistics firm, uAfrica.

Erasmus says while courier companies are good at collecting parcels and getting them delivered, "there is so much more to it" when it comes to ecommerce.

"Setting up a successful ecommerce store is a multifaceted undertaking, requiring not only creating the store but also functions like payments, shipping and marketing. Bob Group's aim is to assist merchants in areas where we believe we can make this process easier.

"Initially, our focus is on the marketplace, payments and shipping but we have exciting new developments planned for 2023."

Bob Group through uAfrica specialises in automated technology that facilitates this process, many aspects of which were previously done manually. The system allows SMEs to get competitive quotes and ship from multiple couriers while also enabling them to generate electronic shipping labels with one click to request collections from multiple couriers. Features like packing slips, bulk fulfilment and inventory management are also available to streamline the order management process.

Automated tracking updates also ensure customers are always up to date on the status of their parcels.

"Ultimately, shipping success comes down to innovative technology and tight integration between your online store and the courier companies you use," Erasmus says.

Such technology

should be especially useful to South Africa's township and rural economies.

The Covid-19 pandemic has led to a significant increase in the variety of products being offered online, with major growth in the clothing, food and cosmetics sectors.

While ecommerce uptake had initially been slow, it's now surging. The 2022 South African Township CX Report, released in June, found that 70% of the 1,400 people surveyed made a purchase online in the past year. In the inaugural 2021 report, that percentage stood at just 28%.

Township-based clothing brands have sprung up and are thriving. The report found that most surveyed preferred buying locally-produced clothing labels, and with that has come greater demand for the items beyond the townships.



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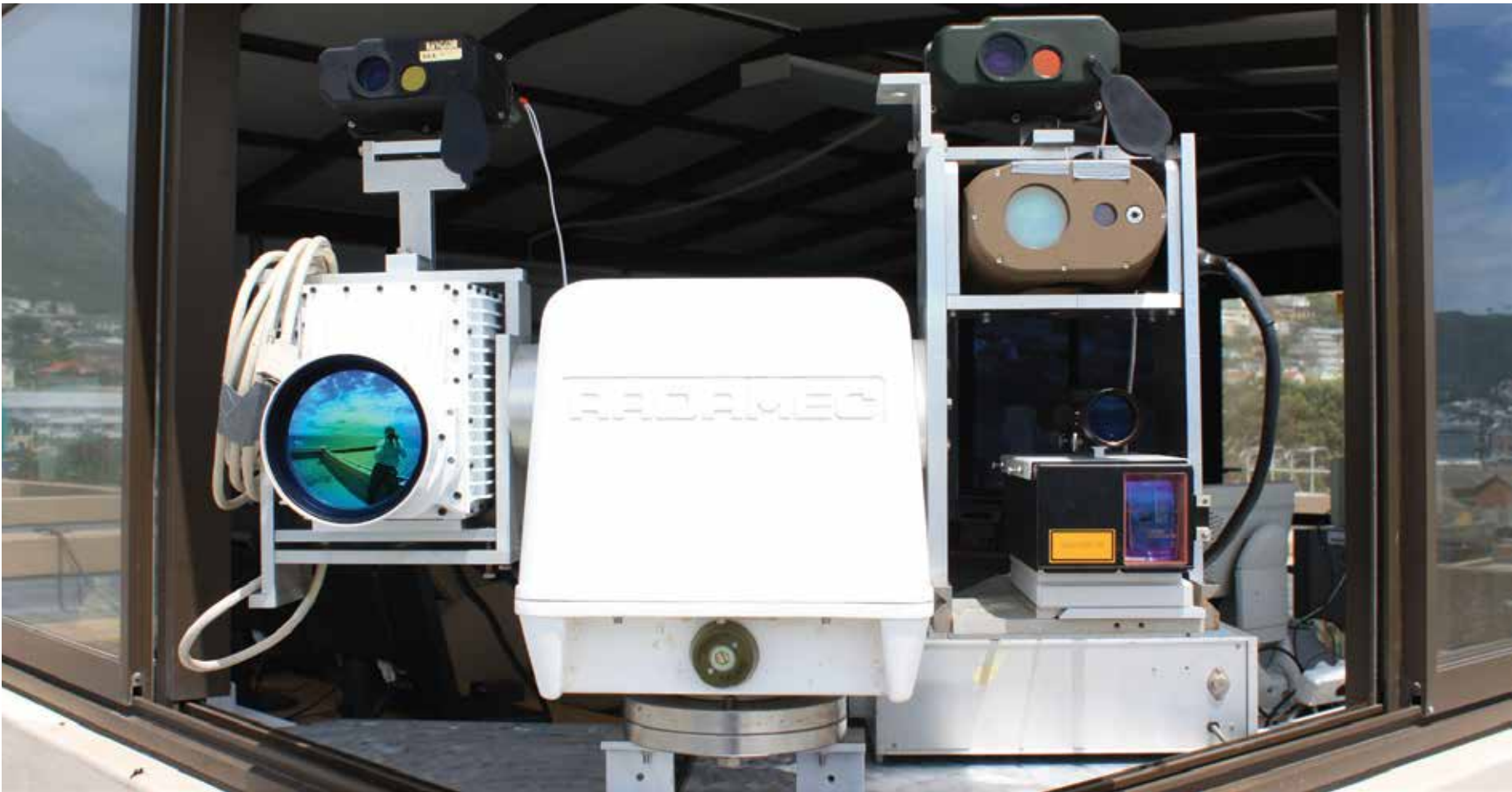
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The Institute for Maritime Technology (IMT), a subsidiary of Armcor, is an accredited world-class facility strategically providing science-based technological and engineering support to the South African Navy and other members of the maritime community locally and globally. With close to 50 years' of success, IMT is an ISO 9001 accredited organisation located in Simon's Town, Western Cape; specialising in maritime technologies, sciences for military defence applications, defence research, development, testing and evaluation of maritime systems for the defence and commercial sector.

WHY CHOOSE US

IMT is renowned for its capabilities and delivering value to its customers. The facility boasts modern well-equipped workspaces, including laboratories, workshops, test platforms for boats, Autonomous Underwater Vehicles (AUVs) and Unmanned Aerial



Vehicles (UAVs). The Institute uses cutting-edge hardware across its premises, including sensors, instruments, research equipment and information technology systems. IMT professionals are highly competent and are its competitive advantage; involved in research, development, data gathering, analysis, and interpretation in addition to operating and maintaining the equipment and facilities.

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IAS partners with Compressor & Engine Engineering to pursue rail market

INTEGRATED Air Solutions (IAS) have announced the appointment of Compressor & Engine Engineering (CEE) as their exclusive distributor for the ELGi compressor range that is tailored specifically to the local railway industry and allied sectors. Integrated Air Solutions is the exclusive regional sales and service partner in South Africa for ELGi Equipment, including electric and diesel-driven compressors.

"The premium ELGi brand positions us as one of the country's leading suppliers of quality air solutions to an extremely wide range of market sectors including mining, construction, engineering, cement, pharmaceutical, automotive, food & beverage, agri-processing, water well, and oil & gas exploration," notes Graham Russell, GiGi CEO.

ELGi also offers a range of air compressors that are specially designed and engineered for the railway industry include compressors suitable for diesel and electric locomotives, supply air for a variety of applications including the powering of braking systems and the positioning of pantographs on the roofs of electric trains. "Globally renowned for their robustness and reliability, these compressors are designed to meet the harsh conditions typical of the rail environment," states Integrated Air Solutions Managing Director, Wayne Jacobs.

"Compressors fitted on the under carriage for example, have to be particularly rugged in order to withstand punishing conditions such as high temperatures, vibration and dust."

"As the railway sector is a new market for us, we decided that our best route to market would be to partner with a like-minded company that has a well-established reputation and in-depth experience in this segment," comments Graham. "CEE, one of our long-standing customers, proved to be just such a company that ticked all the right boxes." Spearheaded by Managing Director, Gavin Acar, and

founded by Gavin's father, Leigh Acar, in 1989, CEE is a leading manufacturer and refurbisher of components for the locomotives industry. Both Graham and Gavin, as successful entrepreneurs, recognised the mutual advantages of a partnership between their two companies.

CEE specialises in the refurbishment, repair, maintenance and sale of locomotive compressor and vacuum systems for trains operating on mines. The Compressor Division focuses on the sales, service and repair of all makes of rotary screw, rotary vane and reciprocating compressors. "Our turnkey air services also extend to installation and commissioning, scheduled maintenance programmes, compressed air requirement analysis, compressor room layouts and piping installation," affirms Gavin. The manufacturing of locomotive and vacuum brake components as well as the refurbishment of diesel compressors is handled by the Engineering Division. The company also houses a Filtration and Locomotive division.

Highlighting a fur-



Wayne Jacobs, MD Integrated Air Solutions (left) & Gavin Acar, MD Compressor & Engine Engineering confirm their partnership agreement.

ther value add for the distributor partnership Wayne says, "Certain ELGi compressor parts and spares are interchangeable with non-ELGi machines, giving us a definite market edge. If an air compressor has reached its end-of-life, CEE is able to offer the customer a brand new ELGi machine, a win-win for

both companies!"

CEE will initially hold stock of fast moving and critical machines and components with the possibility of future expansion as determined by emerging trends. The skilled CEE team is responsible for all maintenance and repairs of ELGi Rail compressors.

Hybrid cables save installation space

MOTION plastics and cable manufacturer, igus, has introduced its new ready cable hybrid cables suitable for drive technology from Siemens and SEW-EURODRIVE.

Save installation space and weight with just one cable for power and data: it's easy with harnessed igus ready cable hybrid cables. New to the range are ready-to-connect cables suitable for SEW-EURODRIVE with MOVILINK DDI and Siemens SINAMICS S210 with OCC. In addition to PUR, the latter is also available with an outer jacket made of cost-effective PVC. Macros for the EPLAN Electric P8 software speed up cable planning by around 50%.

Reducing the complexity of automation solutions while saving money, time and installation space is a declared goal of engineers all over the world. This applies to cable planning as well. Here, so-called hybrid technology has become one of the major trends in recent years. While servo drive systems used to require several cables to transmit energy and data, hybrid cables simply combine the cores.

"Hybrid technology is a pioneering development that we, as a cable specialist, are one hundred percent convinced is the way to go," says Ian Hewat, managing director of igus South Africa. "We are therefore continuously expanding our portfolio of ready-to-connect hybrid cables from the ready cable series in order to offer



igus is expanding its product portfolio of harnessed hybrid cables, adding ready-to-connect cables suitable for SEW-EURODRIVE with MOVILINK DDI and Siemens SINAMICS S210 with OCC.

our customers a fast, reliable, cost-effective solution for continuous use in energy chains."

The latest addition to the ready cable series includes two models: a hybrid cable for motors from SEW-EURODRIVE, a German manufacturer, with the MOVILINK DDI interface, and a hybrid cable for Siemens servo drives suitable for SINAMICS S210. In addition to PUR, the outer jacket can be made of the lower-cost polyvinyl chloride (PVC).

To save even more project planning time, igus also provides direct links to the macros for the EPLAN Electric P8 planning software on their website. This allows the cables to be dragged and dropped into the digital cable plan as building blocks, reducing cable planning time by up to 50%. Like all cables in the ready cable series, the new hybrid cables have a strong outer jacket, a strain-relieved core, movement-optimised

stranded wires, a stranded structure with a short pitch length and a gusset-filling extruded inner jacket.

"This design and these high-quality materials make our new hybrid cables fail-safe in continuous use in energy chains, even in compact applications," says Ian. Materials with good electromagnetic compatibility prevent the energy and data transmission cores from having a negative influence on each other. All models have undergone several million test cycles in the 3,800 square meter igus test laboratory. igus therefore offers an above average chainflex cable guarantee of 36 months. They also provide an online tool, with which customers can calculate the expected service life of their specific application.

igus South Africa, Ian Hewat, managing director, Tel: (011) 312 1848, Fax: (011) 312 1594, Email: ihewat@igus.net, Web: www.igus.co.za

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Upskilling - a win-win solution

By Phemelo Segoe

THE matric pass rate says a lot about the health of South Africa's education system. As an indication of the learners who successfully pass Grade 12, it offers insight into whether primary and secondary institutions are serving the needs of their learners, and provides an indication of the number of new graduates who may apply for tertiary studies or enter the job market. This figure doesn't tell the full story, however.

On 20 January, the Department of Basic Education will announce the results of the matric class of 2022. Whether these figures point to a recovery in the wake of the pandemic remains to be seen. Between 2019 and 2020, the pass rate fell by over 5% to 76.2%, and its gains in 2021, by a mere 0.2% percentage points, were so small as to be virtually insignificant.

What's more, researchers feel that the pass rate alone doesn't reflect the full status of education in South Africa. The "true matric pass rate", they argue, has to consider the dropout rate. How many learners who started in Grade 1 failed to matriculate 12 years later? The Department of Basic Education puts the dropout rate at between 42 and 56%. The Zero Dropout Campaign puts it closer to 63%, estimating that only 37% of Grade 1 learners ultimately pass Grade 12.

In 2020, the Department of Higher Education and Training cal-

culated that less than a third of South African adults, some 32.5%, had a matric certificate or its equivalent.

With a matric still serving as the most important qualification for job seekers, these numbers paint an alarming picture. They point to the many millions of South Africans who cannot find employment — the country continues to have one of the highest unemployment rates in the world — and who cannot break inter-generational cycles of poverty.

How can we overcome this? How can we support not only the learners who don't pass in 2022, but also those who didn't pass in 2021, in 2020, and the many years that came before?

The answer to this question isn't an easy one. Pointing fingers in any one direction is reductive and counter-productive.

In a country like South Africa, which is beset by many complex socio-economic and political issues, it's best to view responsibility for addressing these problems as shared. Government has its role to play, yes, but so too does civil society and the private sector.

If we look to business, it's clear that there are a variety of advantages available for companies that make the effort to support new and future employees who don't have a matric. One of the most obvious of these relates to the B-BBEE Scorecard.

Businesses that offer skills development programmes for low skilled employees and unemployed commu-

nity members stand to earn up to 25 points towards their B-BBEE Scorecard. Companies with more than R50 million turnover need to spend 6% of their payroll on skills development to qualify.

These skills development initiatives can take a variety of forms, namely the Amended Senior Certificate (ASC), Adult Basic Education and Training (ABET), now known as Adult Education and Training (AET) and finally, learnerships are particularly valuable. With an ASC, learners have a qualification that is recognised as the equivalent of a matric.

Through AET, adults who fell off the academic wagon sometime before Grade 9 have access to formal education and through learnerships, employees can gain practical work experience and earn a living while they complete their qualification. Additional B-BBEE points are made available for companies that hire these learners full time once their learnerships are complete.

Upskilling employees who do not have a matric, or helping new recruits to complete their matric before they come on board, offers a variety of real and tangible benefits. It not only gives individuals a new chance to further their careers and earning potential, but it also helps businesses to grow and thrive, and has the potential to improve South Africa's economic prospects over the long term. ce, one of South Africa's education and training providers.

Oil adulteration a big risk to SA's fuel security

By Mpho Dipela, Director and Shareholder of Royale Energy.

IN June last year, the Mineral Resources and Energy department raised the alarm on diesel-paraffin mixtures being sold as diesel at some petrol stations, confirmed by samples collected. The department also noted that imports of illuminating paraffin have increased significantly over the past year. As a result, it is currently working on a marker to ensure greater traceability of paraffin in diesel.

The price of diesel at the pump is not regulated in South Africa and therefore will differ. However, the source of the product is mostly the same, being locally refined or finished product imported by the oil majors. This means that it is not uncommon to find differences in diesel pricing even in rural areas.

The price is not just

dependent on the cost of crude oil, but also on domestic demand. This is because all imported diesel passes via various retail stations and depots before finally making its way onto the nation's roads. But some retailers sell the diesel at much higher margins as the product may not be 100% diesel but instead mixed with paraffin.

The addition of a liquid fuel such as kerosene or illuminating paraffin to diesel is known as adulteration. This produces an inferior quality product that can damage vehicles, reduce their efficiency and increase the emissions of harmful pollutants. Mixing paraffin with diesel to sell to unsuspecting customers is therefore illegal and service stations found with adulterated diesel could face immediate closure and prosecution.

However, the South African Petroleum Retailers Association (SAPRA) has reiter-

ated government's warnings about increasing instances of criminality at the pumps, reporting at least 200 cases of illicit trading since November 2020 which include diesel adulteration — especially in Limpopo and Mpumalanga.

According to the South African Petroleum Industry Association's long-term sales data, which represents the major petroleum and liquefied petroleum gas companies in the country, the base consumption of illuminating paraffin in the country was roughly about 600,000 kilolitres per year. Over the past three years, however, it has doubled to reach some 1.2 million kilolitres per year.

The number of people using paraffin for cooking and lighting has not doubled, in fact with an increasing number of people living in poverty; we should be seeing a lower demand for this fuel.

Where all that extra paraffin is being used, points to increased levels of oil adulteration. The scale of the problem has now reached a critical level and needs to be addressed immediately.

Government's interventions to curb this trend are a step in the right direction, such as police investigations using a "marker" to ensure greater traceability of paraffin in diesel. These intervention markers are inserted into paraffin, and if the paraffin is mixed into diesel the markers are able to pick it up. SARS officials are now also able to use handheld devices to detect the presence of the marker.

(I would have thought that it would be a fairly easy matter to identify fuel stations that are cutting diesel with paraffin, as the volumes of diesel supplied would see a drop from normal. That is if the suppliers of fuel are not themselves implicated in the scam. Ed)

CCSA updates important manual on construction of concrete roads

CEMENT and Concrete SA (CCSA) has published a third and updated version of its highly respected manual, "Concrete Road Construction", authored by Bryan Perrie and Dennis Rossman, two of South Africa's leading authorities on concrete pavements. Perrie is CEO of CCSA, and Rossman is a retired SA National Roads Agency (SANRAL) executive.

Originally published by a CCSA predecessor, the Cement & Concrete Institute, "Concrete Road Construction" has for the past 13 years proved invaluable to contractors and supervisory staff with the construction of concrete roads using the most modern slip-form paver or rudimentary equipment for low-volume township streets.

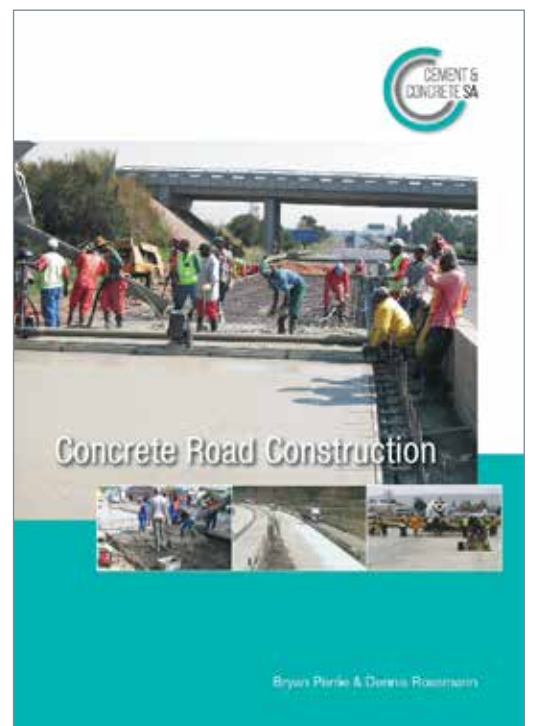
In the new edition, the revisions mainly deal with the new Committee of Transport Officials (COTO) Standard Specifications for Road and Bridge Works for South African Road Authorities, as well as updates on all standards and specifications applicable to suppliers of materials and services to national and provincial roads

agencies, as well as metros and municipalities.

The new COTO Standard Specifications for Road and Bridge Works for South African Road Authorities were approved as a Draft Standard in October 2020 and have now officially replaced the 1998 Standard Specifications for Road and Bridge Works for State Road Authorities by the Committee of Land and Transport Officials (COLTO).

SANRAL in March 2021 already made the new COTO Standard Specifications mandatory for use in its procurement documents.

Among the important points covered by Perrie and Rossman in the updated CCSA publication are "Maintenance and Repair of Concrete Layers" for which the structure is now completely different to the old COLTO specifications in terms of both materials are construction techniques. The revised handbook will also familiarise practitioners with the new specifications and highlight significant changes between the old and new specifications and explain the new COTA regulations on maintenance and repair.



Hanlie Turner, Business Development Manager of CCSA, says the revised manual will be welcomed by all practitioners involved in road pavement design, investigation, construction and testing. "Included among these are road authorities, consulting engineers, compilers of procurement documentation, contractors, tendering and pricing departments, and road laboratories. Commercial suppliers of concrete and con-

crete materials will also gain knowledge of the new material specifications," Turner adds.

For more information and details on acquiring the publication, go to the CCSA website <https://cemcon-sa.org.za/information-hub/books-for-sale/>. CCSA members can order directly from info@cemcon-sa.org.za, or visit the Information Centre, Block D, Waterfall Park, Bekker Road, Midrand.

Second Data Centre for Cape Town

AFRICA Data Centres, a business of Casava Technologies, a pan-African technology group, announced it is building a second data centre in Cape Town. The new facility will be in the north of the city and will have an IT load of 20MW. Construction is underway, and the facility will be up and running by mid-2024.

Africa Data Centres is investing further into the African market and is targeting Cape Town as a place to put deployments to offer a choice

of world-class facilities. This enables customers to put down multiple sites for redundancy or simply gives them an additional option in the market.

In terms of size, the data centre will be 12,000 square metres of white space or the space available for customers to lease, although the physical site will be much larger than that.

The second Cape Town facility is being built to Africa Data Centres' new standard modular design, pioneered by Africa Data

Centres ensuring rapid scalability and a standardised design that enables the data centre to be populated as and when required.

Cape Town is a prime location for data centres and within easy reach of all the submarine cable landing stations. In addition, the new data centre is positioned to provide geographic redundancy from the company's other facility, which lies in the south of the city, offering customers the option of deploying in two locations.

THE BEE IN MY BONNET COLUMN

Will the humble chicken, or lack of it, bring down the ANC?

RECENT news reports that 10-million chicks had to be euthanised due to loadshedding, has the usual suspects predicting that the latest effect of power losses spelling doom for our food security and the countries millions of citizens.

The boom in poultry production in this country does bring into sharp focus from where the majority of South Africans obtain their daily protein – particularly where dedicated fast food outlets are able to provide cooked chicken for the many

millions that do not have the necessary cooking or refrigeration facilities that the more affluent take for granted. A shortage of KFC or Chicken 'Licken and its attendant price increase may just be the straw that breaks the ANC's back!

One thing is for certain amongst the mess that is loadshedding is that the cost of just about everything will rise and add to the burden of poverty for those already in it and push those on the edge, over it.

We have all seen

the rise in food prices – especially chicken, blamed variously on worldwide inflation pressures, high fuel prices, shortages of fertilizer and stock feed caused by Russia's war in Ukraine, and now loadshedding. It will be interesting to see whether the profits of the major retailers show an increase at times of their financial disclosures and confirm what many believe that the supermarkets are price gouging – not letting a good opportunity to raise prices slip by.

If as they continu-

ously claim that their input costs are the main reason for the increases in food prices, then their profits should remain the same as pre the Ukrainian conflict. Any increase will confirm the foregoing gouging allocations despite their often trumpeted commitment to 'better value' and 'improved internal efficiencies'.

That farmers are having bumper years must be seen as a good thing for the economy as in addition to being able to satisfy hungry mouths at home,

a flourishing export trade adds valuable foreign exchange, so long as the impediments of loadshedding and deteriorating rail and harbour facilities put the brakes on further expansion.

Knock on effects

Most farmers are extremely entrepreneurial and this trait coupled which several years of favourable rains and climatic conditions have resulted in a booming sector. Increased yields have knock on effects – the

market for agricultural machinery has also shown an upward spike with more purchases of tractors and sophisticated field machinery which helps build momentum and jobs in the industry. Downstream the packers and producers have also seen increasing volumes but is there enough purchasing power in the local economy to take full advantage of this abundance?

Clearly poverty strangles increased consumption and the evils of loadshedding,

corruption and mismanagement of vital infrastructure ie Transnet – which like all bar one of the SEO's is not only morally bankrupt but financially too, which effectively strangles the whole country's growth potential.

So, rather than turning a new 2023 page we are saddled with the same issues that beset us in 2022 with no end in sight to this ANC made mess. Let's hope that a potential crisis in poultry farming is the catalyst that will see the demise of this corrupt regime in 2024.

SMS remains a force to be reckoned with, even 30 years after its launch

By Marthinus Jansen van Vuuren, Content Marketing Expert at Infobip



DESPITE the rise of advanced and hi-tech communication platforms in recent years, SMS usage for business communication is at an all-time high and the platform is expected to remain entrenched in this space for many years to come.

2022 marked the 30-year anniversary of the advent of SMS, which was initially launched as a person-to-person (P2P) communication platform in the early 1990s. At first, SMS messaging was limited to single mobile networks, but was opened to operate between different networks in the late 1990s. At this stage, businesses were already recognising the opportunities to use SMS as a communication medium, leading to it being increasingly commercialised.

However, a huge transformation for SMS occurred with the launch of the first Apple iPhone in 2007, which was when instant messaging through data networks became a leading trend. This gave rise to application-to-person (A2P) SMS messaging, with businesses relying on a system to disseminate

messages to customer groups or individuals.

Going from strength to strength

The A2P space is where SMS is hitting its sweet spot now, where it is gaining popularity and going from strength to strength. According to research by Mobilesquared, about 1.3 million additional businesses around the globe started using A2P SMS in 2020, while spend on A2P SMS is expected to grow 87% by 2025.

One of the main drivers behind the enduring popularity of the SMS platform and its growing uptake by businesses is that fact that it remains the most reliable communication platform to use when sending important and urgent messages to customers. This is especially pertinent at a time when identity verification is increasingly important, and one-time passwords or codes are typically sent to customers via SMS.

At the same time, personalisation is becoming increasingly important for customer engagements and while SMS messaging might appear very generic, the platform is expected to evolve drastically in the context of the Fourth Industrial Revolution in terms of hyper-personalisation. In this sense, SMS messaging is likely to become more effectively targeted at the individual and will become an integral part of businesses' omnichannel communication strategies. Given its affordability, SMS will likely become the first foot in the door for businesses looking to engage with customers. Should there be an uptake from

the customer following an initial SMS communication; it will most likely result in a communication flow into the other channels that form part of the business' communications strategy.

RCS unlikely to challenge SMS

While the introduction of Rich Communication Services (RCS) has been touted as SMS version 2 that will eventually replace the traditional SMS platform, this is unlikely to happen in the foreseeable future. This is because RCS relies on data connections to operate effectively. On a continent like Africa, data is not always available or affordable, so SMS still remains the best route to follow for businesses that wish to reach large numbers of customers.

Additionally, businesses have largely recognised that SMS has an opening rate of close to 98%, making it the ideal platform to ensure that message will reach customers. Because it is an instant message, an SMS is ideally suited to communicate special offers and product messaging to customers.

Due to its power and affordability, SMS is likely to remain an international messaging standard for many more years. One of its main advantages is that SMS messaging works on any GSM device and in places such as Africa, where smart phone penetration is still relatively low, SMS still has a major role to play. This is in spite of all the modern hi-tech communication technologies that are coming to the fore.

Ten tips to help your business survive spiralling electricity costs

ALL indicators point to 2023 being another year that South Africa will be required to operate in the face of a very challenging energy-constrained environment. Additionally, spiralling energy costs will drive an immediate cash flow crunch for businesses, and surging inflation is going to cause a spending slowdown. It's time to batten down the hatches...and have a plan. Whether this is saving electricity, using it more smartly, or generating their own, SA business has to have a plan now, before the crunch hits.

This is according to Roger Hislop, energy management systems executive at CBI Energy, who says, "South Africans are understandably shocked by the unprecedented tariff increases that NERSA has approved, with an 18.65% increase set to take place from April 2023, and another 12.74% confirmed for next year."

"While this is being couched as 'only' 18%, in reality it is a 34% increase in just over a year," he adds. "This is going to lead to inevitable price increases on everything, driving inflation way past the current 6-7% which is already crippling growth and job creation."

Hislop points out that, in addition to this, most municipalities with distribution licenses will also add a higher mark-up, meaning that come the beginning of April, South Africans may expect to see an increase of up to 22% or more on their utility bills, depending on who their local sup-

plier is. "These huge cost increases, together with continued low reliability of energy supply, are going to not only strengthen the case for installing solar and battery storage, but also clearly show that private generation is only half the solution: everyone needs automated energy management and load control systems to reduce wasted consumption and optimise power availability."

"The only solution in the short term is for both business and residential consumers to use electricity more efficiently, use less of it, and treat it like the scarce resource it has become," he recommends.

With many businesses facing a financially challenging 2023, Hislop outlines a further ten tips to help them take control of their energy costs:

Understand your bills: A large number of business owners are unclear on what they're paying for, such as 'time of use' tariffs and Notified Maximum Demand penalties. If you comprehend these, then some simple behaviour changes you make could take 20-30% off your business' electricity bill.

Check your bills: Install managed smart meters behind your utility meter to confirm you're being billed correctly. You'll also be able to see day by day what your consumption trend is to identify runaway usage before you get a month-end bill-shock.

Measure, measure, measure: Put managed smart meters on key distribution boards or large loads to under-

stand where your consumption is happening, and when.

Energy design: Build a simple plan around what parts of your business are energy-critical such as IT infrastructure, production machines, knowledge workers' computers, and communications systems. Consider which areas are your first, second and third priority electricity consumers; this allows you to plan around energy resiliency systems.

Schedule your loads: Just putting bigger loads on an automated schedule can easily save 10% of bills. Air conditioners, geysers and hydro boils don't need to be on at night. Most office lighting can be switched off too. Basic dumb timers can do the job, although a better option is centrally managed load controllers that let you quickly adapt to changing conditions.

Just when required: Don't leave anything running unless it's needed. Install load controllers on your meeting room air conditioners, for example. This, combined with a room occupancy sensor, means you only consume power when necessary.

Manage your physical environment: Look at your office design and make it more efficient. For example, use less electric lighting and more natural lighting options such as light pipes. You could also put in draught-doors to reduce your heating and cooling costs.

Implement Small-Scale Embedded Generation (SSEG): In South Africa, SSEG is generally either gener-



Roger Hislop.

ator sets or solar PV. Generators are a useful stopgap, but their energy is very expensive per kWh. The price of solar systems is falling, although pent-up demand is keeping costs high, so shop around and make sure that you're talking to an installer with strong credentials and a solid (referenceable) track record.

Apply load management to your SSEG: By managing your loads using even a basic Building Energy Management system, you can reduce the size of the inverter and batteries you need, while also ensuring that it is not tripped by overloading. You can optimise this when you use energy to "sweat the sun" – in other words, don't waste sunlight by starting the day with full batteries.

Consider the impact of energy security on your business: Electricity costs come directly off the bottom line, but reduced productivity, damage to equipment or machines and not being reliably open for business all have a more serious negative impact – this must be understood to successfully navigate our energy crisis.

Opinion Piece: Data management is a function best filled by experts

By Nick Wonfor, Head of Sales at DMP SA



DATA management has become a priority for Chief Information Officers (CIO's) due to the value that information delivers. However, it remains a niche component within the greater Information and Communications Technology (ICT) landscape and the skills pool is dwindling rather than increasing. Maintaining the data management function in-house has become a challenge, and organisations are increasingly looking toward Data Management as a Service (DMaaS) to help them manage this growing and complex environment. However, while Software as a Service (SaaS) solutions can be delivered from anywhere in the world, when it comes to managing data, local service and support remain essential.

Valuable, but complex

Data is acknowledged as a de facto business currency, it is immensely valuable in driving competitive edge and helping

businesses to make decisions with confidence and accuracy, as well as to reach goals faster. It is also increasingly regulated and governed by data privacy legislation, and if it is not managed properly, businesses face violating these regulations. Furthermore, organisations struggle with reduced operational efficiency, lost revenue, poor business decisions, damage to reputation, increased risk of cyberattacks and more.

However, managing data has become increasingly complex over the years. The introduction of the cloud has led to hybrid models where data is spread between various cloud providers as well as on-premises and in SaaS applications.

This has evolved organically, and as a result organisations also have a variety of data management and protection solutions that are used across this environment. This complexity stands in the way of innovation, and most IT decision-makers see storage and data management complexity as impeding digital transformation.

Don't do it yourself

Legacy infrastructure has led to many organisations attempting to manage their complicated data environments in-house, and the perception that managed services are expensive and unsuitable has com-

pounded this challenge. A common misconception is that data management is simply ensuring your data is stored and backed up. However, while a 'do-it-yourself' approach might seem attractive when budgets are tight, given the complexities of today's data landscape, it typically turns into a costly and complex exercise that involves many more facets than just storage and backup.

There is also a significant skills gap as today's IT infrastructure and software applications often require unique, specialised skill sets. This scarcity of IT skills means that IT heads, in small to medium enterprises (SMEs) especially, are finding it challenging to attract and retain the right talent to deliver on their strategic IT goals. Deploying and managing IT infrastructure is complex and this is where a Managed Services Partner (MSP) can play a significant role.

As a service, but locally

Many organisations have realised that creating an agile enterprise focused on delivering core business products and services is essential in their continued success and growth. Given the skills shortage across IT, one way to do this is to outsource some functions to experts, and data management is one area that can be highly beneficial to outsource.

DMaaS providers deliver the scarce and specialised skills needed and can assist in controlling costs, keeping sensitive data applications safe, delivering data recovery and disaster recovery, minimising downtime, assisting with cloud migrations and more. They can also address Recovery Time Objectives (RTO) and Recovery Point Objectives (RPO), deliver 24-hour support services from highly trained support teams and free up internal IT staff from time consuming tasks. With a managed data service, businesses are more likely to save on costs and experience better efficiencies, as they can leverage the complete array of data management services and solutions, delivered by an expert provider in a completely scalable manner for a predictable and cost-effective monthly expense.

However, given that data is critical to business and is also unique to the organisational environment, having a local DMaaS provider is key. This will ensure the highest levels of localised support from a partner that understands the South African environment and unique challenges, while businesses can leverage industry-leading data management technologies and global best practices, without the pain and hidden costs of managing it in-house.

R400bn lost to the economy – Transnet failures



Picture credit: James Arrwell.

Originally published in The Economist, 17th January 2023

"THE roads in the north of Kwa-Zulu Natal, SA's second-most-populated province, were once sedate. Lorries carrying timber or sugar cane from nearby plantations would trundle past, overtaken occasionally by tourists heading to game reserves. But these days hundreds of trucks laden with coal roar through small towns on their way to the port of Richards Bay. In September one lorry rammed into a pickup in the oncoming lane, killing 20 passengers, near the town of Pongola. "Our roads aren't meant for this amount of traffic,"

says Mike Patterson, from the local chamber of commerce. "The coal should be taken by rail."

Indeed it should. But SA's freight rail network is in such bad shape that firms are struggling to move their goods. In 2017 trains hauled 81m tons of coal to export terminals. This year about 54m tons will go that way; lorries will carry only another 9m. The decline reflects a missed opportunity: international coal prices soared last year after Russia invaded Ukraine.

The gap between what coal miners could dig and what they could export last year represents a loss of at least R80bn (\$4.7bn), estimates Jan Havenga of Stellenbosch Uni-

versity. Other miners and manufacturers report similar deficits. The total hit to South African firms from lost exports and the extra costs of going by road will amount to about R400bn in 2022 (6% of GDP), says Mr Havenga....

Over the past few years several other African countries, such as Mozambique, Tanzania and Zambia, have allowed "open access" to their rail networks. These countries sell slots on the tracks to private operators, which in turn bring fresh investment. Last year the SA government published a white paper promising to implement the idea. Yet progress on passing a bill has moved about as slowly as a coal truck through KZN."

WC Dept. recognised as best in SA for managing EIA's

THE Western Cape Department of Environmental Affairs and Development Planning (DEA&DP) has been recognised as the leading provincial department in administering and managing Environmental Impact Assessment (EIA) projects in South Africa by the Environmental Assessment Practitioners Association of South Africa (EAPASA). DEA&DP shares this recognition with the Gauteng Department of Agriculture and Rural Development.

In response, Anton Bredell, Western Cape Minister of Local Government, Environmental Affairs and Development Planning said: "EIA processes are critical as part of our efforts to serve present and future generations by securing ecologically sustainable development and use of natural resources while promoting justifiable

economic and social development."

Bredell said that considering the state of our social and economic challenges as well as the state of our environment, this is now more important than ever. "We must ensure both efficiency and effectiveness, to within as short a time and with as little cost as possible, achieve maximum positive outcomes and impacts."

"It also requires a team effort, and therefore the DEA&DP team is working with other authorities, environmental assessment practitioners and specialists, government and private sector developers, civil society, and communities. Thank you to the DEA&DP team for your continued service excellence and thank you to all the role players for your part in this award."

This award builds on recognition the depart-

ment received in 2022 for being the department with the most qualified and certified EIA practitioners in South Africa. At the time Bredell said: "From 8 August 2022, only a Registered Environmental Assessment Practitioner may investigate, assess, and prepare EIA reports and documents. Because we support an enabling business environment, DEA&DP has ensured that all officials working with EIA approvals are registered at EAPASA. Also, I am proud to say, DEA&DP currently has the highest number of EAPASA registered officials in South Africa."

The department was also recognised in 2022 by the National Department of Environment, Forestry and Fisheries for having the best Environmental Law Enforcement Compliance Team in South Africa.

Western Cape receives R290 million for flood damages

WESTERN Cape municipalities will receive R289 964 000 for flood damages suffered in the province during the summer and winter of 2021, Anton Bredell, Western Cape Minister of Local Government, Environmental Affairs and Development Planning said. Bredell was attending the provincial Minister and Mayoral Forum in Goudini today, to discuss a wide range of issues affecting service delivery in local governments.

"We are grateful for the allocation, and I want to thank my department for all the work and motivation that was needed to convince National Treasury of our need in this regard," Bredell said.



Bredell said the Provincial Disaster Management Centre will be responsible for coordinating the projects, and detailed business plans were developed for all construction or reparation projects to be funded through this allocation.

"The projects are also focused on disaster resilience and future

climate change challenges," Bredell said.

Overberg District Municipality will receive R15 493 000. This will, amongst others, go towards road works on the Hermitage Road and fixing of pipelines in Riversdale.

Cape Winelands District Municipality which will receive R10

310 000 will rehabilitate a bridge in Zwelithemba in Breede Valley and three pumpstations will be repaired. Garden Route District Municipality was allocated the lion's share of the budget and will receive R264 161 000. Projects include repairs to the 600mm main raw water pipeline from George to the water treatment works. In Oudtshoorn, projects will be focussed on storm water and road repairs, mostly in informal settlements in the area.

Minister Bredell said the Department of Local Government will provide technical support to the municipalities to ensure the money is allocated to the greatest effect.

Climate change conference & exhibition – a must see experience!

28th – 30th March 2023, Century City Conference Centre and Precinct.

1.5 DEGREES Africa's Net Zero Conference Exhibition and Experience is a premier event that brings together industry leaders, policymakers, and experts to discuss and showcase the latest developments in achieving net zero emissions in Africa. The conference features a wide range

of interactive sessions, panel discussions, and exhibitions that provide attendees with valuable insights and practical solutions for reducing their carbon footprint.

The event is particularly relevant for organizations and individuals working in the energy, transportation, and industrial sectors, as

well as those involved in sustainable development and climate action. Attendees will have the opportunity to hear from leading experts on the latest research and best practices for achieving net zero emissions, as well as network with like-minded individuals and organizations.

One of the highlights of the conference is the exhibition, which features cutting-edge technologies and solutions from leading companies and organizations in the field. Attendees can see first-hand the latest innovations in renewable energy, energy efficiency, and carbon

capture and storage.

In addition to the conference and exhibition, the event also features an interactive experience that allows attendees to learn about the challenges and opportunities of achieving net zero emissions in Africa. Through a series of interactive exhibits

and activities, attendees can gain a deeper understanding of the issues and learn about the practical steps they can take to reduce their own carbon footprint.

Overall, the 1.5 Degrees Africa's Net Zero Conference Exhibition and Experience is an impor-

tant event for anyone interested in achieving net zero emissions in Africa. It provides a valuable opportunity to learn from leading experts, network with like-minded individuals and organizations, and see first-hand the latest technologies and solutions for achieving net zero emissions.

Dry Ice now available in the Western Cape

DUE to its unique cooling properties, dry ice is becoming increasingly popular across various applications, whether for leisure or industrial uses.

Dry ice is a solid form of carbon dioxide, and since CO₂ does not have a liquid state at standard atmospheric pressure, it sublimates immediately from the solid state to the gaseous state, making it ideal for short-term refrigeration.

Dry ice also has proven benefits when used in the wine industry and is a reliable cooling mechanism during load-shedding. Dry Ice International has been offering this groundbreaking product to clients around South Africa since 1994, and is now available in the Western Cape.

Power disruptions, such as load-shedding, can result in a cooling crisis for private households and industries alike. Because of reasons beyond individual's control, refrigeration equipment may lose its ability to maintain a constant temperature during a cooling crisis.

Loadshedding can last up to six hours at a time, which is disastrous for cooling systems. The restaurant industry suffers tremendously when this happens during the warmest summer months and peak season demand.

Perishable goods can be stored for much more extended periods below freezing point with the help of dry ice. Dry ice blocks provide a much-needed answer to the continuing load-shedding situation in South Africa and the Western Cape by acting as a cooling layer on top of your perishable goods, preventing them from warming up even in the face of a power outage.

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28th - 30th March 2023

Cape Town South Africa

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Decarbonising the built environment through materials – an Aussie perspective



THE following abridged paper, co-written by Global GreenTag International's David Baggs (CEO & Program Director) and Dr Nana Bortsie-Ayree (Lead Product Assessor and Life Cycle Assessment (LCA) specialist) offers the South African building industry some thoughtful new approaches via LCA to bring more decarbonised products and materials into projects and deliver greater examples of climate friendly buildings.

Working closely with product certification programme developments, which are continuously unfolding at the Global GreenTag International headquarters in Australia, Lizette Swanevelder, CEO of Global GreenTag Africa claims:

"From a products and materials perspective, Global GreenTag certification is all over the decarbonisation issue. The long-term consequences of greenhouse gas emissions concerns humanity as a whole. We like to cover all areas of product assessment and the process of measuring carbon impacts through LCA processes and sharing this level of information

with the industry is critical."

David Baggs is a materials specialist and a Life Fellow of the Australian Institute of Architects and is well versed in the South African context. Dr Nana Bortsie-Ayree, who is from Ghana, has a background in Life Cycle Management with a doctorate in Management (Strategy and Natural Environment).

Although written from an Australian context, the steps towards decarbonisation apply equally well here.

The built environment contributes about 25 per cent of global greenhouse gas emissions. It is estimated that

to reach the 2050 goal of net-zero, the built environment industry will have to decarbonise three times faster over the next 30 years in comparison to the previous 30 years. Yet even this level of change will be insufficient to keep the global increase to 1.5°C.

In Australia, it is estimated that reducing embodied carbon in commercial and residential buildings by ten per cent between now and 2050 will lead to an elimination of at least 63 megatonnes of emissions. Recent changes to the Green Building Council of Australia's (GBCA) Green Star[®] green buildings rating tool have, for the first time in Australia, focused the industry's major players on embodied carbon emissions associated with materials. This article discusses decarbonisation from the aspect of up-front emissions of materials.

How likely is it that the industry will be able to achieve reducing up-front carbon emissions levels to net-zero?

This question assumes that material processing and building operations make up a significant chunk – about 95 per cent – of these emissions. For

the industry to make even a modest dent in emissions, substantial change and innovation will be needed in what is generally considered a highly risk-averse industry.

Decarbonisation from the material and embodied carbon perspective means taking on unprecedented innovation challenges, as well as changes to processes and supply-chain decision making. How to without unintentionally increasing other chemical pollutants or water contamination or consumption?

Life Cycle Assessment (LCA) is a tool that allows for the estimation of all impacts, including carbon emissions, for building materials beginning with the raw material extraction phase, through manufacturing, packaging, and transport, on to fate of the product at the end of its initial 'life.'

LCA studies generate data that quantifies impacts across a wide range of indicators, and when used as a carbon hot-spotting tool, support decision-making to incorporate innovative low carbon ingredients or processes. In totality, all these components contribute to what has been previously known as "embodied carbon" and, as indicated, is now described as 'up-front carbon' in the GBCA's Green Star 'Buildings' rating tool.

LCA generates volumes of complex 'inventory' data to develop the final set of indicators that include the total up-front carbon emissions data, much of which is highly confidential and will never be released, even to the client involved, because it often involves the direct provision of confidential information from third-party suppliers under non-disclosure agreements.

It scarcely needs restating that the consequences of not gaining rapid control of, and dramatically reducing humanity's carbon footprint, locally and globally, will be catastrophic.

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To read the original article visit: <https://www.globalgreentag.co.za/read/1130/decarbonising-built-environment-through-materials-an.html>

Health report recommends radical transformation

TWO years on from the outbreak of the COVID-19 pandemic, the world's healthcare systems may never 'return to normal' as a perfect storm of underlying challenges and future crises emerge.

KPMG's Healthcare Horizons report, warns that systems around the world – from government funded health services to privatized insurance-based models – are all facing potentially existential crises that require radical and innovative new thinking.

Long before COVID-19, workforce supply and wellbeing, and increased service demand due to aging and growing population and increased non-communicable disease burden were challenging healthcare systems. Looking towards the future, the report highlights that the pandemic

will likely prove to be just the first of several successive waves of crises that are expected to batter the industry such as a global recession, COVID response-related debt, geopolitical instability, and climate change disasters.

Healthcare Horizons predicts three possible future scenarios for the industry:

- **Impoverished:** In this scenario health systems revert to pre-pandemic 'business as usual'. They continue to rely primarily upon hospital-centric models of care, focus efforts on hiring new staff without addressing retention and wellbeing, and adopt some new technology in a disjointed fashion. The outcome of this scenario is that organizations are

likely to become overwhelmed by rising service demands and costs, which may result in varying degrees of system collapse or long-term declines in care quality and population health.

- **Alienated:** In this scenario health systems undergo radical technological transformation, leveraging data and emerging technologies. However, this is not accompanied by community engagement and integration, nor a focus on workforce. Although technology holds much promise in solutions for the future the likely outcome of this scenario may be two-tier systems in which those with the more digitally literate, urban, and

wealthy populations receive the highest quality service. A singular focus on technology also risks disaffection amongst clinical staff, especially if technology is implemented without staff taking a strong role.

- **Inclusive:** Through this scenario, technology and community assets are leveraged to increase workforce capacity to provide high quality care. Technology is seen as a means to an end – activating patients in their own care, enabling healthcare workers to better engage with patients, and empowering communities to address health inequity issues and employ more preventative approaches. The

outcome for this scenario is that healthcare organizations thrive, and entire populations benefit from improved health and care.

The Healthcare Horizons report calls for immediate action to address past and future challenges and urges decision makers to focus on an inclusive approach through which technology, workforce and community driven ways of working act like a triangle with each side strengthening the others.

A new approach that empowers communities and patients, treating them as active custodians of care, working in partnership with healthcare systems, has the potential to transform how healthcare is managed with far more collective responsibility and longer-term approach to wider wellbeing.

Dr. Anna van Poucke, Global Head of Healthcare at KPMG, says:

"COVID-19 wasn't a black swan event. The healthcare sector will never return to normal due to the underlying challenges that were already present before the pandemic. It may sound alarmist to talk about potential waves of future crises, but the stark reality is that health systems in almost every country and territory on the planet are already approaching their breaking points, with the coming crises likely to tip them over the edge."

"KPMG's report aims to offer a synergistic vision that focuses on the balance between investment in tech, workforce empowerment and genuine community involvement and decision-making. We're talking about

the true devolution of decisions and services – enabling healthcare users to take a more active role in guiding services in their area – backed by innovation and technology, rather than led by tech.

"The world's healthcare sector is on life support, but it isn't all doom and gloom. From the millions of people employed in the industry to the many people whose lives are positively transformed by access to good quality, proactive services, healthcare matters. Our report offers actionable insights. The moment has now come for health leaders to lift their attention from the day-to-day challenges facing their industry and to start strategizing beyond the typical one or four-year business planning cycles, towards the crises and future trends speeding towards them."

Energy Crisis Committee releases progress report

THROUGH the Presidency, the National Energy Crisis Committee (Necom) on Saturday, 21 January, released a six-month update on progress in the implementation of the Energy Action Plan. A series of interventions are planned, aimed at solving the country's worsening power crisis and easing ongoing load shedding. "The declining energy availability factor of Eskom's fleet reflects the cumulative impact of historical underinvestment in maintenance and assets, exacerbated by flaws in the design of new power stations in the last decade," Necom said.

Interventions documented in the report include:

Schedule 2 of the Electricity Regulation Act has been amended to remove the licensing requirement for generation projects, which will significantly accelerate private investment.

Since the licensing threshold was first raised to 100MW, the

pipeline of private sector projects has grown to more than 100 projects with over 9 000MW of capacity. The first of these large-scale projects is expected to connect to the grid by the end of this year.

Necom has instructed departments to cut red tape and streamline regulatory processes

for energy projects, including reducing the timeframe for environmental authorisations to 57 days from over 100 days. Reduce the registration process from four months to three weeks and ensure that grid connection approvals are provided within six months.

Project agreements for 19 projects from Bid Window 5 and six

projects from Bid Window 6 of the renewable energy programme, representing 2 800MW of new capacity. These projects will soon proceed to construction.

A new ministerial determination has been published for 14 771MW of new generation capacity from wind, solar and battery storage to accelerate further bid windows.

An additional 300MW has been imported through the Southern African Power Pool, and negotiations are underway to secure a potential 1 000MW from neighbouring countries starting this year.

Eskom has developed and launched a programme to purchase power from companies with available

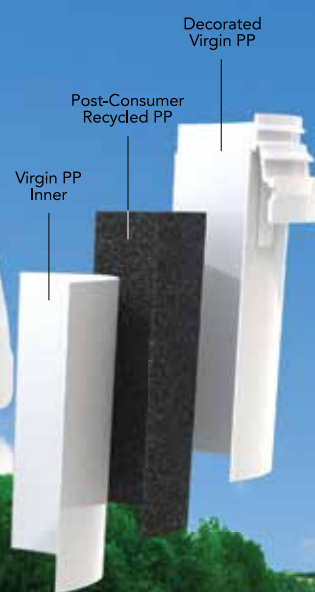
generation capacity through a standard offer. The first contracts are expected to be signed in the coming weeks.

A team of independent experts has been established to work closely with Eskom to diagnose the problems at poorly performing power stations and take action to improve plant performance.

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Welding Fume Extraction



THERE is no 'one size fits all' solution to the problem of protection from dangerous welding fumes, rather a combination of actions and products will reduce the risks to a minimum for welders and others.

Well-designed and located extract ventilation to remove fumes is an essential element. Given that a very small welding fume particle can take potentially 2 days to reach the floor when released from a height of 1.5 metres, it's clear these particles can remain suspended

in the workplace air well after the welder has stopped welding or changed tasks.

Fume particles can be inhaled by the welder during and after welding, and by anyone else entering in the workshop space.

Extracting the welding fume at the source is the goal. Think of it like a virus - you're trying to catch a cough or a sneeze to stop particles you can't see. If you can control the smoke right at the arc so capturing it at its source, you can remove almost all fume.

Capturing the fumes can be done using mobile fume extractors but the hoods are at a distance from the fume source, so the welder's head is often still in or close to the fume cloud and the hoods require frequent repositioning as the welding position is changed. This is particularly an issue when the welder works with long or large pieces, the repositioning frequently interrupts the job, plus the reach of the hood can limit the extraction area.

A more effective op-

tion is on-torch fume extraction. The extraction shroud is built into the welding torch, so moves along the weld staying very close to the fume source at all times with no disruption or extra effort from the welder.

Fume extraction torches are versatile; they are suited for any application where a regular MIG welding torch is used, TIG and mechanised torch options are also available. The only process that isn't supported by fume extraction is push-pull welding as manufacturers have found it too difficult to add a fume extraction system to an already over-sized torch.

A common concern of welders considering fume extraction torches is the size and weight of the torch, however, the cumbersome torches of the past have been upgraded to lighter and narrower models which focus on ergonomic designs to reduce weight and discomfort, while

also improving accessibility to welding joints.

Another issue with older style fume torches was increased porosity and resulting poor welding quality. This has been eliminated with improved physical design of the extraction shroud and ability to precisely adjust the extraction rate if needed.

So, fume extraction is a very important factor in reducing the risk

from welding fumes. A good look at the workshop situation and consideration of welding process, low fuming consumables, purified air powered respiratory helmets, etc, should be undertaken to decide the most effective way to minimise the risk of welding fume inhalation.

If you are considering extraction at source then you will require the

following equipment :

Fume Extraction Welding Torch High Vacuum Fume Unit.

For a good overview of fume extraction, view <https://www.binzel-abicor.com/US/eng/products/fume-extraction-welding/>

Reprinted from <https://weldingengineers.co.nz/news/welding-fume-extraction-the-latest>

Diagnosing porosity issues in vertical-up gas metal arc welding-pulse (GMAW-P)

By David Meyer and Rob Koltz, originally published in *The Welder*, 20 January 2023

OUR shop recently added gas metal arc welding-pulse (GMAW-P) capabilities using solid wire and a 92% argon/8% CO₂ gas blend. Historically, we have used CO₂ gas-shielded flux-cored products for all our carbon steel manual welding, but deposition efficiency improvements and fume level reduction prompted the change. The welders struggle with porosity issues when using GMAW-P in vertical-up welds. This happens typically in deeper groove welds where access to the root can sometimes be a challenge. Any ideas? To start, let's define what welding porosity is.

Porosity occurs when nitrogen, hydrogen, or oxygen become trapped in the solidifying weld metal as small gas bubbles. The sources of these three elements are atmospheric air, moisture, or the burning of hydrocarbons such as grease and oil. The welding arc is extremely hot, which causes these molecules to separate into their respective elements: hydrogen, nitrogen, carbon, and/or oxygen. These elements can reach levels beyond what filler metal deoxidizers can remove from the molten weld puddle and become trapped, resulting in porosity.

We are missing a little bit of information such as welding parameters, wire diameter and type, and any details about the base material. Occasionally, something minor in the details will jump out as the cause.

To minimize the potential for porosity, follow these basic good welding practices:

- Make sure the weld joint is free and clean of contaminants such as moisture, grease, paint, dirt, rust, and excessive mill scale.
- Ensure the welding zone is protected from excessive air currents such as open doors and fans.
- Ensure proper shielding gas and flow rates.
- Make sure there are no shielding gas leaks in welding gun or supply hoses/lines.
- Use proper welding techniques (i.e., avoid excessive electrical stick-out (ESO) or depositing extremely large weld beads).
- Minimize nozzle dip use.
- Use premium filler metals and do not use the red wool wire pads.

With the information you provided, let's examine what may be causing the porosity. Assuming the weld joint is clean and you follow good welding practices, then it may be something a little more subtle.

Gas-shielded flux-cored wires are resilient when dealing with less-than-perfect weld conditions. The weld protection they provide with the slag layer and external shielding gas make them very robust for many applications. Because of these features, your welders most likely experience few issues with them.

Comparatively, solid wires do not offer the same benefits. They lack the slag layer, which can provide additional weld metal protection when you lose shielding gas or the additional deoxidizers. Additionally, CO₂ shielding gas provides great cleaning action on contaminants such as rust and mill scale. The

solid-wire shielding gas you're using contains mostly argon—which is nonreactive—and a small amount of CO₂ compared to the flux-cored wire, which reduces the cleaning action.

You stated the main porosity areas are hard-to-reach, vertical-up groove weld joints. This brings proper shielding gas coverage into consideration. If the joints are difficult to reach, it is possible your ESO is excessive, which can lead to a lack of shielding gas protection. If you are using standard 15mm weld gun nozzles, this will force the welder to use an excessive ESO to see and access the joint.

However, if you are using 9,5mm tapered gas nozzles, you will want to verify shielding gas flow rate at the nozzle.

The general recommendation for non-helium shielding gas flow rates is 0,7 to 1 m³/h for small-diameter wires and 1 to 1,35 m³/h for large-diameter wires with standard nozzles. If you are using the 9,5mm tapered nozzles, you will want to set the flow rate no higher than 0,85 m³/h. The reason is for a set volume of gas to exit the nozzle, it will have an associated velocity. As you increase flow rate, the velocity increases as well. When you increase flow rates above 1,35 m³/h in standard nozzles, the exiting gas velocity creates a vacuum near the end of the nozzle opening, which may aspirate atmospheric air into the shielding gas plume. The exiting shielding gas velocity in tapered nozzles may become excessive at much lower flow rates, which can produce the same issues. Not only can this produce porosity, it is simply a waste of shielding gas.

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Bespoke fire-risk systems for agri and food processing

FIRE engineering specialist ASP Fire has specialised expertise in the agri and food processing industries. "In creating a bespoke system for any new or operational businesses, we look at each risk area and ask what it is we need to do to mitigate this particular risk," explains ASP Fire CEO Michael van Niekerk.

The company's risk mitigation systems comply with the NFPA 36 standard for several solvent extraction plants in terms of fire prevention and suppression. Compliance is vital to save lives, reduce the costs of fire damage, and protect equipment and buildings from major damage.

solvent that extracts the oil from the meal is then removed from the oil by a drying process.

The two major risk areas here are the preparation and solvent plant buildings, each around six storeys high, which makes escape for any occupants in the event of a fire a massive challenge. When the product starts to burn, it does so rapidly, which calls for fast-acting fire suppression.

The last part of the process is storing the dried meal, where there is a lot of airborne dust. This creates an explosive atmosphere that can be ignited by a single spark, posing a potentially far greater fire risk than the hexane

a tanker fire. This is evident in the recent gas tanker explosion in Gauteng where 41 people died.

Mitigating the overall fire risk associated with tankers and refinery structures calls for a high-velocity deluge system over the solvent tankers at the refuelling point. As the solvent is highly flammable, any fire must be put out to avoid a BLEVE event.

Another project at a leading Mpumalanga macadamia nut processing company called for compartmentalisation, safety distances, access routes and installation of a fire-detection system. Macadamia nuts have a high fat content of 70%, which is

ing the opportunity to design the system from scratch allowed ASP Fire to take all factors into consideration without having to remove existing systems.

Interlocking, the automatic shut-off of certain processes, is used to control the spread of any potential fire. The bulk conveyors that move from one section to the next generally pass through the firewalls, which means the firewalls themselves must be sealed off in the event of a fire to stop any combustible product moving from one enclosure to another.

"We design the most comprehensive set of solutions, using the most advanced meth-



The company's track record includes completing rational designs for solvent extraction plant clients operating sunflower and soya seed processing facilities in the Limpopo Province, North West Province, Gauteng and Mpumalanga. An initial oil rich mash or cake is formed and then the oil is extracted using a hexane solvent process. This highly flammable

plant itself. There is also crude oil storage that is not flammable but combustible.

One of the biggest risks in industries that use solvents such as hexane is the so-called BLEVE phenomenon, an acronym for Boiling Expanding Liquid Vapour Explosion. A hexane tanker could be up to 42 m³ in size, so an incident such as brake failure can quickly become

a major fire risk in any processing facility.

Macadamia nuts are supplied in bulk by farmers and go through an initial drying process. Thereafter, the nuts are shelled and sorted before a second drying process and reaching the packaging area.

The processing facility is large, meaning product must be moved from section to section by conveyor belts. Hav-

ods and equipment available. Insurers and local authorities certify that we have addressed all necessary regulations and that all our work complies with the strict standards governing that specific industry. Then it is about constant vigilance and inspections, caution on the part of by all personnel and knowing how to avoid the unimaginable," concludes van Niekerk.

Printable food safe blue material



iglidur i6-BLUE material has been developed as a 3D printable material for use in food and beverage processing

POLYMER manufacturer, igus, is launching a new food safe SLS printing material for 3D printers to assist manufacturers of machines and systems to develop parts more quickly and reduce reliance on classic manufacturing technologies like turning and milling.

As a result more designers want to make use of the blue printing material. The food-safe laser sintering material iglidur i6 is approved by the FDA and EU 10/2011 and is now available in blue and thus also ensures the required optical detectability in applications in the food and beverage industry.

Thanks to the highly visible colour blue, the powdery iglidur i6-BLUE is easy to detect which in turn increases machine hygiene. If a 3D-printed component breaks, blue fragments in the product can be recognized by detectors and the eye. The only problem with the blue printing materials, that are both robust and food-safe, are still scarce on the market for the selective laser sintering (SLS) manufacturing process.

Machine hygiene

The new material is

also FDA and EU 10/2011-compliant, thus increasing the safety of machines and systems in the food and beverage industry. The iglidur i6-BLUE is in no way inferior to the proven iglidur i6 in terms of strength and good gliding properties and is particularly suitable for the 3D printing of worm wheels, gear wheels and snap connections.

"In order to meet the high demand, we have now developed iglidur i6-BLUE, a blue-colored printing powder which is compatible with all common SLS printers" says Ian Hewat managing director for igus. The material is resistant to temperatures between -40°C and +80°C. "Tests conducted inside our laboratory have also shown 3D-printed gears made of iglidur i6-BLUE have a much longer service life than wheels made of polyoxymethylene (POM) and are at least 9 times more abrasion-resistant than PA12 (SLS)", says Ian.

Due to the high elongation at break, the SLS printing material is also suitable for the additive manufacturing of snap connections. Microscopically small solid lubricants are integrated into the SLS printing material, which are automati-

cally released during movement and enable low-friction dry running. Lubricants, which attract dust and dirt and, in the worst case, become a risk of contamination, are therefore superfluous.

Printing service

Machine builders who do not have their own 3D printer can use the 3D printing service from igus -without a minimum order quantity. All that is required is to submit a 3D model of a component. The SLS printer then produces it in layers from the new iglidur i6-BLUE printing material - much faster than is possible with classic production technologies such as turning or milling.

"For special components, prototypes and series of up to 10 000 pieces, we can reduce the delivery time from several weeks to five days, which is an offer that more and more customers are gratefully accepting in view of supply chains that are faltering worldwide."

igus South Africa, Ian Hewat, managing director, Tel: (011) 312 1848, Fax: (011) 312 1594, Email: ihewat@igus.net, Web: www.igus.co.za

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New high-speed motor offers improved power density for use in electric vehicles

By Neil
Martin, University of
New South Wales

UNSW engineers have built a new high-speed motor which has the potential to increase the range of electric vehicles. The design of the

prototype IPMSM type motor was inspired by the shape of the longest railroad bridge in South Korea and has achieved speeds of 100,000 revolutions per minute. The maximum power and speed achieved by this novel

motor have successfully exceeded and doubled the existing high-speed record of laminated IPMSMs (Interior Permanent Magnet Synchronous Motor), making it the world's fastest IPMSM ever built with commercialized lamination materials.

Most importantly, the motor is able to produce a very high power density, which is beneficial for EVs in reducing overall weight and therefore increased range for any given charge. The new technology, developed by a team headed by Associate

Professor Rukmi Dutta and Dr. Guoyu Chu from the UNSW School of Electrical Engineering and Telecommunications, is an improvement on existing IPMSMs, which are predominantly used in traction drive of electric vehicles. An IPMSM type

motor has magnets embedded within its rotors to create strong torque for an extended speed range. However, existing IPMSMs suffer from low mechanical strength due to thin iron bridges in their rotors, which limits their maximum speed.

But the UNSW team have patented a new rotor topology which significantly improves robustness, while also reducing the amount of rare earth materials per unit power production.

Bridging the future

“With this research project we have tried to achieve the absolute maximum speed, and we have recorded over 100,000 revolutions per minute and the peak power density is around 7kW per kilogram” says Dr. Chu.

“For an electric vehicle motor we would actually reduce the speed somewhat, but that also increases its power. We can scale and optimize to provide power and speed in a given range—for example, a 200kW motor with a maximum speed of around 18,000 r/min that perfectly suits EV applications.

Apart from electric vehicle, the motor has many other potential applications. One of them is large heating, ventilation, and air conditioning (HVAC) systems which require high-speed compressors to use a new form of refrigerant which significantly reduces the impact on global warming.

It can also be utilized in high-precision CNC machines that are highly demanded by the aviation and robot industries. The UNSW high-speed motor technology can allow such high-precision CNC machines to mill or drill with minimal diameters.

Another application is as an IDG (Integrated Drive Generator) inside an aircraft engine to provide electrical power for aircraft systems.

The UNSW team's new motor also offers a significant cost advantage over existing technology and uses less rare earth materials such as neodymium.

“Most high-speed motors use a sleeve to strengthen the rotors and that sleeve is usually made of high-cost material such as titanium or carbon fibre. The sleeve itself is very expensive and also needs to be precisely fitted and that increases the manufacturing cost of the motor,” Dr. Chu says.

“Our rotors don't need that sleeve, which reduces the manufacturing cost. And we only use around 30% of rare earth materials, which includes a big reduction in the material cost—thus making our high-performance motors more environmentally friendly and affordable.”



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Evidence favours sun, wind power and storage over fossil gas

By Jo-Anne Smetherham and David Le Page of Fossil Free SA

IN the November 2022 edition of Cape Business News, Nick de Blocq, CEO of fossil gas exploration company Kinetiko Energy, called renewable energy development in South Africa a “pipedream”. He made a host of assertions about the unsustainability of renewables, with no references to scientific or independent sources, and making no mention of how his industry is destabilising our global climate.

The reason Kinetiko, an Australian company, is seeking to bring its outdated technology to South Africa is probably that Australians themselves have already learned that the alternative of renewable energy plus storage is far superior to and cheaper than gas, even without regard to environmental costs (which are all too real).

The deployment of a grid-scale Tesla battery at the Hornsdale Power Reserve in South Australia in 2017 lowered prices in South Australia’s frequency and ancillary services electricity market by 90 per cent, benefits that have been passed on to consumers, while being able to far more precisely match supply to demand than can gas peakers. The Hornsdale battery saved South Australian consumers AUD 116 million (\$75.78 million) in 2019 alone, and greatly reduced the scope for fossil gas plants of the kind de Blocq seeks to foist on South Africans to charge extortionate rates during times of peak demand.

In the US, similar utility scale battery storage facilities are being built at a pace that exceeds even the growth rate of the solar energy boom, with the US Energy Information Administration projecting 20.8 GW of battery storage capacity to be added from 2023 to 2025.

These developments show how renewable energy is in most instances cheaper and more practical than dirty fuel sources such as coal, oil and gas; and is the quickest way of addressing South Africa’s electricity crisis.

This view is not the wishful thinking of radical activists but the view of many independent energy analysts, who have called for the accelerated and large-scale provision of wind and photovoltaic power in South Africa.

Among these analysts is UCT researcher

Hilton Trollip, who told the Mail and Guardian in July 2022 that models have proven that large-scale renewable power is the core of the solution for South Africa, and the country is “quite capable of implementing it.”

De Blocq also asserts that it would be impossible for South Africa to install the massive number of wind turbines and solar panels needed to plug our energy gap, roughly 20 GW over the next five years.

Again, real world precedents suggest he is wrong. Vietnam, a country with half South Africa’s GDP per capita, installed 9GW of solar panels in 2020 alone (SA’s entire grid is around 40GW). If our energy minister was serving the interests of all South Africans, and not just those of the coal and gas lobbies, we would have already resolved our energy crisis.

Contrary to the impression too often created by the SA media, there is in fact a substantial real expert consensus that all the world’s energy needs – electricity, transport, heating and industrial processes – can ultimately be met using renewable energy technology. The technology for large-scale storage of power generated by the wind and sun has advanced fast in recent years, and can now provide grid-scale capacity needed for renewables to replace fossil-fuels.

The South African government’s Just Transition aims to achieve net-zero carbon emissions by 2050, to a large degree through large-scale new renewable power projects, to protect livelihoods in communities that currently depend on coal.

As part of this transition, South Africa’s cabinet has approved an investment plan for an \$8.5bn package to accelerate the country’s transition away from coal and towards clean energy.

How fossil gas accelerates climate change

Methane, the primary component of fossil gas, is of particular concern as a greenhouse gas because it is at least 80 times as potent a warming gas as carbon dioxide in the first 20 years after its emission.

Methane is emitted to the atmosphere during the production, processing, storage, transmission and distribution of fossil gas, and the production and processing of crude oil. It is also emitted during human activities including livestock farming, and by landfills.

A recent study found that cutting short-lived pollutants such as methane could reduce global heating by one half between 2030 and 2050. This is not the time to be pumping more of it out of the ground. Yes, fossil gas produces less carbon dioxide when burnt than does coal, a point the gas lobby loves to emphasise. They’re less quick to mention that methane leaks across the gas production and transport value chain typically more than cancel out that advantage.

United Nations Secretary General Antonio Guterres has said in a speech to the UN General Assembly that all oil and gas exploration should be stopped to help keep global heating under 1.5C.

It is crucial to provide the climate context to discussion such as these. The Paris Agreement on Climate Change commits countries to holding global warming well below 2C, and ideally 1.5C at most, to avoid the most catastrophic effects of climate change.

This requires a 50% reduction in global carbon emissions by 2030, and the world will have to eliminate most greenhouse gas emissions by 2050 – although the latest report by the UN Intergovernmental Panel on Climate Change says this date needs to be brought forward, as the world is heating faster than previously thought.

We risk very soon passing climate “tipping points”, after which natural processes will irreversibly accelerate the human warming influence. Far too few people are even aware of this extraordinary danger.

Nuclear energy?

De Blocq asserts that every country that can develop nuclear power, should do so. We disagree. In October last year, 26 of France’s 56 nuclear reactors were offline, struggling with maintenance problems and droughts worsened by climate change (nuclear plants need reliable water supplies for cooling). Shades of Eskom load-shedding... with brutally expensive high-level waste management legacies to boot.

Nuclear power is now far more expensive than renewables and can’t be built at the speed needed to address the climate emergency.

There may be a residual role for nuclear in some contexts (e.g., inside polar circles), but it’s not needed here. Even our coal-obsessed Department of Energy concedes SA has a solar resource that is “one of

the highest in the world”. Long-term energy storage technologies are likely to be far cheaper and more robust solutions for our needs than nuclear energy.

A community-friendly alternative to gas peakers

In California, the Clean Coalition has proposed community microgrids (combining district household solar and storage) as alternatives to gas peaking plants. Their modelling shows that: “Without even accounting for operations, maintenance, and fuel — which would increase gas plant project costs dramatically — a community microgrid powered by solar+storage could replace [two planned gas peakers] for approximately \$406 million.” In this instance, this solution would be 30% cheaper than a gas peaker to build, cost far less to run, and provide community and grid energy security simultaneously.

It goes without saying that in a country like South Africa, rolling out solar community microgrids in historically disadvantaged communities while also building national grid security would be an amazing win-win scenario.

Sustainability of renewables

De Blocq also states that renewables aren’t sustainable. In some ways, he is right; no technology comes without impacts and unforeseen consequences. Currently, components of renewable power projects are often not recyclable, which does need to be considered when these projects are decommissioned.

So more attention must indeed be paid to making wind turbines and solar panels recyclable. Wind turbine manufacturer Vestas already produces 85% recyclable turbines, and aims for 100% recyclability by 2040. Multiple projects are under way to recycle even awkward components such as wind turbine blades, and responsible actors in the solar industry are looking at recyclability. But these very real current waste management problems do not outweigh the urgency of acting on climate immediately.

Conclusion

We need to act now to ensure our electricity supply and reduce carbon emissions, using the best technology at our disposal, rather than letting the perfect be the enemy of the good.

Right of reply.

The era of basing electrical grids on massive centralised so-called baseload power is past. In modern grid management, “baseload” is now understood to be a function of how a grid functions as a whole; it has become far more expensive to rely on a few large facilities for baseload.

Over time, we will need to look at all renewables projects, along with all other sectors, from a circular economy perspective, putting plans in place for all elements when plants are decommissioned.

To the extent that it still operates, Eskom now functions in good part as a subsidy to South Africa’s coal mafia, as the horrifying attempted poisoning of outgoing CEO Andre de Ruyter clearly showed. How did De Ruyter threaten that coal mafia? He’d realised Eskom needs to go green.

The last thing battered South African consumers now need is to be further forced into subsidising outdated and expensive fossil fuel technologies, allowing a new fossil gas industry to develop and hold us hostage to ever-rising energy costs for another generation; and to an industry that is, on the whole, one of the world’s most corrupt.

It’s undoubtedly challenging moving away from fossil fuels, but it can be done, by moving to renewables along with a circular economy and

a new culture of more thoughtful consumption. No other course of action makes sense. The alternatives are cheaper, more flexible, more robust and far less damaging to our global home.

– Le Page and Smetherham work for Fossil Free SA, a campaign advocating for divestment by institutions and individuals from fossil energy, to protect the human rights – and long-term savings – of current and future generations. We are currently funded by grants from European foundations and small donations from local supporters (more of which are always welcome). www.fossilfreesa.org.za.

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Car maker to explore geothermal energy potential



Stellantis' Rüsselsheim industrial site in Germany.

EUROPEAN car maker Stellantis N.V. and Vulcan Energy Resources Limited have signed a binding term sheet for the first phase of a multiphase project to develop new geothermal projects aimed at decarbonizing the energy mix of Stellantis' Rüsselsheim industrial site in Germany, which is home to both the DS4 and Opel Astra. Based upon current assumptions, the project could provide a significant portion of the industrial site's annual energy needs starting in 2025.

The first phase of the project, located at the northernmost extent of Vulcan's focus area in the Upper Rhine Valley, will include a pre-feasibility study for the construction of geothermal assets for Stellantis' facility, carried out by Vulcan. If successful, the next phase will focus on drilling and more advanced studies and development. Stellantis will aim to source funding for 50% of the project development, which is also supported by the local government.

Stellantis and Vulcan will aim to produce clean electricity and supply it to the grid for both internal and external consumption, in accordance with Germany's Renewable Energy Act (EEG), while also producing heat to be transferred to Stellantis' manufacturing site.

"This partnership with Vulcan reinforces our commitment

to promoting greater clean energy solutions across our enterprise," said Stellantis CEO Carlos Tavares. "It is one of many actions we've taken to drive results, impact, and sustainability in alignment with our Dare Forward 2030 strategic plan."

Stellantis is committed to become the industry champion in climate change mitigation, becoming carbon net zero by 2038, with a 50% reduction by 2030. The agreement with Vulcan Energy marks Stellantis' first potential use of renewable geothermal energy to decarbonize and localize its energy supply at an industrial site.

"Vulcan's core mission is decarbonisation, through renewable energy and carbon neutral, zero fossil fuels lithium supply," said Vulcan Managing Director and CEO, Dr. Francis Wedin. "Vulcan is here to support Stellantis, our largest lithium customer and one of our major shareholders, to decarbonize its operations in Europe. While we remain focused on our geothermal-lithium developments in the center of the Upper Rhine Valley Brine Field, this project is a complementary opportunity to expand our development pipeline to some of the outer lying areas in the Upper Rhine Valley, supported by industrial partners like Stellantis."

About Stellantis
Stellantis N.V. (NYSE / MTA / Euronext

Paris: STLA) is one of the world's leading automakers and a mobility provider. Its storied and iconic brands embody the passion of their visionary founders and today's customers in their innovative products and services, including Abarth, Alfa Romeo, Chrysler, Citroën, Dodge, DS Automobiles, Fiat, Jeep®, Lancia, Maserati, Opel, Peugeot, Ram, Vauxhall, Free2move and Leasys.

About Vulcan

Vulcan is aiming to become the world's first lithium producer with net zero greenhouse gas emissions. Its Zero Carbon Lithium™ Project intends to produce a battery-quality lithium hydroxide chemical product from its combined geothermal energy and lithium resource, which is Europe's largest lithium resource, in Germany. Vulcan's unique, Zero Carbon Lithium™ Project aims to produce both renewable geothermal energy, and lithium hydroxide, from the same deep brine source.

In doing so, Vulcan intends to address lithium's EU market requirements by reducing the high carbon and water footprint of production, and total reliance on imports. Vulcan aims to supply the lithium-ion battery and electric vehicle market in Europe, which is the fastest growing in the world.

Going solar? Buyer beware!

By Robin Hayes

THE more than 14 years of loadshedding imposed by Eskom coupled with advances in photoelectric technology has spawned a new industry, which makes going 'off the grid', or being able to mitigate outages, a reality.

As with any new technology that has been widely commercialized it attracts its fair share of opportunists as well as those with the background, skills and experience in similar industries – in this case, mainly electrical contractors.

With no end in sight to Eskom's and the country's energy malaise, those citizens able to afford it and for those businesses where power is a necessity, PV Solar power seems like the solution, but it is not the panacea and has plenty of pitfalls for the unwary.

These are the sentiments of Svilen Voychev, CEO of Valsa, a turnkey supplier, with a focus on systems integration and the manufacture of all things solar.

Voychev explained to editor Robin Hayes that the factors that attracts so many into the solar field, also attracted him when he began as a solar installer back in 2009, prompted by Eskom's first bout of loadshedding and the rapid development of an exciting technology.

As an early participant Voychev admits to learning on the job but the 13 years he and his company have been in the solar business has provided invaluable experience to others in what he describes as an immature industry.

A little knowledge is a dangerous thing

"Just because a person is a certified electrician doesn't make him a qualified solar technician" says Voychev,

"the electrical component is just one aspect of installing solar which is a multi-disciplinary activity requiring additional skills in design, procurement, structural engineering, lightning protection, earthing and project management. There is great temptation for the opportunists to regard solar as an extension of house building where the contractor can source products from different suppliers, usually depending upon price. Unlike house building, every solar installation is different, from the customer's expectations to the orientation of the building, its method of construction and the specialised roof mounting solutions – all these factors have to be taken into consideration for a successful installation" he explained.

An emotional decision

"The vast majority of the solar market – probably 80% - is in the residential sector where the purchase of solar is viewed as an emotional decision. Few home owners have the knowledge of what goes into a solar installation and even have difficulty in assessing the load imposed by the appliances they use on a daily basis!"

"Cost is a major factor in this market and there are plenty of installers willing to cut costs and install inferior equipment in order to make a quick buck – either deliberately or through ignorance."

Commitment

Voychev's 13 years in solar shows a commitment to the technology – so much so that he realised early on that unless there was some formal training and exposure to would be installers, then the whole industry would rapidly get a bad name and worse



Svilen Voychev.

still the country could be flooded with cheap, inferior imports.

To this end, Valsa now offers training courses where his experience in engineering, design and PV solar products procurement is shared.

Training

Product knowledge training is offered in both Johannesburg and Cape Town operations to ensure customers are familiar with the Valsa Mounting Solutions and the range of PV solar products. Valsa is looking at offering practical training in the future in partnership with a strategic partner.

Installation & maintenance manuals

Standard installation and maintenance manuals as well as engineering drawings and specifications for customised solutions are available to assist installers with ground mount, canopy, and rooftop installations as well as any custom-made solution related to the PV solar plant.

Commercial installations

"The installation of solar in commercial buildings represents about 20% of the total market and fares better in terms of pro-

fessionalism than the residential sector" he explained.

"Usually the client relies on the expertise of architects and professional engineers, who process some or all of the expertise necessary, but even amongst professional consultants, photovoltaic knowledge is scant and qualified installers of large scale installations are few and far between.

"We are in position to help fill this knowledge gap and for that reason have developed partnerships with the ECA (Electrical Contractors Association), SAPVIA, (The South African Photovoltaic Industry Association), PV Green Card and other professional bodies.

"My advice for would be purchasers of solar is to do your homework first, check the credentials of a preferred installer – how long have they been in business, can they supply contactable references etc. Are they forthcoming with advice and prepared for an essential site visit. Avoid 'boxed, on line' solutions and the seemingly cheapest solution! We also can assist in the decision with access to our database of reliable installers with whom we have a track record, so its buyer beware!" he concluded.



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Renergen hits helium jackpot



Image: Virginia Gas Plant (helium block)

RENERGEN, the Free State's natural gas and helium producer, has announced that with the production of first liquid helium at its Virginia Gas Proj-

"Having the helium plant in operation and producing liquid helium is a truly spectacular achievement..."

ect, it has now become the world's newest producer of liquid helium. The helium module is now operational and

being optimised.

"Having the helium plant in operation and producing liquid helium is a truly spectacular achievement by the team who went above and beyond to achieve the major and critical milestone. All components of the Phase 1 plant are now in operation, and South Africa joins the ranks of only eight countries in the world to produce this rare and valuable liquid," said Stefano Marani, CEO of Renergen.

Zest WEG gains traction in oil and gas

AFRICA is hungry for electricity, and electrical specialist Zest WEG is seeing growing demand from the oil and gas sector, both in upstream and midstream facilities as nations on the continent look to these commodities to power their economies.

According to Lukas Barnard, Zest WEG's business development specialist for the oil and gas sector in sub-Saharan Africa, the trend is towards gas production due to its lower emission levels of greenhouse gases. At the same time, the oil sector remains a vital part of many African economies with WEG product and solutions being applied in both upstream and midstream facilities in countries such as South Africa, Botswana, Namibia, Mozambique, Congo, Gabon, Uganda, Ghana and Nigeria.

Barnard highlights that Zest WEG – as the fully owned subsidiary of the global WEG group responsible for sub-Saharan Africa – developed a strategic focus on the oil and gas sectors in recent years. This has seen the

company engaging with the sector in various southern, central and west African countries.

"Among the exciting projects we are involved in is an oil and gas refinery in Nigeria, where we have supplied two WEG medium voltage soft starters; an 8.4 MW 11 kV unit and a 2.1 MW 6.6 kV unit," says Barnard. He notes that compressors are critical in the refinery process and explains that WEG soft starters will significantly reduce stress on the compressor at start-up which will improve the equipment's mechanical life and equipment uptime for higher plant productivity. The soft starters will also reduce the start-up current. Following consultation with the customer to clarify certain technical elements of the scope of supply, both soft starters were custom designed and manufactured for this application.

In another project, Zest WEG has supplied eight large WEG motors in a phased contract to a floating production storage and offloading (FPSO) moveable platform off the coast



One of eight large WEG motors supplied to a FPSO off the coast of Ghana.

of Ghana. These units are upgrades to previously installed WEG motors which had been operating successfully on this site for over a decade. Zest WEG are also involved in testing and installation of the motors. "In southern Africa, Zest WEG has recently supplied transformers, switchgear and containerised modular substations to an onshore natural gas and helium project in South Africa," he says. "This is the country's first and only helium producer with reportedly world-beating concentra-

tions of helium."

He highlights that there are exciting oil and hydrogen prospects in Namibia, while massive gas discoveries have been made in Mozambique – where WEG is already involved. Another prospect that bodes well for the sector is a significant crude oil resource at Lake Albert in Uganda.

"It is important to stress that Zest WEG has considerable design and manufacturing capacity in South Africa which allows us to locally produce a range of equipment for both upstream

and midstream operations in the oil and gas sector," Barnard says. "This includes transformers, substations, low voltage switchboards and generator sets."

The company's Africa footprint is supported by its value-added resellers in various countries, who are locally based firms operating close to customers offering the highest levels of local support in each region which includes both service and technical capability.

For more information visit: www.zestweg.com

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ger than the previous industry-leading materials. Carlisle's EPD824 material provides system design teams with the option to increase power output without adjusting system size, and the ability to reduce system component sizing without sacrificing system power output. Additionally, EPD824 can be used equally in transmissions and brakes, thanks to its versatility and superior heat and power resistance.

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For further information visit: www.danfoss.com

SEW-EURODRIVE's African expansion

DESPITE the travails of the global economy and uncertainty in many countries, Africa will be the place to do business in the coming years.

So says Raymond Obermeyer, managing director of SEW-EURODRIVE South Africa, whose company has worked successfully around southern, central and east Africa for decades. The company's expansion efforts are now ramping up, as SEW-EURODRIVE has embarked on a progressive branch establishment strategy.

"Customers around Africa know our brand well, and respect the precision German engineering that underlies all our products," says Obermeyer. "They also rely on our strong service ethic, which is based on our culture of responsiveness and understanding customer needs."

A key aspect of the company's high levels of customer support derives from its infrastructure and capability — as well as having a presence close to customers' sites. Ready availability of stock, and quick turnaround times for designed solutions, are ensured by SEW-EURODRIVE's newly built and expanded facility in Aeroton, Johannes-

burg.

"These new headquarters — worth around R500 million in infrastructure and stock — was a carefully considered investment in our future growth," he explains. "It has also enabled a three-fold increase in our stockholding, which is vital to ensuring that customers get what they need, when they need it."

In addition to serving branches in Nelspruit, Durban, Cape Town and Gqeberha, this state-of-the-art facility supports over 23 more countries in Africa. It is this proven branch model that the company is now rolling out. Moving gradually away from the distributor model of product sales and support, he explains that four countries are strategically targeted each year for a branch establishment.

"Taking a phased approach to our growth strategy, we began establishing branches in our key growth areas of Zambia, the Democratic Republic of Congo (DRC), Kenya and Tanzania in 2022," he says. "In the years to come, we aim to target around four countries a year in which to put a branch in place."

The model, emphasises Obermeyer, has



benefits not only to customers but also to the host countries. While the investment is greater, there is more control over factors like service quality and performance. By appointing and training its own staff, SEW-EURODRIVE is ensuring that customers get a uniformly high standard of support, irrespective of their location.

"This strategy also aligns with the growing trend in Africa towards localisation," he points out. "Countries are wanting to see more local benefit from economic growth, and a move away from relying on foreign companies and expatriate workers."

Building on the experience of running its own strong branch network in South Africa, SEW-EURODRIVE is excited

about the prospect of building capacity around Africa. This includes more formal training and mentorship of local staff in African branches — to service the continent's already large population of SEW-EURODRIVE motors, gearboxes, geared motors and other equipment.

"Our equipment is to be found in a wide range of industries around Africa — from food and beverage to cement, mining and pharmaceutical," says Obermeyer. "Our hands-on approach to our work means that we understand operating conditions in each country, and so we have developed the expertise to deliver the way our customers require."

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

SKF and Castrol partner to offer access to circular use of industrial lubricants

SKF continues to expand its RecondOil offer through a partnership agreement with Castrol, one of the world's leading lubricant brands. The partnership will enable Castrol industrial customers to use integrated RecondOil Double Separation Technology (DST) systems.

SKFs RecondOil Double Separation Technology (DST) can be used in neat oil

manufacturing processes. It reconditions used fluids and recirculates them back into the metalworking process, reducing consumption and handling of the oil, while improving machine performance in the process.

Thomas Fröst, President, Independent and Emerging Businesses, says: "We recognise the importance of circularity within industrial processes, and

our partnership with Castrol is another step towards making this a reality. By combining SKF RecondOil and Castrol lubrication fluid technology, we can offer 'Oil as a service' solutions that help reduce waste, save energy and improve manufacturing processes."

Kamuran Yazganoglu, Vice President, Industrial, Marine and Energy at Castrol says: "We are committed to

helping customers save waste, reduce carbon and improve people's lives. Our partnership with SKF RecondOil is a great example of how collaboration can further support customers to deliver on their sustainability goals."

The combined service will be offered through fee- and performance-based contracts, initially targeting the metalworking industry.



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Unitrans celebrates 2023 Top Employer Certification

UNITRANS has been certified as a “Top Employer” in South Africa by the Top Employers Institute (TEI). Unitrans offers market-leading integrated operational services and solutions across multiple sectors, including mining, petrochemical, and food and consumer logistics. Unitrans joins 2053 companies in 121 countries globally who have been recognised for their efforts in various facets of employee management.

The prestigious Top Employer certification reaffirms Unitrans’ dedication to create a working environment oriented to the needs and well-being of its employees. “We strive to ensure that each of our employees is seen, heard, appreciated and understood. It is very much a part of our ethos and culture as a com-



Terry Bantock.

pany,” says Terry Bantock, CEO of Unitrans. “At Unitrans, we believe in the power of doing. Being recognised for our continuous investment in our people is a tremendous honour”.

The Top Employers Institute (TEI) is the global authority on recognising excellence in Human Resources (‘HR’) strategy and people practices. For the past 30 years, TEI has given annual award certification to companies with outstanding

culture, work environments, benefits and opportunities for their people. The Institute certifies organisations based on the results of its HR Best Practices Survey, which requires participating companies to undergo a rigorous assessment process. This survey covers six human resource domains consisting of 20 topics, such as People Strategy, Work Environment, Talent Acquisition, Learning, Well-being and Diversity & Inclusion and more.

Participating companies undergo a rigorous assessment process that includes extensive reviews of employer practices, as well as an independent external audit. To become a Top Employer, companies are evaluated according to strict entry criteria and must complete a stringent research process.

MiX Telematics makes fleet management accessible to SMEs

MANY SMEs own and operate vehicle fleets as part of their business but because transportation for these companies is incidental and not their core competency, business owners don’t often think about optimising their fleets. But the fact is, by utilising telematics technology SMEs can gain a competitive advantage.

MiX Telematics has introduced an affordable asset tracking and driver management solution designed specifically for SMEs, **MiX Essential Solutions**. This intuitive suite of solutions is designed for smaller fleets with varying assets, from cars, bakkies, trailers, motorbikes and even generators.

MiX Fleet Manager Essential online platform comprises a sophisticated on-board computer which collects and transmits valuable vehicle and driver data. Driving

events such as harsh braking, speeding, excessive idling, over revving, harsh cornering, and impact events are recorded, giving fleet owners insight into data regarding where a vehicle is, how a driver is operating that vehicle and how much it has been utilised.

If the business needs to visually monitor drivers, the **MiX Vision AI Standalone Dashcam** solution provides camera footage with basic telematics data accessible via the online platform, without the need to install additional hardware. The AI powered dashcam is enabled with Advanced Driving Assistance (ADAS) giving the driver real-time coaching feedback on the trip, and the ability to review performance after the trip. The in-cab and road-facing cameras help prevent collisions, alert drivers to risky



driving behaviour and save on insurance costs from wrongful claims against drivers with the power of video footage available of incidents.

“The light fleet solution provides the perfect balance of functionality and usability that is ideal for small businesses who may not have a full-time fleet manager and require multiple employees to utilise the online platform,” says MiX Telemat-

ics Africa Fleet Sales Director, Henry Smith. “Users can view live tracking, various dashboards and reports including vehicle utilisation, driver scoring, fuel usage and cost analysis breakdowns via the web and mobile app. This easy-to-understand telematics data provides actionable intelligence for informed decision making - saving time and money,” Smith concludes.



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Bespoke solutions for every industry

TRACKING and fleet management solutions provider Ctrack offers a wide variety of solutions aimed at any industry that utilises movable assets.

Throughout their 35-year history, innovation and technology have been at the core of Ctrack's ability to provide their customers with bespoke solutions for an ever-changing environment. Ctrack is a South African company with solutions for South Africans, developed locally, thanks to continuous research and development.

Many of the systems that are commonplace in the tracking and fleet management arena were developed by Ctrack and offered to the market either through a variety of partners, including major insurance companies or under the Ctrack brand.

Integral to this ongoing research and development culture is risk, cost control, fleet utilisation, operations control and asset control. Ctrack believes in full life cycle asset management by harvesting data that is able to provide hindsight, insight and foresight.

"Ctrack understand that every industry and every client has different priorities when it comes to fleet management. The type of cargo has a significant effect on the true focus. While some might value safety above all else, others prioritise operational continuity, and we are able to develop solutions that cater for all of these priorities," says Hein Jordt, Chief Executive Officer of Ctrack Africa.

Hardware is an important component of a robust fleet management system. Over the years, Ctrack has developed various solutions locally that can track powered and non-powered assets as well as supporting equipment such as a host of different cameras.

While this hardware forms the basis of an efficient fleet management system, Ctrack's unique software solutions set them apart and allow them to be all things to all industries.

One of Ctrack's big advantages is their flexibility and making many of these bespoke solutions possible through their proprietary SMILE technology, with which the opportunities are endless.

"Ctrack is able to listen to the needs of our customers and offer them locally engineered solutions that give them the exact results they require to run their particular business safely and efficiently," says Jordt.

With SMILE, the same hardware can be

used to offer an endless array of control and data in a format that makes decision-making easy. The benefits of which have been proven in real-world scenarios time and time again.

When it comes to cash-in-transit vehicles, SMILE can accept 32 digital inputs, giving operators eyes on the

entire vault, door and hatch usage while allowing drivers and fleet managers to activate mitigation actions swiftly. In instances of gunfire, SMILE is able to automatically lock safes, providing an additional layer of protection without the operator needing to do anything.

Within the agricul-

tural sector and with regard to the transportation of precious cargo on often less than ideal roads, SMILE facilitates the setting up of geo-zones and pre-defined speed zones. This has been proven to have a massive effect on the deterioration of road surfaces, the maintenance of vehicles, and

the safe delivery of produce.

SMILE allows for the control of accessories driven off the vehicle's PTO. In the case of side loaders, it is possible to limit their loading and offloading to specific geographic locations, significantly reducing the theft of loads.

Jamming of tracking

and fleet management systems is becoming more prevalent, and with SMILE, Ctrack is able to activate the hooter, hazards or physically immobilise the vehicle when it detects interference.

Ctrack are able to utilise a variety of other valuable data streams such as camera systems

and CAN bus information and with SMILE set up rules and parameters that allow fleet managers to more precisely control assets

For further information contact: Raymond Schulz / Chief Executive Marketing & Sales, 012 450 2222 / email: Raymond.Schulz@ctrack.com






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* Some product functions not immediately available in Africa. Image for illustration purposes only.



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Marine industry finds solutions in cleaning combinations

THE marine sector is always looking for ways to improve safety and performance. Orlichem's Wipe Out, Rigwash, and EcoKleen, are a line of cleaning products that have been internationally approved for marine engineering and are now being used by some of the largest ship repair companies worldwide.

These products have been specifically designed to tackle the unique challenges of cleaning

the marine environment. Wipe Out is a heavy-duty degreaser that can remove even the toughest grime and oil from engines and other machinery. Rigwash is a powerful detergent that can effectively clean the exterior of ships and oil rigs. EcoKleen is a safe, environmentally friendly alternative to traditional cleaning products, making it perfect for use in sensitive areas like freshwater systems and living quarters.

The manufacturers of Wipe Out, Rigwash, and EcoKleen, Orlichem, have emphasized the importance of safety and performance in their products. They have been rigorously tested to ensure that they are safe to use on all types of surfaces and in all conditions and are specially formulated to minimize downtime during cleaning.

The marine sector is highly competitive, and companies are always looking for ways

to improve their operations. Wipe Out, Rigwash, and EcoKleen are the perfect solution for companies looking to streamline their cleaning procedures and maintain the highest level of safety and performance. These products have proven themselves in the field and are now considered the industry standard for marine cleaning.

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



Chantelle Daras, Orlichem's Marine Chemical Specialist.

AA loads first LNG dual-fuelled vessel



ANGLO American size+ vessel, the announces that its Ubuntu Harmony, has newly launched LNG dual-fuelled Cape loaded its first cargo of iron ore from its

Kumba operations in South Africa.

The vessel is the first of ten LNG dual-fuelled new-build ships that Anglo American will introduce to its chartered fleet during the course of 2023 and 2024, delivering an estimated 35% reduction in CO2 emissions compared to ships fuelled by conventional marine oil fuel. The use of LNG will also lead to a significant reduction of nitrogen oxides and particulate

matter from vessel exhausts, while new technology also eliminates the release of unburnt methane.

The Ubuntu fleet is a key component of Anglo American's ambition to achieve carbon-neutrality for its controlled ocean freight by 2040 – with an interim target to reduce emissions from these activities by 30% by 2030 – all part of Anglo American's wider ambition to halve Scope 3 emissions by 2040.

Anglo American has established a comprehensive framework of initiatives for the decarbonisation of its maritime activities, including energy saving devices fitted to existing vessels, the use of voyage optimisation software, and a focus on exploring, trialling and adopting alternative, sustainable fuel options – such as LNG, sustainable biofuel, green methanol and ammonia, and – further

down the line – hydrogen.

The Ubuntu Harmony is a 190 000 ton bulk carrier, flagged in Singapore – the first such LNG dual-fuelled vessel on the country's register – and is designed to be larger than, but as flexible as, a conventional Capesize vessel. The Ubuntu Harmony was built by Shanghai Waigaoqiao Shipbuilding and is owned by U-Ming Marine Transport.

The vessel completed bunkering in Singapore in early January with LNG provided by Shell Eastern LNG. It arrived in Saldanha Bay, South Africa on 19 January to load a full cargo of iron ore that will be transported to customers in China. The Ubuntu Harmony will be followed by its sister ship Ubuntu Equality, the fleet's second vessel, which is expected to load her first cargo in February in South Africa.

Nuclear retrofits technically feasible, economically impractical

By Gary Howard, Sea Trade Maritime News
Feb 02, 2023

THE cost of nuclear power systems makes retrofitting unlikely but the retained value of nuclear material at the end of a ship's life creates interesting financing propositions.

Speaking at a webinar in January, Core Power Technical Director Giulio Gennaro said that from a technical perspective it is possible to retrofit nuclear power onto an existing vessel, just as many other significant engineering works are carried out on vessels during drydock, such as widening. What may stop that from ever happening is the relative cost of building a vessel

and the higher cost of modern nuclear reactors.

"Once when we consider the cost of the nuclear ship as a whole and the cost of the reactor, we see that the cost of the hull is marginal. So in my opinion, there is hardly an economic case in taking an existing conventional ship, which has relatively low residual value, and making a new nuclear ship out of it rather than building a completely new ship," said Gennaro.

While the high upfront cost of building and fuelling a nuclear reactor prohibits retrofit, the lifetime savings on fuel and the residual value of nuclear fuel at the end of a ship's operating life significantly alter the usual financ-

ing model for ships, said William Fennelly, Marine Engineer at Core Power.

Fennelly used an example of a theoretical nuclear-powered newcastlemax, a vessel which would cost around \$100m to build plus \$150m for the reactor and \$250m for its fuel inventory for a total \$500m capital and operational expenditure.

"Consuming bunker fuel, the same ship with a \$60m capex plus fuel at \$600 and carbon taxes at \$100 per ton would cost roughly the same \$500m in combined CapEx and OpEx. Consuming green synthetic fuels like ammonia and methanol, we estimate the costs we could quadruple - that's \$2bn," said Fennelly.

Where nuclear builds an economic lead over traditionally-fuelled vessels is in the residual value of the nuclear fuel over time. A fuel inventory of \$250m could be worth \$500m at the end of a ship's life, with some set aside for decommissioning the reactor.

When a ship reaches the end of its operational life, "the liquid nuclear fuel would be drained from the reactor and loaded into the next generation fast Molten Salt Reactor (MSR) for reuse over another 30 years, and so on and so on.

"Financing the nuclear fuel becomes a very different proposition. We advocate for leasing," said Fennelly.

Core Power's vision for nuclear fuelled ships

does not involve commercial vessel operators becoming licensed operators in the nuclear space. Instead, the fuel energy and reactor are all leased, bundled with liability insurance, reactor operators and maintenance costs.

Even using what they called conservative figures for the inflation of the nuclear fuel's value, a significant margin is created between the actual and financeable value which enables the leasing model.

Core Power Analyst Thomas Davies laid out the case for controlling costs in the building of nuclear ships by using the skilled workforces and efficient modular construction techniques in modern shipyards.

The extremely high

cost and delays of nuclear projects in the energy generation space are include nuclear islands and turbine equipment, but also the difficulties of finding a reliable workforce to commit to long projects and the challenges of on-location construction. Such added costs can often affect the financial viability of projects, said Davies.

"Here is where we believe shipyard construction offers a game changing opportunity. This industry has thrived on large scale fabrication of complex assets. And it's done this by using a skilled, consistent workforce to achieve low cost, high productivity and high-quality construction.

One way that ship-

yards have been able to achieve this is by utilizing modular modular construction, which has allowed the transition to factory fabrication. This way, each module is manufactured in controlled factory conditions and eliminates the need for any size specific work, offering an integrated manufacturing assembly installation process all in one in this way, several processes can be conducted in parallel, reducing time overlaps and increasing construction efficiencies," said Davies.

The knowledge developed in a shipyard environment could also prove significant for the decommissioning of nuclear vessels at the end of their operating life, he added.



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Study: Eating one wild fish same as month of drinking tainted water

By Daniel Lawler

LOCALLY caught fish in rivers and lakes could be a major source of exposure to “forever chemicals” PFAS, new research has warned.

Eating one freshwater fish caught in a river or lake in the United States is the equivalent of drinking a month’s worth of water contaminated with toxic “forever chemicals”, new research said on Tuesday.

The invisible chemicals called PFAS were first developed in the 1940s to resist water and heat, and are now used in items such as non-stick pans, textiles, fire suppression foams and food packaging.

But the indestructibility of PFAS, per- and polyfluoroalkyl substances, means the pollutants have built up over time in the air, soil, lakes, rivers, food, drinking water and even our bodies.

There have been growing calls for stricter regulation for PFAS, which have been linked to a range of serious health issues including liver damage, high cholesterol, reduced immune responses and several kinds of cancer.

To find out PFAS contamination in locally caught fish, a team of researchers analyzed more than 500 samples from rivers and lakes across the United States between 2013 and 2015.

The median level of PFAS in the fish was 9,500 nanogrammes per kilogram, according to a new study published in the journal Environmental Research.

Nearly three quarters of the detected “forever chemicals” was PFOS, one of the most common and hazardous of the thousands of PFAS.

Eating just one freshwater fish equalled drinking water with PFOS at 48 parts per trillion for a month, the researchers calculated.

Last year the US Environmental Protection Agency lowered the level of PFOS in drinking water it considers safe



Non-stick pans are among the products that use PFAS, which have been linked to a range of serious health issues.

to 0.02 parts per trillion.

The total PFAS level in the freshwater fish was 278 times higher than what has been found in commercially sold fish, the study said.

‘Greatest chemical threat’

David Andrews, a senior scientist at the non-profit Environmental Working Group which led research, told AFP he grew up catching and eating fish.

“I can no longer look at a fish without thinking about PFAS contamination,” said Andrews, one of the study’s authors.

The findings were “particularly concerning due to the impact on disadvantaged communities that consume fish as a source protein or for social or cultural reasons,” he added.

“This research makes me incredibly angry because companies that made and used PFAS contaminated the globe and have not been held responsible.”

Patrick Byrne, an environmental pollution researcher at the UK’s Liverpool John Moores University not involved in the research, said PFAS are “probably the greatest chemical threat the human race is facing in the 21st century”.

“This study is important because it provides the first evidence for widespread transfer of PFAS directly from fish to humans,” he told AFP.

Andrews called for much more stringent regulation to bring an end to all non-essential uses of PFAS.

The study comes after Denmark, Germany, the Netherlands, Norway and Sweden submitted a proposal to ban PFAS to the EU’s European Chemicals Agency on Friday.

The proposal, “one of the broadest in the EU’s history,” comes after the five countries found that PFAS were not adequately controlled, and bloc-wide regulation was needed, the agency said in a statement.

Farewell to ‘forever’: Destroying PFAS by grinding it up with a new additive

By American Chemical Society

PER- and polyfluoroalkyl substances (PFAS) are potentially harmful substances known as «forever chemicals» because they are so difficult to destroy. One emerging technique to degrade PFAS involves forcefully grinding them with metal balls in a moving container, but this technique can require corrosive additives. Now, in Environmental Science & Technology Letters, researchers report a new type of additive for “ball milling” that completely breaks down PFAS at ambient temperature and pressure.

Solid PFAS contamination is an ongoing issue for soil near waste sites, manufacturing sites, and facilities that frequently use firefighting foam. Currently, the U.S. Environmental Protection Agency recommends incineration to destroy these substances, but concerns remain about whether this energy-intensive method can effectively prevent environmental contamination.

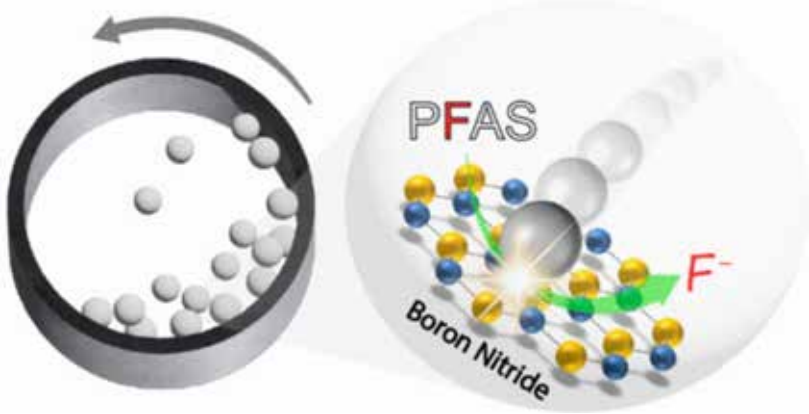
Another option is ball milling, a process that mixes PFAS and additives with metal balls at high speeds. Collisions between the balls and additives create solid-state reactions that break the carbon-fluorine bonds on PFAS and convert

them to less harmful products. A common additive for this process is potassium hydroxide (KOH), but it forms problematic clumps and is corrosive.

To overcome these limitations, Yang Yang and colleagues turned to boron nitride, a piezoelectric material that generates partial electrical charges and can accept electrons when deformed by mechanical forces. They now report a ball milling process that uses boron nitride as a non-corrosive additive to react with and destroy PFAS.

As a proof-of-concept for the new additive, the team ball milled two legacy PFAS compounds with boron nitride and analysed the products. By optimizing the ratio of boron nitride to PFAS, the team almost completely removed the fluorine atoms from PFAS in four hours at ambient temperature and pressure, effectively destroying it. The method also broke down 80% of known PFAS from soils contaminated with firefighting foam after six hours.

In both experiments, boron nitride degraded PFAS more efficiently than when KOH was used. Further analyses suggest that boron nitride accepts electrons and fluorine atoms from PFAS, which then breaks into fluoroalkyl radical species that react with oxygen or other radicals to ultimately produce innocuous minerals. This new method could open the door for future mechanical-force-based PFAS remediation strategies, say the researchers.



Graphical abstract. Credit: Environmental Science & Technology Letters (2023). DOI: 10.1021/acs.estlett.2c00902

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Bring on the miracle voting machine

THE elections are due next year and the druids of politics are chanting that we had better get onto it now. Well, 2024 is a special year, being exactly three decades since that 4-day event in 1994 – when we presented the world with our home-made miracle.

Seriously? Well, it has become the self-congratulating accepted memory – so this is as good a time as any to revisit what really happened. As for my photographic memory about it, I owe that to Dr Anthea Jeffery's book *People's War* – new light on the struggle for South Africa, published by Jonathan Ball in 2009.

The Inkatha Freedom Party (IFP) was included six days before the election. Ballot papers were already printed and 80 million IFP stickers now had to be distributed to 10'600 polling stations ... wait for it.

On April 26, the first polling day, voters formed those snaking queues we remember with pride. But why did that happen?

One reason, many voting stations did

not open at all. Others had severe shortages of ballot papers, the special ink to mark voters' hands, the ultraviolet light to detect the ink, or the IFP stickers. The chaos continued on April 27, then April 28 was declared another public holiday – and many people voted on April 29. Some polling stations still had not opened, but the IEC said enough was enough.

There was no voter's roll, at the ANC's insistence. People could vote wherever they wanted, not only where they lived. It was thus completely legal to bus voters to marginal areas. The ANC also insisted that obsolete ID documents be allowed and that people with not even those receive temporary ones. The NP objected at first, but later folded. Everyone could vote, as often as they liked. In southern Natal, for instance, votes outnumbered the population by 2:1.

A police investigation found that "millions of foreign nationals had fraudulently" received voter cards.

The safeguard of special ink and ultraviolet light broke down widely. People who had placed their hands in bleach and admitted doing so, were allowed to vote (again).

At numerous polling stations, particularly where the IFP had strong support, the IFP stickers simply did not arrive. Millions of them were later found in IEC warehouses.

Then came the counting.

On day one, April 30, a vital safeguard was scrapped: the number of ballot papers issued to a polling station would no longer be reconciled with the number of votes.

As controversy dragged on, NP and ANC leaders began to realise they were facing a failed election, not a democratic miracle. That is when they started negotiating again, this time not about elections but about the result. De Klerk, Mandela and IEC chairman Judge Johann Kriegler met to find a solution. A government source said they "decided that free and fair

OPINION

ON THE CONTRARY

The columnist is a journalist and editor based in Onrusrivier. His awards for journalistic excellence include the Mondi and the Sanlam Awards.

Pieter Schoombee



elections had to be declared, come hell or high water".

The hatchets were buried and between them they agreed on a result. Judge Kriegler declared it "beyond review or appeal".

He resigned before the next election.

Email: noag@maxitec.co.za

Wearable electronics woven into gear can reduce fire-fighters' rate of injury and mortality

By Tsinghua University Press

FIREFIGHTING may look vastly different in the future thanks to intelligent fire suits and masks developed by multiple research institutions in China.

Researchers published results showing breathable electrodes woven into fabric used in fire suits have proven to be stable at temperatures over 520°C. At these temperatures, the fabric is found to be essentially non-combustible with high rates of thermal protection time.

The study was published on January 12, 2023 in *Nano Research*.

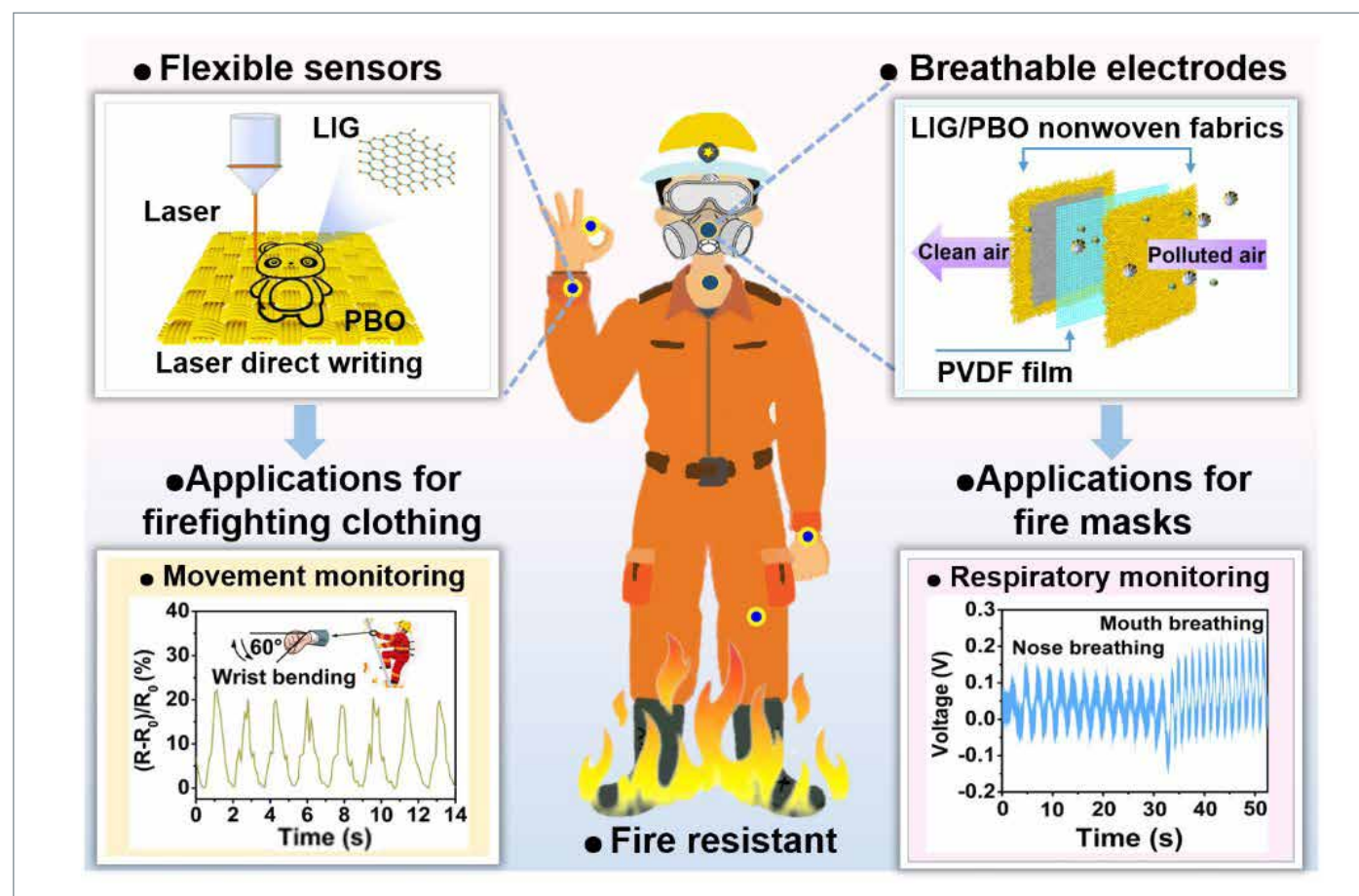
The results show the efficacy and practicality of Janus graphene/poly(p-phenylene benzobisoxazole)—or PBO—woven fabric in making firefighting "smarter" with the main goal being to manufacture products on an industrial scale that are flame-retardant but also intelligent enough to warn the firefighter of increased risks while traversing the flames.

"Conventional firefighting clothing and fire masks can ensure firemen's safety to a certain extent," said Wei Fan, professor and researcher at the School of Textile Science and Engineering at Xi'an Polytechnic University. "However, the fire scene often changes quickly, sometimes leaving firefighters trapped in the fire for failing to judge the risks in time. In these situations, firefighters also need to be rescued."

The key here is the use of Janus graphene/PBO, woven fabrics. PBO fibers offer better strength and fire protection than other similar fibers, such as Kevlar. The PBO fibers are first woven into a fabric that is then irradiated using a CO2 infrared laser. From here, the fabric becomes the Janus graphene/PBO hybrid that is the focus of the study.

The mask also utilizes a top and bottom layer of Janus graphene/PBO with a piezoelectric layer in between that acts as a way to convert mechanical pressures to electricity, and vice versa.

"The mask has a good smoke particle filtration effect, and the filtration efficiency of PM2.5 and PM3.0 reaches 95% and 100%,



SCIENTISTS from multiple institutions address the challenges and limitations of current fire-fighting gear by introducing wearable, breathable sensors and electrodes to better serve firefighters. Credit: *Nano Research, Tsinghua University Press*.

respectively. Meanwhile, the mask has good wearing comfort as its respiratory resistance (46.8 Pa) is lower than 49 Pa of commercial masks. Besides, the mask is sensitive to the speed and intensity of human breathing, which can dynamically monitor the health of the firemen," said Fan.

Flame-retardant electronics featured in these fire suits are flexible, heat resistant, and quick to make and low-cost, which makes scaling for industrial production a tangible achievement. This makes it

more likely that future firefighting suits and masks will be able to effectively use this technology. Quick, effective responses can also reduce economic losses attributed to fires.

"The graphene/PBO woven fabrics-based sensors exhibit good repeatability and stability in human motion monitoring and NO2 gas detection, the main toxic gas in fires, which can be applied to firefighting suits to help firefighters effectively avoid danger," Fan said. Being able to detect

sharp increases in NO2 gas can help firefighters change course in an instant if needed and could be a lifesaving addition to firefighter gear.

Major improvements can be made in the firefighting field to better protect the firefighters by taking advantage of graphene/PBO woven and nonwoven fabrics. Widespread use of this technology can help the researchers reach their ultimate goal of reducing mortality and injury to those who risk their lives fighting fires.