

# Business News

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## ‘Powerships’ concept goes nuclear

Putting the cat amongst the pigeons – certainly as far as South Africa is concerned – is an announcement by shipbuilders, Samsung Heavy Industries (SHI) in South Korea, and Danish energy company Seaborg Technologies, who have signed a partnership agreement to develop Floating Nuclear Power Plants or Power Barges which promise in addition to generating ‘clean’ electricity, can utilise waste heat from the reactor as a power source for hydrogen and ammonia plants.



Artist's impression of moored Power Barge.

SAMSUNG Heavy Industries (SHI) and Seaborg have entered into a partnership agreement to develop floating nuclear power plants based on Seaborg's inherently safe Compact Molten Salt Reactor (CMSR). The agreement includes development of hydrogen production plants and ammonia plants, as the CMSR is claimed to be an ideal power source for supply of stable, clean, and safe electricity.

(The concept of a moored power station will be familiar to followers of the controversial Powerships tender but instead of using the price volatile and carbon intense LNG to produce electricity, this concept interestingly utilises nuclear in the form of a SNR – small nuclear reactor. Ed)

CMSR is a carbon-free energy source that can efficiently respond to climate change issues and is a next-generation technology that meets the vision of Samsung Heavy Industries. In addition, when an abnormal signal occurs inside the reactor, the liquid nuclear fuel, molten salt, is solidified to prevent serious accidents at the source, and provides high safety and high efficiency power and hydrogen production at the same time.

“Through this agreement, we plan to pioneer the CMSR-based floating nuclear power plant market as part of strengthening its future new business opportunity” says Jintaek Jeong, president of Samsung Heavy Industries.

“We are honoured and proud to have formed this partnership with Samsung Heavy Industries, one of the world's largest and most experienced shipyards. It is another step forward in our quest to introduce a new generation of nuclear reactors that are clean and safe and can be built using industrial technology with all the benefits of scalability, speed, and lower costs,” says Troels Schönfeldt, CEO and co-founder of Seaborg.

The aims of the strategic partnership is to factory manufacture and sell turn-key power plants in volume, ready to be moored at industrial harbours and connected to the electric grid onshore.

The stable production of energy also offers a fundamental basis for production of all Power-2-X fuels, where especially hydrogen and ammonia are considered a future energy source to replace traditional fossil fuels. The design of the hydrogen,



Infographic of Seaborg Compact Molten Salt Reactor. Reactor vessel's height is 2.4m and the diameter is 2.2m. Thermal capacity: 250 MWt, Electrical capacity: 100 MWe.

ammonia and power units will be optimized for efficient serial construction at SHI's shipyards.

### About the CMSR-based Floating Nuclear Power Plant

The floating nuclear power plant comes as a turn-key product, ready to be moored at an industrial harbour. In the harbour, a transmission cable will be connected to the electric grid onshore. An optional solution is to place a hydrogen or ammonia production plant next to the floating nuclear power plant utilizing the CO2-free fission energy to produce hydrogen and ammonia. The floating nuclear power plant design is modular delivering up to 800 MW-electric for the 24-year lifetime and cost competitive whether it plugs into the grid in an existing coal port or powers production of hydrogen and ammonia.

When an abnormal signal occurs inside the reactor, it is designed to solidify molten

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## Diarise: Enlit Africa – 7-9 June 2022 at CTICC



RENEWABLE energy has the opportunity to deliver an energy sector that is providing decarbonised energy access to communities across Africa, bringing the realisation of a just energy transition just a little bit closer to reality.

The tale of renewable energy in Africa is one in which electrification and power development is happening at an ever-increasing rate and innovative technology is being adopted to meet the imperative of SDG7 and sustainable energy for all.

The upcoming Enlit Africa (formerly African Utility Week and POWER-GEN Africa), taking place between 7-9 June 2022 at the Cape Town International Conference Centre, will be the platform in which these innovations are unpacked and shared with a global audience. It is Africa's leading exhibition and conference for the sector, gathering the power and energy industry's most influential professionals and decision makers from across the continent for three days of relevant, accredited technical and strategic conference seminars, valuable networking opportunities and access to world-class products and solutions.

Known for its compelling content and speakers, the organisers will not disappoint, with two keynotes and all of the content presented in speaking hubs on

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## 'Powerships' concept goes nuclear

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salt, a liquid nuclear fuel, to prevent serious accidents at the source, providing high safety and high-efficiency power and hydrogen production at the same time.

The core of this concept is Seaborg's Compact Molten Salt Reactor –CMSR. Conventional nuclear reactors have solid fuel rods that need constant cooling, typically using water under high pressure.

In the CMSR, fuel is mixed in a liquid salt that acts as coolant. This ensures it can always be cooled and it cannot melt down or explode. It will simply shut down by itself in case of an emergency. The importance of this is not only the safety but also a significant reduction in complex-

ity and cost.

### Time line

According to company spokesperson Per Mikael Jensen, in an exclusive CBN interview with Editor Robin Hayes, Seaborg originally estimated to have a prototype CMSR plant operational by 2026, but the war in Ukraine has pushed this date out to "around 2028, due to the disruption in the nuclear market with Russian suppliers of e.g., enriched uranium being irrelevant. We are now in negotiations with other potential suppliers" he said.

"Our pursuit to make nuclear an inexpensive, sustainable and safe technology has been eight years in the making and is

based on designs that were first developed in the 1950's and 1960's but largely abandoned due to the absence of advanced technologies at the time".

### Factory assembly – like a car plant

While Seaborg has a pocket of excellence in the design and development of the CMSR plant, it was a logical step to partner with SHI who have extensive expertise in the nuclear field and in heavy engineering and manufacturing industries. South Korea is a world leader in the field of nuclear engineering which exports its technology widely. The country boasts 23 nuclear reactors providing 23GWe.

"The concept of

building CMSR's on a production line – similar to a car factory – presents many advantages over site constructed plants and we estimate that up to fifty or more 100MW containerised plants could be constructed each year. These would be integrated with SHI's shipbuilding expertise to complete the 'Barge' package".

### Conclusion

Nations, particularly in the West, are arrogant in their vision for energy delivery in less developed typically Equatorial countries where resources for renewable energy simply don't exist - limited or no potential for hydropower, where the sun doesn't shine often, or where

the wind rarely blows. These countries, like Vietnam for example, plan to construct many more coal fired power stations to meet their need for energy in the future.

It must also be remembered that to manufacture one 3MW wind turbine can take up to 5t of copper which means excavating 5 000t of copper bearing ore! Also some solar panels use a particularly nasty greenhouse gas – man made nitrogen trifluoride - in their manufacture. There's nothing 'green' or sustainable about either of these processes! (Ed.)

"That's where the CMSR concept has the potential to revolutionise energy delivery in years to come" concluded Jensen.

## A brief history of tap water

By Chetan Mistry,  
Strategy and  
Marketing Manager,  
Xylem Africa

ANCIENT humans often settled near water. Roughly 12 000 years ago, people started to practice agriculture and animal rearing. One of the earliest examples is Jericho in Israel, considered the oldest still-active city in the world. Ten thousand years ago, the first people settled there to use natural springs that still run today.

But even older sites, such as the mysterious Göbekli Tepe in Turkey, shows human settlement and trade activity around rivers - it's believed people abandoned the site after local river patterns changed.

Taming water for

civilisation

Archaeologists have uncovered many early examples of water management and sewage systems from the early copper age that started roughly 6 000 years ago. The ancient city of Mohenjo-Daro, today in modern Pakistan, had channels to supply drinking water and remove wastewater directly from buildings. The Qin and Han dynasties built water and sewage systems in China's Yellow River valley. In Central America, Mayans carved cisterns and tunnels out of bedrock that created the earliest pressurised water systems we know of.

The Minoans, on the island of Crete, built some of the earliest known public waterworks. But perhaps most famous are the enormous Roman aqueducts

that fed water to millions of people - the Acqua Vergine aqueduct still transports water today!

### Sanitation becomes important

Even though the Romans could move water, they did poorly at keeping it clean. For example, they used cramped public toilets without washing their hands. Although cities have used open channels to move wastewater for thousands of years, it was only around the 1300s that covered sewage tunnels appeared to help control the smell.

Then, 400 years ago, Sir Francis Bacon applied the scientific method to experiment with water and explain different purification techniques. Not long after, the Dutch scientist Antony van Leeuwen-

hoek used a microscope to discover waterborne bacteria. Eventually, humans realised that dirty water leads to diseases such as cholera.

### Water from the tap

We have found examples of ancient taps made by the Romans and later civilisations. But taps back then served different purposes: water pipes were rare and expensive, so most people collected water with buckets. Taps were primarily valves to manage water distribution or drain storage barrels (hence the name 'tap', for when a faucet is 'tapped' into a barrel).

People started adding taps into homes as waterworks and pipe networks became more commonplace in the 1700s and 1800s. The French emperor

Napoleon had massive waterworks built to serve the growing cities of his realm.

Thomas Grill in the 1800s invented the first screw tap - the grandfather to modern taps. Now we could control the flow of water to an incredible degree.

### Water today

When you open a tap and water pours from it, that results from thousands of years of innovation. Today, we get clean water through gigantic and complicated water networks that pump billions of litres of water to serve millions of people.

Thanks to these efforts, fewer deaths are due to diseases such as cholera. Today, we see water as a basic human right, but we shouldn't take it for granted. We're looking



for trouble wherever we neglect our water infrastructure or treat water as an infinite resource. Xylem's mission is to solve water for all. We focus on the innovation, design, delivery and support of water infrastruc-

ture that supports everything from large waterworks to residential taps. For Xylem, water and prosperity are inseparable.

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# Coffee craze sparks opportunities post Covid

By Robin Hayes

AGAINST a backdrop of adversity, firstly the pandemic, then a medical catastrophe, the rise and rise of the coffee business has created a lifeline for many of those affected. The editor discusses their stories with Chris Miliias and Jerry Finley; two such individuals affected in different ways.

“IT’s an ill wind that blows nobody any good” so the proverb states and some may scratch their heads as to how anything good may have come out of the COVID 19 pandemic, but, as they say, life goes on and people make a plan, and sometimes that plan turns into something good and unexpected.

So it has been with certain suppliers to the coffee ‘society’, some may say a fad or fashion that comes and goes but its popularity has certainly reached a craze here in our metropolises, Cape Town especially where the growth of coffee shops and restaurants serving ‘designer’

brands and specialties abound. Lockdown sufferers now crave to socialise and what better place than a coffee shop?

Local distributor of the famous Italian brand, Illy, Chris Miliias has been in the coffee business for more than 24 years, purveying different brands but since 2005 it has been with the Illy label.

“Right now we are experiencing a wave of high demand for premium coffee brands and with relatively low barriers to entry, competition is fierce” said Chris.

“Apart from the fashion upswing, the pandemic cost many people their jobs and businesses and it didn’t take long for those badly affected particularly from the hospital-ity industry, to recognise the opportunities presented by the coffee business.

“There has been a proliferation of new coffee shops and corner kiosks opening and even mobile trailer mounted coffee outlets, all designed to satisfy the public’s craving,

which incidentally has switched from a 90% preference of filter coffee to Cappuccino – filter only having a 5% market share amongst brands.

“Owners of restaurants that survived the lockdown have quickly realised that public tastes are fickle and they must have a premium coffee brand available to complement their food offering if they are to prosper.”

With Illy at the forefront and offered in prestige outlets such as the Mount Nelson Hotel, Table Mountain Café, The Bala Restaurant in the Waterfront, Rusto in Canal Walk, the Oppikoffie group of coffee shops, The Lighthouse Café in Blouberstrand and recently added the Gusto restaurant in Century City, one would think that Chris would be riding a wave of euphoria, but that passion was cut short when six months ago, he was diagnosed with a brain tumour. Five months of hospitalisation saw Chris have nine brain operations coupled for good mea-

sure, with a dose of Covid and loosing 27kg as specialist surgeons and medical teams battled to save his life, and, they did.

While in virtual solitary confinement in hospital, Chris’ wife and son stepped into the breach to keep the Illy flag flying in a post Covid Cape Town and now with Chris on the mend and back in the saddle, but with a very different outlook on life, Illy coffee should be seen at many more establishments.

While not of the medical kind, Blouberstrand’s Lighthouse Café owner Jerry Finley suffered similar adversity when his popular guest house business of 18 years standing, imploded due to the lockdown.

“Most of my clientele were overseas visitors and literally overnight the lockdown regulations wiped out a lucrative business” he explained.

“As the regulations eased and more and more people were allowed to resume their ‘normal’ lives, the beachfront at Small



From Summit to Sea: seen here at the Table Mountain Café on top of Table Mountain are left to right Ronald Ramsamy, F&B Executive at Table Mountain Café by TMACC, Jerry Finley, Lighthouse Café owner and Chris Miliias Illy coffee’s distributor in the Western Cape.

Bay proved again to be a popular venue, and while idling away some time I noticed the volumes of people heading for the beach was significant, and that was the lightbulb moment when I decided to turn a failed guest house into an Illy Coffee shop! I had the location on the only access to the Beach and coupled with that a beautiful ‘Seaside

Garden’ where people could gather, socialise and of course, drink coffee and have a pastry, while being treated to the best views over the City, the Mountain and Robben Island.

“Over a short few months the Lighthouse has gained enormous popularity throughout the day but particularly for the ‘early birds’ – runners, walkers and

cyclists who after their exercise spend a relaxing half an hour sipping cappuccino, eating a pastry and socialising before going off to work” concluded Jerry.

So the proverb seems to ring true for at least these two individuals who have turned adversity into opportunity while taking their lives and fortunes in different directions.

## Mobile data memory for IO-Link: small in size, big in space

THE external IO-Link memory DSU is a mobile all-purpose device for local data transmission. Connected to an IO-Link master, the small device makes the stored data available to all connected receivers. For example, if used as a digital type label for an interchangeable tool, the PLC can identify it independently and reliably, extract information about operating hours and alert the operator when maintenance is due to prevent damage to the tool or workpiece. During operation, the data is continuously written to the historical memory. Thanks to the COM3 interface with 230.4 kbit/s per second. A total of 128 kBytes offer enough space for all relevant data.



eterised and read via the IoT software moneo|configure. In this way, recorded data of total operating hours, maintenance intervals or system-relevant maximum and minimum values such as pressure, temperature or vibration data, can be easily read. An optional write protection protects against accidental overwriting of sensitive device information.

carrier which serves as a storage medium in industrial environments. Parameter setting and data exchange take place via the integrated IO-Link interface and can be carried out, for example, via the moneo|configure software while the system is not in operation.

eter addresses and the necessary information about the required IO-Link hardware and software can be found at [www.ifm.com/za](http://www.ifm.com/za)

### Operating modes of the device

The device supports various operating modes, such as reading the device-specific globally unique UID, reading and writing up to 28 bytes of data in one IO-Link cycle and reading and writing larger amounts of data, with length restrictions usually only imposed by the PLC. Automatic access to the memory stick during operation can be defined via numerous commands that regulate and control the read and write access.

### Device-specific information

The IODD required for the configuration of the unit, detailed information about process data structure, diagnostic information, param-

### Configuration and reading of data via moneo|configure

The IO-Link memory can also be param-

### Description of the technology

The DSU100 is a 128 kBytes FRAM data



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# Plastics industry – cleaning up the environment

By David Poggiolini

THE South African plastics industry's collection and recycling initiatives are having a positive effect on lessening the amount of plastic waste in the environment and society. This is evidenced by the amount of recycling of plastic waste that is already being undertaken in the country – although off a low base – and initiatives geared at keeping our water-catchment areas free of plastic litter.

Plastics SA Executive Director, Anton Hanekom, says, "There has been a 35% increase in the use of recycled content in plastic products over the last 10 years, and this will continue to be a big drive for the industry moving forward. Up to 43,7% of the plastic products that are being produced in the country are being collected. The South African

recycling value chain is long, with costs added and materials lost along the way. Ultimately, we recycle up to 22% of plastic waste that passes through this process. This is much higher than some countries in the world."

There has been a notable increase in the consumption of plastic packaging products in the country and this can be attributed to the high demand for health and hygiene products during the Covid-19 pandemic. This was especially the case throughout 2020 when very strict measures were implemented to contain the spread of the virus. The plastics industry grew from 17% of manufacturing gross-domestic product (GDP) by number prior to the outbreak of the pandemic to 20% of GDP by number. The per-capita consumption of plastics products is about 24kg per South African citizen and 29kg per person when adding



Collection point for discarded plastic.

recycled content.

Douw Steyn, Sustainability Director of Plastics SA, says that the industry is working hard to improve its reputation considering concerns regarding the impact of plastic waste on the environment and societies. Of particular concern is the amount of plastic waste that is also ending up in the oceans and on beaches. "Research has shown that 80% of

litter on beaches and in the oceans consists of land-based waste. It for this reason that we have launched a number of initiatives geared at keeping our country's river-catchment areas clean of plastic waste," Steyn says.

Working closely with all relevant stakeholders, including the various levels of government, Producer Responsibility Organisations (PROs) and

educators, Plastics SA's projects in these areas encompass waste management and recycling and education, training and awareness. This is in addition to clean-up campaigns, which are an absolute last resort.

A sound example of such a project is Inkwazi Isu in the KwaZulu-Natal South Coast. Inkwazi Isu is isiZulu for Fish Eagle. The project was so named because Fish Eagles returned to various catchment areas in the region after various interventions were implemented to keep them clean. The programme was launched after a flash flood washed up tons of plastic litter onto beaches.

It is being coordinated by the KZN Marine Waste Network South Coast. Established by various stakeholders, KZN Marine Waste Network South

Coast works with industry participants, such as Coca Cola Beverages South Africa, Sasol, Petco and Polycyco, as well as Polystyrene Association of SA, Plastics SA and local community leaders.

Coca Cola Beverages South Africa sponsored a Unimog equipped with a beach rake to remove smaller plastic particles that cannot be collected by hand. It is being operated by the Clean Surf Project, a local non-government organisation (NGO). Sasol funded the Baseline Study to quantify the problems and inform interventions required to address the problem through education, collection at source, recycling and the cleaning up of rivers.

Notably, local informal recyclers, small businesses and NGOs have also been empowered to help change mindsets around used plastics to encourage more recycling.

At the same time, work is progressing on diverting plastic waste to South Africa's landfill sites through the Extended Producer Responsibility (EPR) programme. This is in line with the recently published Section 18 Regulations to the National Environmental Management: Waste Act on 5 November 2020. The regulations, which came into effect on 5 May 2021, makes EPR mandatory for all produc-

ers and importers of packaging. It changes how producers, brand owners, retailers and importers design, produce, sell and keep their products in the recycling loop as far as is practicably possible. Any company or brand that makes or imports any form of plastic packaging for distribution is required to pay an EPR fee per ton. State has established strict targets for yearly collection and recycling that need to be met over the next five years.

While already in full effect, the industry is still waiting for Environment, Forestry and Fisheries, Minister Barbara Creecy, to approve the proposed fees that need to be paid to the PROs by producers.

Shabeer Jhetam, Chief Executive Officer of Packaging SA urged plastic producers to pay their fees, despite these delays, noting that they would either be credited or debited depending on the feedback received from Minister Creecy.

"The Minister has noted that until such time that industry has received consensus, producers need to pay their fees to comply with existing legislation. Many producers are currently not paying, and this will negatively impact the PROs which will not be able to fund their various EPR schemes and meet their targets."

## Direct access to stakeholders responsible for major port projects

THE 10th annual Transport Evolution Africa Forum & Expo that is to be held on 28 - 29 September 2022 will unpack and give a detailed status update on all upgrades and plans throughout African ports. Stakeholders within the African transport sector will meet in Durban to discuss, showcase, and exchange ideas in preparation to tackle the large pipeline of projects recently announced.

A bundle of investments valued at more than R26 billion in South Africa's oceans economy, and that will create hundreds of new jobs, has been revealed by Transport Minister Fikile Mbalula. These investments will result in:

- The Strategic Fuel Fund constructing an onshore Liquid Natural Gas (LNG) regasification

facility at the Port of Ngqura at an estimated cost of \$1.5 billion.

- Mnambithi Terminals investing R1.5 billion to develop and operate a liquid bulk terminal at the Maydon Wharf 6 in the Port of Durban.
- Hillside Aluminium, owned by JSE-listed commodities multinational South32, renewing existing leases in the Port of Richards Bay for [a] bulk storage silos facility, pitch tanks terminal, stockyard facility and conveyor belt system effluent pipeline facility, resulting in R338 million revenue to Transnet and the municipality of Richards Bay, R2 billion a year in local procurement expenditure and R1.1 billion

a year in contribution to the tax base.

- The renewal of existing leases by Dormac Marine Engineering that generate rental income for Transnet and eThekweni Municipality, which is currently worth R17.5 million a year.

Speaking recently at the Port of Durban, Mbalula said these critical investments will contribute towards progressing South Africa's interests through Operation Phakisa. Operation Phakisa is an initiative of the South African government that is designed to fast track the implementation of solutions on critical development issues.

For further information contact: [NatalieKruger@dmgevents.com](mailto:NatalieKruger@dmgevents.com)

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# Diarise - Manufacturing Indaba - 21 – 22 June 2022

The longstanding manufacturing conference and exhibition will be returning to the physical event realm after adopting an exclusively virtual approach over the past two years of the pandemic.

THE 9th staging of the Manufacturing Indaba conference and exhibition will be returning as a face to face event after adopting an exclusively virtual approach over the past two years. The 2022 edition is to be hosted from the 21 – 22 June 2022 at the Sandton Convention Centre in Johannesburg.

## Reigniting economic growth through manufacturing

Manufacturing plays an unequalled role in driving economic development, affecting the overall GDP and productivity of a nation. A rise in manufacturing output induces production in the manufacturing sector as well as in other sectors through direct production linkages and indirect multiplier effects, hence driving the growth of the economy in its entirety.

“...the re-ignition of manufacturing boosts a wider range of activities, including those within the services sector.”

Further, manufacturing provides multifaceted productive advantages. First, mass production implies economies of scale: The more units produced, the lower the per-unit cost, and thereby increasing the value of outputs per input. Second, manufacturing is inclined to have strong linkages to other economic sectors, creating demand for skills, inputs, manufacturing components, transportation, and storage. Therefore, the re-ignition of manufacturing boosts a wider range of activities, including those within the services sector. Third, most innovation and technological advances originate in the manufacturing realm, which then spill over into other industries, consequently enhancing their levels of productivity.

Capitalising on the continent's resources and opportunities presented by significant shifts in the structure of global production ensures the implementation of domestic manufacturing and a commodity-based industrialisation process. This provides immense opportunities for job creation across South Africa. Harnessing Afri-

ca's opportunities for industrialisation involves adding value to domestic products, soft and hard commodities and developing forward and backward linkages to the regional and international value chains. Moreover, it remains essential to

develop and expand SMEs, industry clusters and the establishment of private-public partnerships to leverage resources for financing the industrialisation process.

Further, implementing the African Continental Free Trade

Area Agreement (AfCFTA) can develop regional value chains and accelerate productive transformation if African entities can harness digital innovations to reduce production costs and leaders can create policies for skills development,

public procurement, and foreign investment to further reinforce industrial linkages.

The upcoming in-person symposium is anticipated to make a long lasting and positive impact on manufacturing communities by enabling attendees

to identify significant participants, speakers, financiers, influencers, and leaders, thereby giving them the means to not only survive, but thrive in this intensely competitive sector. Attending this event affords participants with superior

knowledge to develop advanced solutions and business models, as well as access to new markets, new clients and the opportunity to grow prosperous manufacturing businesses, ultimately contributing to the nation's economic growth.

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## THE BEE IN MY BONNET COLUMN

# Always learn from clever people

WHY is it that there is no third party compulsory vehicle insurance in South Africa?

With the collapse of the Road Accident Fund (RAF) – currently in hock to the tune of over R40bn and rising, why haven't the insurance industry pushed for mandatory third party insurance? It should be additional business for them, and a blessing for the citizens of the country, so why not?

We have the most ridiculous state of affairs in South Africa. Anyone, and I mean anyone, can purchase,

borrow or steal a motor vehicle and use it on the open road cheek by jowl with other road users, WITHOUT having any form of insurance what so ever. This is only demanded when a vehicle is financed through a bank or vehicle finance company, but according to SAIA (South African Insurance Association), only 35% of vehicles on our roads have any insurance.

Furthermore, as mandatory roadworthy examinations are only required when a vehicle legally changes hands, there's every

chance that you will be in a collision with a un-road worthy vehicle, driven by an unlicensed driver who has no insurance. A great situation that nobody in authority is doing anything about.

When one considers that, according to statistics, more than 50% of 'drivers' of motor vehicles have never undergone a competence test and bought their licences from corrupt officials, it's no wonder that the country's accident rate and death rates are so high.

Apart from the human tragedy, the

cost to the country is probably incalculable and includes medical and administrative costs, time away from work (if you have a job – which for 35% of the working population this doesn't matter), police and public administration time and of course, the RAF which doesn't work anyway and now takes years, if you're lucky, to settle a claim.

Should you as a dutiful citizen with a legal drivers licence and comprehensive insurance be involved in a motor accident with an un-insured individual,

then while your insurance may pay for your damage and medical costs, it will ultimately reflect upon your insurance premium by losing your no-claim bonus and having to pay an excess portion of your claim or both.

While it seems that South African motor insurance companies don't work on a no-blame model for the benefit of their customers, they will try to recover their liability from the other party, providing that they are similarly insured. If not then, its hard luck to them. And hard luck

to you as your insurance company, should they recover the cost of your accident from the other party, are not obliged to reinstate your no-claim bonus. And will probably increase your risk profile and that means a higher premium. But someone has to pay, hey?

To add insult to injury, we all pay to the dysfunctional RAF every time we fill up with petrol or diesel, to the tune of 10% of the fuel price, which nets the RAF some R45 billion annually. According to OUTA, these

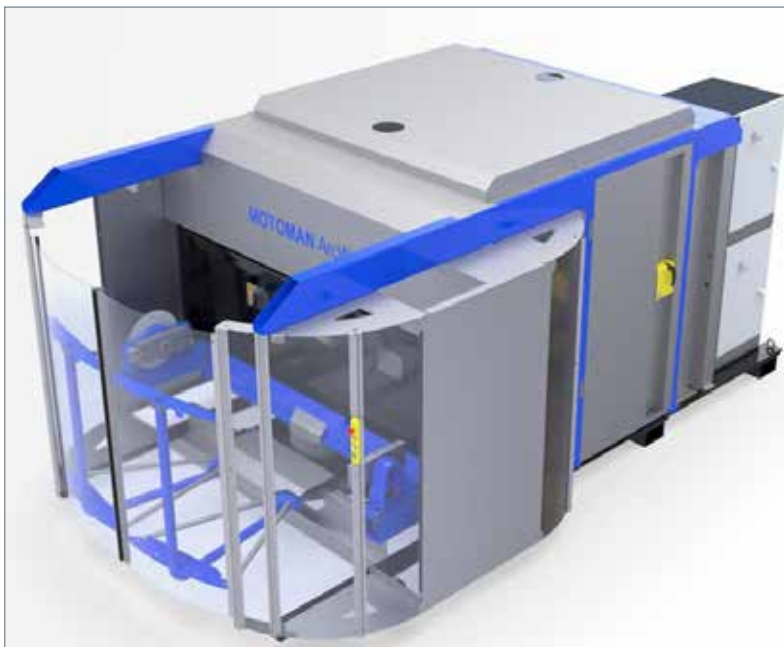
lucrative revenues are largely wasted due to inefficient administration (surprise, surprise), corruption and unscrupulous legal claims.

So what's stopping the introduction of mandatory 3rd party insurance, yearly roadworthy testing and comprehensive and properly conducted driving tests?

Nothing I suggest, except that it will probably put cronies and thieves out of work and result in a loss of votes for the ruling party at the polls.

Eish.

## Robotic welder offers flexibility



AEROKLAS Duys, an automotive manufacturing supplier for Ford in Silverton, the company required something unique for its rear bumper step assembly of the Ford Ranger and the VW Amarok. "At first, the company explored the option of custom-built robot cells for its welding requirements," says Yaskawa's Sean Low. "But after seeing the benefits of our ArcWorld system, they decided that the solution matched their criteria and proceeded to order three systems."

The ArcWorld system is the definition of compact and ready

to use. As Sean explains, the solution is preassembled, pre-programmed through offline 3D CAD models of the jigs, and designed in such a way that it can be easily removed from the container, put on its wheels, and moved to its desired position. As long as there is a flat surface on the factory floor and it is connected to power, the system is ready to be installed and deployed in no time.

### New location

While the solution-in-a-box model is appealing due to its straightfor-

ward nature, ArcWorld holds another two key benefits. The first is how it is completely integrated and modular, allowing for the systems to work together and with the current assembly line. In addition, there are customisation options available. "This robot system can be paired with any welding machine brand," adds Sean. "We understand most automotive OEMs (original equipment manufacturers) like to retain consistency in brands used, so we will pre-install their desired brand of equipment into our solution." Second, the system

is easily movable and leaves a smaller footprint. As many factories restructure assembly lines or even move premises, it is crucial to have solutions that can adapt to the ever-changing surroundings and floorspace. In terms of ArcWorld, it is wheelable so it can be moved to a new position without much effort. All that is necessary here is to unplug, raise the built-in jacks of the cabinet, and wheel it away to a new location.

Because Yaskawa is a global brand, the high-quality cabins are built in Europe to EU standards, so they already come equipped with the required European safety features. What is critical, however, is training of the robot operators on how to maximise the potential of the robots and how to use them safely. For Yaskawa, this has always formed part of its value proposition as it offers training courses to each of its clients. There is also the opportunity for companies to enroll their operators in the Southern African Institute of Welding's ongoing welder course that allows them to receive a certification from the local technical body.

For more information visit: [www.yaskawa.za.com](http://www.yaskawa.za.com)

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# New research shows no end to coal financing in sight

URGEWALD, Reclaim Finance, and 25 other NGO partners have published research on the financiers and investors behind companies on the “Global Coal Exit List” (GCEL). The GCEL Finance Research shows that South African banks and investors continue to finance coal despite the climate crisis and danger to people’s health.

## Top South African lenders to the coal industry

Between January 2019 and November 2021, 10 African commercial banks provided US\$2.807 billion in loans to the coal industry. Five South African banks accounted for 97% of total lending by African banks to companies on the GCEL.

The top five lenders in this ranking are Standard Bank (with a total of US\$ 426 million in loans to the coal industry), FirstRand Bank, Nedbank, Absa Group and Investec Group.

## Top South African underwriters to the coal industry

Between January 2019 and November 2021, these same five South African commercial banks channelled US\$661 million to companies on the Global Coal Exit List through underwriting. Whether banks are supporting the coal industry by providing loans or underwriting

services, both actions lead to the same result: millions of dollars continue to be pumped into an industry that must urgently be phased out if we are to avoid global catastrophe.

## Top South African investors in the coal industry

While banks provide corporate and project finance to the coal industry and underwrite coal companies’ share and bond issuances, the ultimate buyers of these securities are investors. The report also analysed the role of investors in the coal industry in South Africa.

As of November 2021, the research had identified 103 South African institutional investors with combined holdings of over US\$ 9.9 billion in the coal industry with three investors accounting for 67% of this total.

The three largest South African institutional investors in the coal industry are the state-owned Public Investment Corporation (PIC), the Industrial Development Corporation of South Africa (IDC) and Anglo-South African asset manager NinetyOne, with combined share and bond holdings of US\$ 6.6 billion.

Despite the PIC being a signatory to the United Nations Global Compact (UNGC) and the Principles for Responsible Investment (UNPRI), it held a total bond and share holding of US\$ 3.6 bil-

lion in GCEL companies in November 2021.

The PIC recognises its climate risk in its 2021 integrated annual report, but provides no management or mitigation strategy. In September 2021, the PIC put out an invitation to tender for service providers to assist with formulating a climate change strategy, policies, and action plan. To date, the PIC has made no commitments to exit coal.

“There is a tragic irony in the fact that the PIC’s asset base is built on contributions from ordinary working South Africans. These are many of the people who will bear the brunt of climate impacts, both physical and economic. Failure to decarbonise the economy will result in untold costs arising from both physical damage and an economy based on unsustainable fossil fuel derived energy. And in South Africa, decarbonising first and foremost means ditching coal as quickly as possible,” says Centre for Environmental Rights’ attorney Brandon Abdinor.

The IDC, a South African development finance institution, includes “strengthening the green economy” as one of its seven key focus areas for the 2022 financial year, but has a share and bond holding of US\$ 1.5 billion in two GCEL companies, including Australian BHP Group Ltd.

Investment management firm NinetyOne formally pledged its

support for the Task Force on Climate-related Financial Disclosures (TCFD) in September 2018 and continues to report on its exposure to and management of climate risk using the TCFD framework. However, NinetyOne has a total investment of US\$ 1.5 billion in 28 companies reflected on the GCEL.

Centre for Environmental Rights’ attorney Leanne Govindsamy says that, “The fact that South African development finance institutions and an investor like NinetyOne continues to finance the coal industry and at such a massive scale speaks to the real extent of the problem we are facing, as a country and as a people, one of complete disregard for people and the planet. The real impacts of the coal industry are felt by coal affected communities and many investors seem to accept the externalisation of the negative impacts on air, water and soil – ultimately – on people’s health, because it is not

visible to them. The Life After Coal campaign has highlighted time and time again what the true impacts of coal are on affected communities. When will banks and investors pay attention, and will it be too late?”

## Investments in coal developers

For years, the United Nations Framework Convention on Climate Change, the United Nations Environment Programme, the UN Secretary General, and even the International Energy Agency have warned that there can be no more investments in new coal plants and new coal mines. Divesting from companies that are still actively developing new coal plants, new coal mines, or other coal infrastructure should therefore be a priority for a responsible bank or investor.

Unfortunately, this is not the case in South Africa: The GCEL Finance Research identified 45 new thermal

coal mining projects in South Africa - 41 of these are run by South African companies.

Despite net zero promises and climate ambition statements by financial institutions after COP26, the vast majority of investors are still failing to do the obvious: End their investment in coal assets and adopt coal exit policies that are in line with the 1.5°C target.

“It is scientifically well established that Southern Africa is warming at twice the global average. South Africa is already a water scarce country and the Intergovernmental Panel on Climate Change is clear that climate change-induced drought is one of our major risks. We have unprecedented human rights and humanitarian crises in the making,” says Govindsamy.

## Conclusion

The research shows that a small number of financial institutions

play an outsized role in keeping the country’s coal industry afloat.

Five South African banks account for 97% of loans to the industry. Three investors account for 67% of institutional investments in coal assets.

These financial institutions have a crucial role to play in the just transition and must be held to account by civil society, financial regulators, customers and activist shareholders.

For information on all financial institutions covered by the research as well as a detailed methodology, visit: <https://coalexit.org/finance-data>

For further information, contact: Alexis Scholtz-Wheeler, +27 (0)82739868, [ascholtzwheeler@lifeaftercoal.org](mailto:ascholtzwheeler@lifeaftercoal.org) Ognyan Seizov, Urgewald, +49 (0)30 863 2922 61, [ognyan.seizov@urgewald.org](mailto:ognyan.seizov@urgewald.org) YaInn Louvel, Reclaim Finance, +33-688907868, [yann@reclaimfinance.org](mailto:yann@reclaimfinance.org)

## Innovative digital slotting design solutions for warehousing

WAREHOUSING and distribution operations are critical in integrated supply chains. As part of the company’s portfolio of technology innovations, Maersk is exploring AI-empowered, warehouse design slotting digital solutions.

In large scale fulfilment operations, slotting is essential to maximize the overall efficiency of warehouse operations by maximizing space utilization, increasing productivity, and reducing inventory handling. The constant optimization of inventory layout within warehouses improves workflows, order preparation processing times and the company’s operational strategy.

“Utilizing AI, developing algorithms, pre-

dictive analytics, simulations and data-driven analytics added to business model innovations enables us to continuously improve supply chain processes. This visibility enables our customers to compete with a faster time-to-market proposition. AI solutions embedded with deep expertise in machine learning, optimization, simulation, and data-driven analytics also upskills decision-making” says Erez Agmoni, Maersk’s Head of Innovation and Strategic Growth for the Warehousing and Development product.

Since November 2021 in Redlands, California, Maersk’s cross-functional innovation team collaborated with IAI Labs Technology to create a customized

digital application for the slotting solution process in omni-channel fulfilment centres. The new technology being prototyped enables software analysis to improve the accuracy and efficiency of results and enhance the storage location distribution of items for warehouse utilization.

“The solution is well-ahead in the proof-of-concept process and is already tracking with a 97% accuracy rate which will significantly improve decision-making through digitalization” explains Manuel Pappaterra, Maersk’s Warehousing and Distribution, Head of Customer Implementations. More testing and research is planned for phase two of the project in Q1 2022.

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# Fighting back

*Metal manufacturing major, Fabrinox shakes off the effects of the COVID pandemic and the war in Ukraine with proven strategies and an emphasis on greater customer involvement. CEO Andre Visser elaborates to CBN Editor Robin Hayes.*



Andre Visser.

“THERE is no denying that the COVID pandemic has had an impact on our business operations” stated CEO Andre Visser, “SA businesses have not escaped its worldwide effects and we are no different. Pre-pandemic levels showed that about 20% of our turnover was from international business, that has dropped to 10% now, and even been compounded with the war in Ukraine with two of our projects being suspended – one in Ukraine and the other in Belarus. Hopefully for all concerned, this tragic state of affairs will end quickly with a return to normal life.”

Despite the pandemic and lockdowns, the company has recently completed the third phase of a three phase expansion programme involving both premises and processes. Expanding its offering of world

class services of sheet metal and tube fabrication solutions, includes custom tailored project management, global installation, procurement, technical advice along with manufacturing design and documentation, within an ISO 9001, ISO 3834 & EN 15085 environment.

Fabrinox continues to be a South African success story, which over the past 29 years has perfected the supply of components and or sub-assemblies to many OEM's where relationships and trust have been nurtured in some cases over the entire period of Fabrinox existence.

#### When the going gets tough...

“It is often the case where adversity gives rise to new opportunities and we have seen this at Fabrinox, where we have capitalised on close relationships



An example of Fabrinox precision fabrication.

with both local and international clients. Such is the quality of these relationships that our engineering teams have become part of some of our long standing client's R&D departments.

“This of course provides a distinct advantage in the highly competitive sector in which we operate, that has intensified since the onset of the pandemic. In addition to our focus on customer centric approach, this competitiveness has been countered by our flexible manufacturing facilities which allow two-thirds of our manufacturing space to be quickly modified to suit a customer's production requirements with the other third dedicated to heavy machines which by their nature have to be permanently located.

“We are active and competitive across a wide spectrum of industrial sectors

including transportation, food and beverage – a growing market worldwide, health services, renewable energy and recently in the water treatment and fire safety space.

“Our foray into water treatment stems from a partnership with a UK based firm that has conceived a containerised waste treatment system, described as a grease trap waste disposal ‘hub’ that collects and separates the significant portions of oils, fats and grease from food production waste, turning them into clean water and beneficial feedstocks that can ultimately be sold separately and used in the production of biodiesel. Our first pilot plant has been in operation in Amsterdam and our partners are well on their way to securing more sites in the UK. We have plans for our locally manufactured plant to be tested here through an

agreement with a local municipality, and upon successfully completing trials will hopefully lead to another avenue of operations!”

#### Staff welfare to the fore

“In order to innovate, produce and grow, we need a highly talented, well-motivated workforce. We are acutely aware of the effects that lockdown, wearing PPE and continued isolation have had on our staff and measures have been put in place to alleviate potential health problems for all our 151 staff complement and especially for those that travel both locally and now overseas on company business. These measures have now become part of our evolving HR policy which will equip us to facing the challenges of the ‘new normal’ and continuity for the next 30 years or even more” concluded Visser.

## Things that you need to consider when sharing your finances with a partner

WHEN people enter into long-term relationships, they often embrace a ‘what's mine is yours’ approach to sharing their lives with each other. While this type of ‘collaborative’ lifestyle does have its advantages - not least the convenience and cost effectiveness of a single shared bank account, or the ability to purchase a bigger property by pooling your income as co-applicants for a bond, it's important to realise that a shared approach to financial management is not without its risks.

That's according to Johan Strydom, Product Head at FNB Fiduciary, who says that surviving partners who have faced financial challenges and difficult choices on the death of their life partners, highlight the potential risks that couples need to consider when they make the decision to share everything, including their financial resources.

“While sharing all your money matters may have some romantic appeal and might offer financial benefits, it is vital that couples enter into this type of financial relationship with their eyes open to the potential risks it presents,” Strydom says, “the most important, and potentially devastating of which, is what will happen to your bank account or home loan if one partner passes away.”

Strydom highlights the risks associated with partners sharing a bank account as a case in point. If the primary account holder to such an account passes away, the bank is required by law to freeze the account until the estate of the deceased person has been fully processed. “This requirement can be challenging for a surviving spouse or partner,

even if they held separate bank accounts, but it is especially difficult in a joint arrangement,” he says, “because the surviving partner will be unable to access the account, or the money in it, for the full time it takes to wind up the estate.”

And he points out that co-applicants on home loans can face similar problems. “When one of the co-applicants on a bond passes away, it impacts the entire credit agreement with the bank,” he says, “which means that, in terms of the bond arrangement, the total amount owing on the loan will need to be paid back to the bank.”

Strydom says that in any of these scenarios, the financial pressure placed on the surviving partner can be immense if adequate preparations have not been made. While these preparations will differ according to the unique situation of each couple, Strydom says there are some rules of thumb that every financial partnership should adhere to. “If you have a bond, especially a joint one, make sure that both parties have adequate life insurance in place to cover the full amount of the bond,” he urges, “and don't ever be tempted to cancel that life insurance later in life, before the bond is fully paid off. The older you are when a co-applicant dies, the more difficult it will be to refinance the loan or get credit elsewhere to pay it off.”

He also recommends that partners who only use one bank account also consider opening separate bank accounts and ensure that they have access to enough money to cover their essential expenses for a month or two if their partner passes away.

## Diarise: Securex 2022 - 31 May to 02 June 2022

SECUREX South Africa 2022, Africa's security and fire trade exhibition will take place from 31 May to 02 June 2022 at Gallagher Convention Centre in Johannesburg, and will be co-located with three additional Specialised Exhibitions trade shows, namely A-OSH Expo, Facilities Management Expo and – for the first time – the new Fireexpo 2022. Access to the four trade shows is free-of-charge for visitors.

Fixed and mobile assets protection with DigitFMS Securex 2022 Gold Sponsor DigitFMS, a turnkey fixed and mobile assets security solutions-based company, will be showcasing several vehicle

tracking / fleet management solutions at this year's show.

DigitFMS will not only have a number of products on display on stands D15 and E13, the organisation will be presenting live demos as well as a competition, valued at R10 000, where the winner will enjoy a day experience at the track, with the opportunity to drive five sports cars.

HIKMICRO: See the world in a new way. HIKMICRO, an international manufacturer of thermal imaging equipment and reliable solutions for a safer, smarter, and more efficient world and Silver Sponsor at Securex 2022, will feature several of its products on stand A05 this year.

Astra Fasteners As the official distributor of Dirak, Southco and Vispen products in southern Africa Astra Fasteners, a specialist fastener solutions provider in South Africa that provides access, locking, hinge, security fasteners and gas spring solutions to the entire continent, will focus on its range of securing products at this year's Securex exhibition, including wireless access control solutions, tamper-resistant fasteners, and smart lock systems. Astra Fasteners prides itself in quality assurance backed by a ISO 9001 certification and is a level 1 B-BBEE contributor. Visit the company on stand B04 for more information.

Fluss: turning your smartphone into a key for almost any electronic lock Securex 2022 attendees interested in moving towards greater automation either at home or at work, would do well to visit stand D08 for more information on Fluss, a locally developed app for both Android and iOS devices, which can be integrated with a small device connected to your home or business access control system that turns your smartphone into a key to open almost any gate, garage or electronic door lock. Twice daily, Fluss will be giving away devices valued at R1 000 apiece, as well as the company's surprise

‘tech Easter egg hunt’ competition. New distributors signing up at Securex will also qualify for a launch special 25 percent discount on their first month.

Visitor registration for Securex 2022 is open, visit: <https://tickets.ixsa.co.za/event/securex-expo-south-africa-2022> to secure your ticket. Companies interested in exhibiting at Securex South Africa 2022 should contact Zeld Jordaan on tel: +27 (0)11 835-1565 or email: [zeldaj@specialised.com](mailto:zeldaj@specialised.com) Contact information: Specialised Exhibitions, Keraysha Pillay, tel: +27 (0)11 835-1565, [kerayshap@specialised.com](mailto:kerayshap@specialised.com) Nicola Read, +27 (0)83 269 2227, [nicola@pr.co.za](mailto:nicola@pr.co.za), [www.icomm-pr.co.za](http://www.icomm-pr.co.za)

## Appointment



FABRINOX has appointed Janco Barnard to the position of Commercial Manager. This key appointment will

support the company's mission to further establish itself as a market leader in innovative manufacturing solutions.

With a Bachelor's and Master's degree in Engineering, obtained from the University of Stellenbosch, his experience and education extend to business and industrial process development with a strong focus on optimization.



# Afrox plants certified to FSSC 22000 Food Safety Management Standard

Pieter Moolman, Afrox product manager for Packaged Special Gases, discusses the success of a two-year project to certify the Western Cape and Gauteng gas production and filling facilities to the FSSC 22000 Food Safety Management Standard (FSMS).



IN further support of its high-purity range of food-grade gases for use in modified atmosphere packaging (MAP), accelerated ripening, fast chilling/freezing and other food related processing applications, Afrox has now completed a two-year project to certify its Western Cape and Gauteng gas production and filling facilities to meet the FSSC 22000 Food Safety Management Standard (FSMS), which is the comprehensive certification scheme for food safety management that incorporates ISO 22000, ISO 22003 and additional sector specific technical specifications and requirements.

This Afrox certification project began in March 2020, when the world was just entering the anxious and unprecedented COVID-19 period. Following a successful audit on 29 November 2021, Afrox's Kuilsrivier ASU and the Epping filling facility in the Western Cape Province were certified. This was followed in December 2021 by an audit of the Pretoria ASU and the Afrox Gas Operations Centre (GOC) in Germiston, which culminated in

the additional certification of these two facilities in January 2022. These four facilities supply near 90% of Afrox's national demand of food-grade gases.

While Afrox food-grade gases all conform to global food grade regulations and standards, FSSC 22000 certification of the production sites adds another widely recognised international standard for the food industry. "The consequences of unsafe food can be serious," says Afrox's Pieter Moolman. The FSSC 22000 Food Safety Management Standard helps us to identify and control all food safety hazards, providing reassurance to consumers and those responsible for the global food supply chain that all food packaged or processed using Afrox-produced gases complies to the highest safety and quality standards.

"We are particularly proud that our Afrox ASUs and gas filling facilities in the Western Cape and Gauteng are the first Linde Group plants in the world to be certified to this high-level safety management standard," he adds.

The main Afrox gases used in the food industry are nitrogen, oxygen and carbon dioxide, which are all widely used in Modified Atmosphere Packaging (MAP) applications, either alone or in combination with each other.

Afrox's FoodFresh™ range of MAP gases are used with modern packaging materials to extend the shelf-life of fresh foods, while eliminating the need for using artificial additives or freezing tech-

nologies. They enable fresh produce such as fruit, vegetables and meat to be sold to consumers as if they came directly from the food producer.

FoodFresh™ gas mixtures slow down food decay mechanisms. "Carbon dioxide, for example, inhibits its microbial activity that would cause food to decay in air, while nitrogen, an inert gas, is used in packaging to shield fresh food from oxidation-based deterioration," Moolman explains adding, "but oxygen is also added to some FoodFresh™ gas mixtures, particularly for fresh red meat where it preserves the oxygenated form of myoglobin that gives meat its fresh red colour."

"We can supply food grade carbon dioxide (CO<sub>2</sub>), nitrogen (N<sub>2</sub>) and oxygen (O<sub>2</sub>) as individual gases in cylinders as well as liquids in insulated vessels for mixing at food packaging machines," he says.

Ripegas, a mixture of nitrogen and ethylene, is an Afrox's food-grade gas solution used to accelerate the ripening of fruit. "Fresh produce is often harvested while green and stored in ripening rooms. Just before it needs to be shipped, an ethylene-based Ripegas mixture is pumped into the room to accelerate the ripening process," Moolman explains, adding that fruit can go from green to ripe in a few days, enabling delivery to coincide with the fruit's optimum texture, colour and flavour.

A range of carbon dioxide (CO<sub>2</sub>) and nitrogen gases called Suremix for dispensing sodas, draught beers, lagers and wines is

another off-the-shelf Afrox gas mixture that conforms to all major drink manufacturers' specifications.

Afrox's food grade gases manufactured to the FSSC 22000 management standard can also be supplied for fast chilling and freezing of foods or juices using liquid nitrogen (LIN) or liquid carbon dioxide (LIC).

Describing where these gases come from, Moolman says that Afrox nitrogen and oxygen is separated from atmospheric air in Afrox's Air Separation Units (ASUs), while carbon dioxide can be taken from natural wells, captured off fermentation processes; or from the by-products of industrial processes such as ammonia production. These individual gases are then mixed and packaged at one of Afrox's regional gas filling facilities to the specifications of its food processing clients.

Citing the success of these first two Afrox FSSC 22000 FSMS certification projects, Moolman says that this would not have been possible without the commitment and dedication of the project's task team, led by chairman Patrick Mohapi and his deputy, Hamilton Dlungel. "Both Patrick and Hamilton hold management roles within the onsite business area, while other team members: Nomcebo Masuku, Quality Assurance lead; Emile Thelander, SHEQ and sites support representative; and Barteld Botha from Sales and Marketing all made significant contributions to the project's success."

"The sites' management teams: Malibongwe Nkunzi for the Kuilsrivier Plant; Pieter Smith for the Epping site; Mark Njeru for the Pretoria ASU; and Lungiswa Mali were also always ready to lend a hand and were a pleasure to work with," he adds.

"During this project we saw a true spirit collaboration amongst Afrox departments, in keeping with our vision for continuous improvement and adopting best practices," Moolman concludes.

# Transformation, a priority to VWSA



From left: Brandon Naidoo (Quality Assurance), Patrick Moodley (Director), Bala Moodley (Director), Merrilyn Nxasana (Supervisor) and Yogesh Govender (Machine Setter) from Thekwini Wire.

TRANSFORMATION extends to the company's supply chain, with two new black-owned suppliers joining the VWSA supplier base after completing a mentoring programme offered by the company.

KPL Die Casting and Thekwini Wire, both beneficiaries of VWSA's Project Ntinga, began supplying parts for the Polo and Polo Vivo built in Kariega in 2021. Project Ntinga was launched in 2017 to develop black-owned suppliers to the automotive industry through an intensive mentoring and coaching programme. Five winners were originally chosen to participate from a group of over 300 suppliers.

"We were fortunate to be trained by the VWSA team, and we also had an automotive expert appointed as our mentor, who

guided us to become a more valuable supplier within the automotive sector's supply chain," said Bala Moodley, director of Thekwini Wire in Durban. Thekwini Wire, which was opened in 2009, is currently a second-tier supplier, supplying parts to one of VWSA's direct suppliers, who in turn supplies parts for the Polo. "The insight from VWSA production site visits helped us to implement newer ways of working and improved our ability to streamline our processes. We also gained the confidence to approach other automotive manufacturers and Tier 1 suppliers for new work."

Meanwhile, KPL Die Casting has been supplying a part to VWSA for the Polo Vivo. "Through Project Ntinga, KPL gained more capacity to respond to market demands, and learned

the importance of using globally recognised quality business processes," said Sally Marengo, owner and managing director of KPL.

KPL was also assisted during the Covid-19 pandemic by the B-BBEE Initiatives Trust, which was established by VWSA in 2016 with the mandate of driving transformation in the South African automotive industry, by investing in black-owned suppliers and offering post-investment support to these companies.

With transformation being one of the key priorities for VWSA's corporate strategy, the company has continuously worked towards achieving a diverse, inclusive workforce and supply chain. These efforts are evident through the company's recent achievement of a B-BBEE Level 3 status.

# City's Business Hub an invaluable asset to Cape Town entrepreneurs

WITH their business assistance platform and calendar of free training, the City's Business Hub's helpdesk has proven to be an invaluable asset to small businesses in Cape Town.

In the past financial year, the Hub has responded to more than 1 750 enquiries, 1 051 have come in since the beginning of 2022. The helpdesk team answers questions about red tape, tendering and where to find financial assistance. At the same time, 973 entrepreneurs have participated in the skills development programmes offered.

The City government's support for blossoming enterprises has ensured Cape Town's reputation as Africa's start-up capital. According to the latest

Global Financial Centres Index, the Mother City has outpaced several cities across the continent and is homing in on the crown for Africa's top financial centre.

The City is determined to continue providing these necessary resources for Cape Town's small businesses to thrive. As such, a significant portion of the City's budget for Economic Growth is specified for The Business Hub as well as enterprise development programmes with partners such as Productivity SA and the South African Renewable Energy Incubator.

The City's mission is to get us to the number 1 ranking on that index. We remain committed to continuously finding

ways to make life easier for businesses, giving them the freedom to innovate, develop, and employ more people.

To see when the Mobile Hub will be in your area and to sign up for one of the development programmes, visit <https://www.investcapetown.com/news-events/business-events/>. For data-free access to the virtual sessions, attendees can use the SmartCape services in public libraries or go to one of the 100 City-run buildings in the metro with free Wi-Fi access.

To find out more, visit: <https://www.capetown.gov.za/local%20and%20communities/get-online/Public-Wifi-Zones/public-wifi-across-the-city>

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## Boosting SMMEs and driving youth employment - can't have one without the other

By Janine Espin,  
Managing Director  
at Economic  
Development Solutions



IN support of economic recovery and to boost youth employment, the government has proposed R5.2 billion in tax relief while the Department of Small Business Development has announced plans to support at least 15 000 youth-owned enterprises. Although the proof is still in the pudding, this is a step in the right direction given that small businesses are the backbone of the economy and youth unemployment is one of South Africa's biggest and most pressing problems. To ensure that the proposed measures have the desired outcome of small business development and youth employment creation, it is necessary that all stakehold-

ers are involved - from government agencies to private sector players and educational institutions.

### Properly utilising existing resources

Small, Medium and Micro Enterprises (SMMEs) are crucial for the redevelopment of our local economy and these proposed interventions from the government can provide much-needed relief. They however do need to be channelled correctly through existing small business development resources, such as the Small Enterprise Development Agency (SEDA), the Cooperatives Incentives Scheme and the Black Business Supplier Development Programme. From a youth development perspective, the Umsobomvu Youth Fund and the National Youth Service have already been established for the purpose of helping our youth set up, expand and develop their businesses by teaching them essential business skills. Youth Advisory Centres (YACs) have been established

around the country, providing walk-in facilities for youth to receive information, training and referrals. Funding can be facilitated through agencies like Khula Enterprise Finance and the South African Micro-Finance Apex Fund, as they all have their own criteria and processes and service providers to ensure that we achieve the desired trickle-down effect towards beneficiation and job creation.

### Educational foundations

Our economy doesn't need more lawyers or accountants to rebuild. Instead, school learners need to realise that entering a trade or acquiring a critical skill that is in short-age is the best way to ensure employability and to earn a living reliably. For example, every year the government releases its list of critical skills. This is a missed opportunity for youth skills development, as we have the potential right under our noses - all we need to do is identify their potential and develop these critical

skills within our own borders, by creating the necessary educational, training and support structures that help to make the youth employable, while creating employment opportunities through entrepreneurial development.

### Developing on the right idea

While the government has all the right intentions with small business support and youth development, it's going to take a lot of focus and collaboration in order to properly understand what the needs are in this sector. Without this understanding, it's simply throwing money at a problem. By properly defining and appreciating what the entrepreneurial needs are, we can then start to define how entrepreneurs can best be developed to encourage employment, which will in turn have the consequence of creating youth employment opportunities, for which the youth need to be adequately trained, equipped and skilled in order to be employable.

## The shift to e-commerce in South Africa

FOR the past decade, e-commerce (online retailing) in South Africa has gradually been gaining some traction with limited adoption due to consumer fears of parcel theft, online fraud, high mobile data costs and challenges with last-mile delivery. In 2019, South Africa's e-commerce industry was in its infancy stages, accounting for 1.4% of the total retail spending and 8% of total card payments spent in the retail space. In 2020, e-commerce spending grew by 30% while the average brick & mortar (or physical spending) decreased by 12%.

Due to the national lockdown imposed by the government in response to the pandemic, traditional retailers needed to reform their business models to draw their customers in without the enticements of malls.

This accelerated the need for digital innovation, shifting consumer expectations to increased online consumption enabling South Africa to follow global trends. This pushed the pace of change into hyper drive with some business models thriving and others suffering early retirement. By the end of 2020, South Africa saw a 50% - 70% growth in e-commerce, with an increased uptake in online retailing, click-and-collect and video streaming. Furthermore, online spending

on goods and products (other than travel and accommodation) doubled in 2020, reflecting a 102% increase. By 2021, the industry had witnessed an additional 39% growth, with e-commerce accounting for 14% of the total card payment sales.

According to FNB Merchant Services statistics, total online sales increased by 55% in 2020 driven by increased spending in less traditional e-commerce industries. By 2021, online spending had grown by another 42% with robust transaction values reaching 500 million. By 2025 the value of e-commerce transactions is expected to surge by 150% reaching ZAR 225 billion, in response to a shift in consumer behaviours.

The market is estimated to reach ZAR 400 billion by 2025, facilitated by over 1 billion transactions annually. Currently, e-commerce card purchases are at 8% of the total card purchases in South Africa. However, in the next 5 years, this value is expected to grow to 20% with an annual average growth rate of 16%.

Currently, the South African online e-commerce industry is estimated at just under ZAR 200 billion per annum and is continuing to grow rapidly, with companies such as Takealot, Checkers, Pick n Pay and Woolworths adapting to meet new consumer

habits. Clothing, electronics, footwear, household appliances and health products were amongst the most popular categories in South Africa's online market, with groceries having witnessed a 54% increase since 2019. Accordingly, 64% of South African consumers had bought groceries online for the first time and 53% had made their first online purchase from a pharmacy.

The pandemic acquainted South Africans with online shopping, highlighting its convenience while enabling the growth of the e-commerce market. The frequency of online shopping is set to increase; however, the focus of retailers needs to be on creating an omnichannel shopping experience; that provides consumers with a blended shopping experience of in-store and online shopping.

Furthermore, key stakeholders in the market need to innovate and invest to overcome the challenges in the industry as insecurity remains high. Looking ahead, South African businesses that will succeed in the new world will be those that have demonstrated an ability to seamlessly meet new consumer demand preferences, shifting their bricks and mortar services to online while addressing some of the key challenges the industry experiences.

## Ford revs up flood disaster relief efforts



THE catastrophic flooding that claimed more than 440 lives in KwaZulu-Natal, and devastated parts of the province, has brought misery to thousands of people. To help with relief efforts, The Ford Motor Company Fund has provided a \$25 000 (R370 000) disaster relief grant to the aid organisation Gift of the Givers to assist communities worst-hit by the floods.

Neale Hill, President of Ford Motor Company Africa says, "The scale of this disaster has been almost beyond description.

We knew immediately that we had to help the victims, and Gift of the Givers has shown that it's agile and effective in dealing with such tragedies."

Hill explains that the R370 000 grant will be used for much needed humanitarian relief aid to flood stricken communities. The aid, which comprises food parcels, water, mattresses, blankets and care packs, is being distributed to communities displaced and stricken by the devastating deluge of water. Gift of the Givers will, in addition, provide

dozens of food hampers to displaced Ford employees in KwaZulu Natal. Ford is further assisting dealerships in the affected areas directly through grocery vouchers and fresh water - and has provided vehicles to organisations needing mobility to provide relief.

Hill adds, "Immediately when the news of the disaster broke, our employees and those in the broader Ford family were anxious to know how they could help, so we're encouraging them to donate directly to Gift of the

Givers as well. It's a drive that's quickly gained momentum and one of which we're proud."

Hill notes that disaster-management authorities say the full financial and socioeconomic impact of the flooding is still to be fully established: "What we do know is that every ounce of help is needed and that it will take time to rebuild the province and lives of those affected. We're proud to help where we can."

Badr Kazi, director of the Gift of the Givers Foundation says, "The generous donation endowed by Ford is earmarked for much-needed humanitarian relief aid to flood-stricken communities and families in KZN. We thank Ford for their continued support and empathy toward the plight of our most vulnerable."

## Wrist watch made from bio-mass plastics

CASIO Computer Co., Ltd., have announced that the latest addition to the PRO TREK line of outdoor watches will be made with biomass plastics sourced from renewable organic substances.

Produced from regenerable resources, biomass plastics are attracting attention as a material that can help reduce environmental impact by curbing CO2 emissions.

For the first time in any Casio watch, the PRW-61 uses biomass plastics in the case, band, and case back. The environmentally friendly biomass plastics are produced using

materials derived from castor seeds and corn, as well as other raw materials.

Delivering on outdoor utility, the model is equipped with Triple Sensor (digital compass, barometer/altimeter), as well as Multi-Band 6 radio wave reception from six transmission stations around the world, and Tough Solar to provide stable power for these functions and more.

For optimum readability, the design features thick bar indexes to check time, direction, and other indicators at a glance,

as well as slits on the band above and below the dial that serve as guides to quickly read the compass direction indicated by the second hand.

As part of its focus on the Sustainable Goals, Casio is pursuing a number of environmentally friendly initiatives, including a shift from plastic to recycled paper in packaging for the PRW-61. Casio will also contribute to efforts to build a circular economy by expanding its use of sustainable materials in the design of other watch models, as well.

# Diarise: Enlit Africa – 7-9 June 2022 at CTICC

Continued from P1

the expo floor. Conference delegates will also be able to enjoy the networking and site visits that the event has popularised for over two decades. Strict health and safety COVID-19 protocols will be observed.

## Storage and renewable energy

Over the past 12 months, collaborative efforts have resulted in the electrification of over 220 health facilities in nine countries through a \$2.8 million grant initiative that rewarded sustainable business models from private sector off-grid energy companies. This is one of the presentations in which the role of energy storage and renewable energy will be explored.

“In recent years, new distribution models that combine the experiences from over a decade of decentralised energy technology rollout with traditional utility models have emerged, ushering in a new era of utilities” shares Sumaya Mahomed, Country Director, Uganda, Power for All and a speaker at the event.

The flexibility that is offered by off-grid power systems is changing the African landscape – and has really come into its own as a result of the pressures brought on by COVID-19. Over the past 12 months, collaborative efforts have resulted in the electrification of over 220 health facilities in nine countries through a \$2.8 million grant initiative that rewarded sustainable business models from private sector off-grid energy companies. This is one of the presentations in which the role of energy storage and renewable energy will be explored.

While access to energy in Africa is still one of the biggest challenges facing the energy sector, this is changing as attention is focused on a transitioning energy sector.

“In recent years, new distribution models that combine the learnings from over a decade of decentralised energy technology rollout with traditional utility models have emerged, ushering in a new era of utilities: Utilities 2.0.

Integrated energy approaches draw the strengths of both centralised and decentralised technologies into novel business models for faster, lower cost and more reliable service delivery,” shares Sumaya Mahomed, Country Director, Uganda, Power for All and a speaker at the event.

## Welcoming the whole sector ecosystem

Jennifer Anya, operations manager, Husk Power Systems, Nigeria says: “The event is going to be packed with world class energy experts, service and product producers. I am most excited about the possibility of col-

laboration between OEMs and thought leaders to drive energy transition in Africa.

“We are looking forward to welcoming old friends and new to the event,” says Claire Volkwyn, Enlit Africa Head of Content. “The amazing thing about Enlit Africa is that we recognise the role that every-

one across the sector will play in the energy transition and we welcome input and participation from everyone involved in power generation, transmission and distribution.”

## Industry support

Eskom, South Africa’s Department of Min-

eral Resources and Energy and the City of Cape Town have been official hosting partners of the event for many years and 2022 will be no exception. ESI Africa, the continent’s leading news provider for power and energy news, is the official host publication. Enlit Africa is organ-

ised by The Vuka Group a Cape Town-based and multi-award-winning organiser of exhibitions, conferences and digital events across the continent in the infrastructure, energy, mining, mobility, ecommerce and CX sectors. Other well-known

events by The Vuka Group include DRC Mining Week, Africa Mining Forum, Nigeria Mining Week, Smarter Mobility Africa, ECOM and CEM Africa.

For more information, visit: [www.enlit-africa.com/the-event/learn/programme](http://www.enlit-africa.com/the-event/learn/programme)

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## Angola targets 60% electrification by 2025 driven by renewables

By Verner Ayukegba,  
Senior Vice-President  
of the African Energy  
Chamber

THE Angolan government has reiterated its commitment to expanding the share of renewables in the country's energy mix, with targets set to increase the utilization of renewable energy sources to 70% by 2025. The country's energy mix is currently dominated by hydroelectric power (56%) but also includes energy generated from natural gas (12%).

Angola is uniquely positioned to expand the role of its already strong hydropower sector, with estimates that out of the country's 47 large watersheds, only 5% are currently being utilized. But hydropower is not the only renewable energy source that the southern African country is actively pursuing. Several areas in Angola benefit from particularly favourable wind conditions. For example, the wind speeds in the southern and central highlands of Angola are estimated at an average of 4.5 meters per second, which is optimal for the installation of a wide range of wind farms and turbines of various sizes.

Furthermore, the area facing the Atlantic coast also benefits from strong winds and is projected to have the potential to generate more than 3.9 GW of wind energy.

It is worth noting, that Angola's large hydropower as well as renewables potential makes it a top target regarding green hydrogen, which is touted in many regions as a preferred energy source of the future. For this reason, state owned national oil company Sonangol has started exploring the possibility of producing green hydrogen in Angola together with German partners. The German government, as well as the entire European Union (EU), is very interested in diversifying its energy needs away from Russian gas, and hence, is set to intensify collaboration aimed at developing green hydrogen in Angola.

The EU has put in place the Africa-EU Green Energy Initiative which aims to support Angola's decarbonisation efforts as part of the cooperation programme Global Europe 2021-2027. Through the initiative, the EU is mobilizing funding and technical assistance from a variety of international financial organizations such

as the European Investment Bank. The goal of the initiative is to further expand renewable energy infrastructure such as power grids and interconnectors.

However, Europe is not the only potential source of funding for Angola's renewable energy sector. In 2021, solar energy company, Power Africa, in partnership with the African Development Bank (AfDB), reached an agreement with Angola to boost the pace of electrification throughout the country in order to meet rising demand. A number of sectors in the country including telecommunications, manufacturing and mining are eager for reliable access to electricity and to reduce the utilization of fuel-oil fired generators, and institutions such as Power Africa and the AfDB have a role to play.

Additionally, Angola is looking at solar to fulfil domestic demand and drive the transition and international renewable developers are already driving development. Notably, in 2021, American renewable energy developer, Sun Africa, invested \$524 million in Angola for the purpose of building the largest solar photovoltaic project in the country.

## Meeting South Africa's carbon emissions target: first we measure, then we manage

By Eckart Zollner,  
Head of Business  
Development  
at Economic  
Development Solutions

AS the world's 12th largest greenhouse gas emitter, South Africa has indicated that total emissions will begin to decline in 2025 with our Cabinet adopting a lowered greenhouse gas emission target recently. This target is an indication of the country's commitment to decarbonising the economy and is our National Determined Contribution (NDC) to total emissions. The recent announcement of proposed new legislation to introduce a higher carbon tax rate for businesses that fail to reduce emissions will further accelerate efforts.

The target aims to see annual emissions of between 350 and 420 megatons of carbon dioxide equivalent by 2030. Now that the target has been quantified, what do South African corporations have to do in order to meet the carbon emissions target? In addition to exploring greener technology, and reducing energy



consumption, organisations need to find ways to reduce and offset their carbon output to minimise their carbon tax liability. But first, it will be necessary for corporations to gain the ability to measure their carbon footprint before it is possible to take steps to reduce it.

### Carbon offsetting under the Carbon Tax Act

As a signatory to the Paris Accord on climate change, South Africa is required to meet specific emission reduction targets. Our adopted target of between 350 and 420 megatons of carbon dioxide equivalent by 2030 aims to cut emissions by 28% in comparison to its 2015 pledge which capped annual emissions at 614 MtCO<sub>2</sub> and hinges heavily on an aggressive power sector investment plan along with a cleaner transport strategy, energy efficiency programmes and a carbon tax to meet this target.

The gradual implementation of the Carbon Tax Act sees the first phase run from 1 June 2019 to 31 December 2022 and the second phase from 2023 to 2030.

Section 19 (c) of the Carbon Tax Act enables the Minister to issue regulations for the carbon offset tax-free allowance in terms of section 13. This carbon offset tax-free allowance is meant to give enterprises some breathing room in order to pursue cost effective measures. This will help to reduce their emissions and their resultant carbon tax liability by up to 10% of their total greenhouse gas (GHG) emissions by investing in lower car-

bon mitigation projects that reduce emissions outside their taxable activities. Through recent regulation amendments, the government has agreed to a registry of a national offset programme, and the Carbon Offset Administration System now facilitates the listing, transfer and retirement of carbon credits to offset carbon tax liabilities. Starting with the approval of a specific project by the relevant project standard, all offsetting projects must go through the necessary processes required for project registration and credit issuance, measured in accordance with each specific agreed applicable standard.

### Decarbonising our economy

South Africa presently relies on coal for nearly all of its power generation and is in the process of securing finance to help our national power utility Eskom to transition to the use of more renewable energy. Hot on Eskom's heels, Sasol is South Africa's second largest emitter of the greenhouse gases linked to climate change, and the corporation is under increasing pressure from society and investors to shift from its coal-based legacy and lead the way in decarbonising our economy. To this end, Sasol has committed to a 2050 target of net zero emissions target, while tripling its aim for a 30% reduction by 2030 of GHG off a 2017 baseline.

### Leading by example

What lessons can smaller enterprises in other industries draw from Sasol's ambitious target? It's a clear indi-

cation of the urgency of the need to drastically decrease our carbon output if we're to make a difference in averting climate change. While the carbon tax places a price on emissions and intends to encourage cleaner practices across all industries in South Africa, it also makes provision for a number of tax-free allowances. This includes carbon offset programmes that allow companies to reduce their tax liability by putting money into mitigation projects, incentivising carbon mitigation in sectors or activities that are not directly in the scope of carbon tax, including agriculture, forestry and land use, and waste.

### Measure and manage

In order to effectively utilise these allowances and offset programmes, companies will need to be able to measure and manage all activities, in order to track and reduce their tax liability and ultimately their carbon output. Technology has enabled businesses to gain full visibility across their entire value chain, allowing them to easily and accurately calculate tax liability. Carbon tax calculators have revolutionised previously manual processes, making it easier to report accurately on every facet of the corporation's carbon footprint. In addition to handling the reporting obligations involved in carbon tax compliance, technology provides an effective starting point for decarbonisation efforts, making it easier to identify quick wins and highlight problems to be solved, giving businesses a clear road map to follow while working toward net zero emissions.

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# How is Saldanha Bay strategically positioned to become a hydrogen hub?

ONE of the most significant challenges facing large scale adoption of renewable energy boils down to one problem: How can we efficiently store and transport clean energy? Hydrogen provides an answer to both providing incomparable quantities of energy as well as being relatively easy to store and transport. Furthermore, hydrogen can be produced in collaboration with renewable energy almost anywhere globally. It uses one of the planet's most abundant resources (water), and it has the potential to produce zero carbon emissions. By many accounts, hydrogen will be the energy source that drives humanity into the third industrial revolution.

The goal of reducing carbon emissions creates a unique opportunity for African nations to benefit. Fundamentally, Africa is positioned to become the preferred location for green hydrogen exports due to the expansion of renewable energy infrastructure, greater land availability, and easy access to water sources and port facilities. Strategically, the Western Cape is aligned with the increased adoption of renewable energy resources to restrict the negative impact of climate change and improve the competitive advantage of industry against export markets. In support of this strategic objective, MEC David Maynier launched (August 2021) an Energy Resilience Fund to the value of ZAR13 million to qualifying municipalities for research and planning to determine the requirement and potential costs of the renewable energy projects that the government will be developing to build energy security and buffer households and businesses from load shedding in the Western Cape.

Similarly, Boston Consulting Group conducted a green hydrogen market analysis identifying Saldanha Bay as one of three critical locations for substantial hydrogen export.<sup>6</sup> The factors which competitively place Saldanha Bay apart from other coastal regions are the presence of the natural deep-water port, sufficient land and synergies in solving for water security, and close geographic proximity to large scale renewable energy sources such as photovoltaic solar and wind.

There are still challenges, but together we can find a way.

Freshwater is one of the reactants required to produce hydrogen, the increased demand for

freshwater could significantly increase the severity of water stress within the Western Cape region. Often, "crises present us with unique conditions that allow innovators to think and move more freely to create rapid, impactful change." An outcome of "Day Zero"

was the construction of supplementary and larger desalination plants across the Western Cape. Adjacently, technological developments have effectively produced hydrogen from seawater, which could lead to large-scale hydrogen production and desalination. Here we

see that the incremental development of adjacent technologies can holistically improve the water resilience and energy security of the Western Cape.

Overall, the hydrogen industry has the potential to strengthen the relationship between

South African industry and the global market. As a result, this could lead to more investment opportunities from supporting nations – similar to the US\$8.5 billion deal that was announced at COP26. Furthermore, estimations based on low to high hydrogen demand

cases forecast that the hydrogen industry could lead to the development of approximately 14 000 – 30 000 jobs per year.

Hydrogen is an opportunity for Saldanha Bay to become a critical agent in catalysing the movement towards decarbonisation.

*For more granular information on How Saldanha Bay Is Positioned to Become a Hydrogen Hub, follow the link - <https://www.youtube.com/watch?v=8F-Kpp45Y3Q> Information provided by the Saldanha Bay Innovation Campus.*

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# Concrete technology training courses for Cape Town



WITH Covid-19 lockdown restrictions now eased, Cement & Concrete SA's School of Concrete Technology (SCT) plans to visit Cape Town in August to present live tuition for three basic but important training courses in concrete technology.

SCT will on August 1 and 2 present the "SCT10 Introduction to Concrete" course; on August 3, the "SCT12 Mortars, Plasters, Screeds, and Masonry" course; and on August 4, "SCT13 Making Concrete Bricks and Blocks". The venue for all three courses will be the PPC Cement premises in Montague Gardens in Cape Town.

John Roxburgh, senior lecturer at the School of Concrete Technology, says the two-day "Introduction

to Concrete" course is hugely popular and suitable not only for emerging and new building contractors, small or medium-sized enterprises, but also for any newcomer to concrete-related work responsibilities.

"Sales and laboratory staff as well as site employees will greatly benefit from this training which deals with essential elements of concrete operations such as getting the basics right and knowing why certain procedures and practices are required. This is vital background knowledge for anyone planning careers in concrete and concrete-related industries. In fact, even the most junior staff in companies in the cement and concrete sectors should be armed with the knowledge this course

offers," Roxburgh adds.

He says emerging building contractors will also greatly benefit from the course as it covers all essential aspects such as the basics of materials for concrete, batching and mixing of concrete, and the necessary requirements for transporting, placing, compacting, and protecting as well as curing of concrete.

"SCT12 Mortars, Plasters, Screeds, and Masonry", to be staged on August 3, is of particular interest to contractors and companies involved in house building. It was originally developed by SCT to assist National Home Builders' Registration Council (NHBRC) inspectors to interpret and assess the requirements of the NHBRC Home Builder's Manual. South

African builders must enrol new homes with the NHBRC before construction starts to protect housing consumers' rights.

The syllabus for this course includes:

- Factors that affect the strength of concrete;
- The role and selection of cement, sand, stone, and water in the production of concrete;
- Mix proportions for concrete for foundations and floors;
- Floor screeds;
- Properties of mortar and plaster;
- Sand-cement mixes;
- Slump and cube tests for concrete;
- Vital role of proper curing; and
- Concrete and clay masonry: expansion and shrinkage.

Finally, on August 4, the course on offer will be "SCT13 Making concrete bricks and blocks", a half-day session providing a basic understanding of how to manufacture masonry units that could become the cornerstone of a new business enterprise. "The small-scale production of concrete bricks and blocks for masonry is ideal for small businesses. Manufacturing can be carried outdoors, the process is simple, and the equipment required not exorbitantly expensive," Roxburgh adds.

For further information about the Cape Town training courses, contact Rennisha Sewnarain at [sewnarain@cemcon-sa.org.za](mailto:sewnarain@cemcon-sa.org.za) or phone 011 315 0300 or visit [www.cemcon-sa.org.za](http://www.cemcon-sa.org.za).

# News from ECASA



"THE ECA's Highveld office keeps pushing to better its services to members and the public by seeking new avenues of growth," says Anthony Schewitz, Regional Director. "We've added a new convenient way to communicate with our office via WhatsApp, will host a NBCEI informative session coming up in June and another webinar for contractors who are interested in adding solar PV to their service offering." He adds that there are more new initiatives in the pipeline that are focused on helping electrical contractors in their daily business.

## Highveld WhatsApp line

The Highveld office is now also reachable via WhatsApp on our office line (010) 271 0686 and if you need to urgently to contact the office, you can now simply send a message, documentation, or request information.

## NBCEI Information session happening in June

There's a brand-new offering that will cost the attending members nothing but time, which is a NBCEI information session in June, which will give electrical contractors a unique insight into the National Bargaining Council of the Electrical Industry and their legis-

lated main agreement.

As a trial, the sessions will be held on Saturdays to accommodate those who cannot attend during the week due to work commitments.

Book on the link below to reserve your seat to be a part of the live audience or to receive the recordings.

<https://forms.gle/zHiouFtEarzHu6gq7>

## Ongoing SANS 10142-1 Cover to Cover course

We've completed five of the 20 sessions in the SANS 10142-1 Cover to Cover course and we're a quarter of the way through this course, which is exclusive to the ECA. It's not too late to join as recordings of previous sessions are available and you have the option of joining only for the sessions that you're interested in or joining in for the remaining sessions of this journey through SANS 10142-1. This unique course is an in-depth journey that guides you through the standard, and gives clarity on the clauses, their meanings and interpretations, and the various tests.

At only R350 per session for members and R600 per session for non-members, it's an opportunity not to be missed.

Contact the Highveld office for more information or join on this link: <https://forms.gle/>

[QPUeWoeva3V8PMim7](https://youtu.be/6LsZOBtqFGk)

View the recording: Starting a Successful PV Business webinar

On 14 March, the ECA(SA) collaborated in a free webinar hosted by AREP, in which the topics included:

- How to start a new solar business.
- Which standards guide and limit new solar installers.
- Feedback on issues with installations and what can be done to improve installation standards.
- Accreditation and certification for solar installers.
- Building a positive track record with established distributors.
- How could new distributors manage new installers.
- Solar industry statistics from an AREP membership point of view.

For those who missed this webinar, you can catch up via this link to the recording: <https://youtu.be/6LsZOBtqFGk>

Get in touch with the region for information on all our latest offerings by emailing [leola@ecasa.co.za](mailto:leola@ecasa.co.za) or [pjanon@ecasa.co.za](mailto:pjanon@ecasa.co.za) or calling or sending a WhatsApp message to us on (010) 271 0686.

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## Privyseal - New QR code (Real-Time Certificate of Membership)

THE Privyseal real-time delivery system now offers a QR Code. The QR Code, SAIMEchE Certificate of Membership and linked Privyseal are available to members without the need to register with Privyseal. As long as you are in good standing with SAIMEchE, your QR Code, Certificate of Membership and Privyseal will be

available directly via unique URLs. A separate QR code is also displayed on both seal and certificate, making it easier to share.

Your Privyseal, QR Code and Certificate are available via unique URLs on your SAIMEchE website profile, under the Profile Home / My Profile menu, then go to the Bio tab. The URLs are shown in 4 fields

in the personal information section: Privyseal; Membership certificate; Membership certificate PDF; QR Code.

If your Privyseal or certificate does not display properly with the current date and time, then email our Membership office, as the problem will most likely be with your membership standing.

# Clear goals and guileless partners key to effective management of plastic waste

THE most important consideration for restaurants, hotels, catering companies and others in the HORECA sector seeking to manage their plastic waste is to choose their partners wisely and critically evaluate their claims – especially when they appear to be offering a ‘silver bullet’ as a solution.

This is the message from South African National Bottled Water Association (SANBWA) CEO, Charlotte Metcalf, who asserts that those in charge of programmes to minimise their companies’ or employers’ plastic waste need to adopt an ‘eyes wide open’ approach.

“They should not be swayed by any one claim when it comes to the carbon footprint, the water footprint or the disposal of solid waste and packaging of any product, particularly when the key objective of the latter is to keep used packaging out of landfill,” she said.

“Critically, alternative packaging solutions being offered in developed nations – such as biodegradable and compostable packaging, carton containers, 100% plant-based packaging, collection and re-filling off-site, and on-site re-filling – must be scrutinised because they may not be suited to local conditions.

“In the worst-case scenario, they could disrupt the very successful recycling streams South Africa already has if their collection, treatment and disposal is not meticulously managed by HORECA staff, management and owners.”

Metcalf stressed that the HORECA sector has two major responsibilities when it comes to managing packaging waste.

The first is to help their customers make better choices. One of the main findings of a recent WWF/SA Plastics Pack Secretariat on Consumer Perceptions & Purchasing Behaviour Toward Circular Plastic Packaging report was that “There is strong consumer-based evidence to show that brand owners and retailers influence consumer behaviour around circular plastics.”

For retailers, read ‘restauranters’ or ‘hoteliers’ she said.

The same report concluded that “Although many (consumers) try to make changes, they also delude themselves in an attempt to assuage their guilt, and exaggerate as well as over claim their positive plastic behaviours in order to make themselves feel less guilty. The need to feel as if they are doing the right thing makes them very susceptible to greenwashing as they clutch onto any pro-environmental messaging.”

In other words, Metcalf summarised, retailers, restaurateurs and hoteliers must do the due diligence and critical thinking for their customers, and offer them products that are most suited to the South African environment.

“A responsible and considered choice by the retailer or restaurateur will influence the consumer to follow suit,” she argued.

“It is so important for establishments to have a realistic and balanced environmental strategy with sustainable goals. This strategy should not seek a silver bullet solution in one area at the cost of much bigger considerations and

efforts elsewhere.

“Instead, solutions such as biodegradable, compostable, plant-based, collection and re-fill and on-site re-fill need to be evaluated in depth by procurement teams in conjunction with food safety and other legislation the sector needs to comply with,” Metcalf said.

For bottled water this translates to:

- What is the source of the water, does it ensure purity at source, source sustainability and what are the risks? Is the source licensed and monitored?
- Does the facility guarantee hygienic design, control of operations and are treatments suitable to ensure food safety?
- Do they measure and set goals for the facility’s water usage, solid waste reduction and energy efficiency?
- Is the company registered as a producer of waste and contribute to the recycling levy as required by the mandatory Extended Producer

Responsibility under Section 18 of the National Environmental Management Waste Act? You can find all producers and PROs using the search function in this link <http://sawic.environment.gov.za/epr/search.php>

- Is the product legally compliant?
- Is the packaging designed to be 100% recyclable?

“SANBWA members’ products tick all the boxes and provide peace of mind based on audited conformance,” stressed Metcalf.

“Further, SANBWA requires all its members to actively encourage recycling, to participate in recycling initiatives in the neighbourhoods around their production facilities and elsewhere, and to follow PETCO’s Design for Recyclability guidelines when it comes to their packaging.

“Finally, studies show that PET currently is the best choice for beverage packaging as alternatives to plastics can cost the environment much more.”

# Diarise - PIPES XIII - 6 & 7 September 2022

Emperors Palace Convention Centre, 64 Jones Road, Kempton Park, Johannesburg



SAPPMA – SA Plastic Pipe Manufacturers Association – will present PIPES XIII in conjunction with the Plastic Pipe Conference Association (PPCA) on 6 & 7 September 2022. PPCA hosts the biggest international pipe conference every second year in either Europe or the USA. Its spin-off conference, which is organised every alternate year, is coming to South Africa this year.

The conference programme will include at least 10 of the best papers from PIPES XX which was held in Amsterdam in 2021, in addition to our usual line-up of national and international speakers. The event has been extended to two days to provide for an outstanding offering to our industry.

### Call for papers

If you would like to present a paper at this event, please submit your contact details, proposed topic and a short abstract by no later than 4 May 2022.

**Presentation:** 25 minute presentation; 5 minute Q&A

**Content:** Strictly non-commercial, relevant to the plastic pipe industry and in accordance with a session theme, as listed below:

### Conference Theme: The Versatility of Plastic Pipe

### Session Topics:

- Pipeline Design
- Installation
- Standards, Quality, Testing, Certification
- Extrusion tech-

### nology

- Water problems in Southern Africa
- Infrastructure
- Raw materials
- Rehabilitation of old pipelines.

Other topic may be included and should be submitted for consideration.

### CPD Points apply.

You will receive notice of acceptance/rejection of your abstract shortly after the deadline. The programme will be published by the end of April

For further information contact: Enrike Albasini, Conference Organiser, Email: [admin@sappma.co.za](mailto:admin@sappma.co.za) website: [www.sappma.co.za](http://www.sappma.co.za) - [www.emperorspalace.com](http://www.emperorspalace.com)



## PIPES XIII CONFERENCE

*The versatility of plastic pipe*

Proudly brought to you by the Southern African Plastic Pipe Manufacturers Association, in collaboration with the Plastic Pipe Conference Association (PPCA).

This year's international speaker line-up will include at least ten of the best papers that were presented at the PPCA's PIPES XX conference in Amsterdam last year, along with local experts in all aspects relating to plastic pipe, including:

- Pipeline design
- Installation
- Standards, testing and certification
- Extrusion technology
- Water problems in Southern Africa
- Infrastructure
- Raw materials
- Rehabilitation of old pipelines

### REGISTRATION FEE:

- R4 300 or 300 Euro (excluding VAT)
- R3 400 SAPPMA members (excluding VAT)
- R3 000 for 5 or more in group (excluding VAT)
- R2 200 virtual attendance (excluding VAT)

### EXHIBITION STAND (3M X 3M):

- R8 000 (excluding VAT)
- Includes 1x registered delegate

THE FINAL PROGRAMME WILL BE RELEASED AT THE END OF APRIL 2022.

**6 – 7 SEPTEMBER 2022**  
**EMPERORS PALACE, GAUTENG**

“A high quality conference with excellent networking opportunities” - Chemsystems

“A great platform for learning and interacting with my South African and international peers” - Safripol

“I will definitely attend SAPPMA's PIPES conferences in future. I highly recommend it to anyone! I really enjoyed the last two days and learned a lot” - Alprene Plastic Products



For more information or to register for PIPES XIII, visit the Events Page on [www.sappma.co.za](http://www.sappma.co.za) Alternatively contact conference organiser Enrike Albasini via email at [admin@sappma.co.za](mailto:admin@sappma.co.za) or call (+27) 11 314-4021



# Certification provides assurance and is more than a test report

*CBN published an article entitled "Product Self-Compliance, a challenge to the regulatory process? on p17 of its April 2022 edition which may have caused some confusion. Here the SABS provides a clearer explanation of its testing and certification functions.*

THE South African Bureau of Standards (SABS) conducts a range of tests against South African National Standards (SANS), as well as customer specific requirements and/or testing against compulsory specifications that may be issued for certain product categories.

The SABS offers certification schemes for both products and/or systems that comply with the SANS or a relevant Mark scheme/systems scheme, such as the Scheme for Food Safety Management Systems (FSSC). Additionally, many products undergo more frequent testing and conformity assessments to earn their status which allows them to use the 'SABS Approved' mark on their product.

The SABS' testing and certification services are offered independently, meaning that the SABS attains and maintains an accreditation status in order

to offer the testing and certification services. In some cases, where the SABS uses third party laboratories – the laboratories need to meet stringent requirements and are subject to assessments and inspection by the SABS.

"The SABS is aware that there are numerous manufacturers in possession of SABS test reports which they use as evidence that their products are 'SABS Approved' and it is important for consumers to understand that 'SABS Approved' can only be claimed by a manufacturer if the products was actually certified by the SABS. The SABS laboratory test report is a report of the performance of that product against requirements of a standard or other client specific requirements, and this does not indicate that the product is 'SABS Approved' in any way. A SABS permit to apply the Certification Mark

is a more comprehensive statement of quality assurance of the product or system," says Jodi Scholtz, Lead Administrator of the SABS.

Testing is just one of the requirements in the complete SABS certification process.

## Beyond testing

The testing of products and systems is essential to determine whether performance meets specified requirements of the standard and this is done in controlled and simulated environments. Test reports provide information about a product at the time of testing and are limited to the very sample tested. Test reports do not imply that all the same/ similar products also comply or would pass the testing requirements.

Conformity assessment testing assists manufacturers during their product development phases to ensure

that relevant modifications or enhancements can be made to meet specified criteria as well as to boost the quality of the product. Retailers and consumers are more likely to sell and buy goods and services that have been tested and have successfully passed testing to SANS or specific requirements.

## Why testing doesn't provide the same assurance as certification?

There are a number of reasons for this and include:

- A golden sample scenario, wherein a manufacturer produces a high-quality product with the intent of passing required testing and once a test report is obtained then produces inferior products or changes the ingredients of the product in order to make the products cheaper to manu-

facture

- Poor manufacturing conditions, while a product may be successfully tested for performance it can be produced in unhygienic conditions that may result in contamination of products or the ingredients used. There is also no assurance that the quality of future products will be the same as that of the sample submitted for testing.
- Partial testing, especially with large products/equipment. It is not feasible to subject large products or products that are customised to full performance testing such as mining equipment, cars or transformers or in instances where the manufacturer is developing a product and is interested in a specific parameter they would normally approach the

SABS laboratories for testing of only the parameters of interest.

- Insufficient testing such as with fast moving consumer goods, where several batches of products are manufactured. Given the nature of the industry, once-off testing is insufficient to provide the relevant assurance that all the products in the batch or subsequent batches are made to the same quality as the samples that successfully passed a test.

"A SABS test report reflects the results of specific conditions for a particular sample only and it is irresponsible for a manufacturer to claim that a SABS test report is an endorsement of the quality of the product. In cases where retailers only require test reports in order to sell products, this is usually accompa-

nied by frequent testing and surveillance requests. Testing is required, however certification of products and management systems is a more reliable and comprehensive measure of quality," explains Scholtz.

## SABS recommends certification

"The SABS Mark Scheme, commonly referred to as 'SABS Approved', is a certification scheme that provides confidence in the quality of the products and the production processes to manufacture the product. Samples are collected from a production facility and retail outlets (where relevant), over different periods in a three year cycle by the SABS to ensure that quality products are produced all the time. Samples are collected indepen-

Continued on P17

## WHO ENDORSES YOUR PRECAST CONCRETE PRODUCT?

Being the preferred industry association for precast concrete manufacturers, and in its 49th year of existence, the Concrete Manufacturers Association (CMA) will continue with its primary tasks of promoting the use of precast concrete and driving quality standards with the aim to deliver precast concrete, as preferred construction material, to the industry with consistency in quality.

Thanks to the support and loyalty of its members, the CMA is operating on a stable platform and will continue to do so and improve on the benefits which are offered to all its members.

CMA Producer Members are manufacturers of precast concrete whom pledged their commitment to the manufacture and supply of quality precast concrete to the industry. The BIGGEST benefit of association membership is the image which this member affiliation portrays to the market being serviced. Association Membership is synonym with quality, honesty, professionalism and proper code in conduct!

The CMA yearly embarks on the number of activities including general meetings, industry exhibition representation, workshops and the dissemination of brochures, literature and publications to the advantage of its members and the built environment.

Covid had effect and during 2020 and 2021 the organisation had to rethink and restructure communication and the effective delivery of content to the market. The CMA established a very strong social media marketing platform during this time. The resulting effect was that the communication base of the CMA, with regards to the promotion of the use of precast concrete, grew as never see before. The CMA will continue with these activities during 2022 and the years to come.

The association is proud to announce that its product certification initiative called CMA Certification Services is growing in leaps and bounds. The market embraced the fact that there is a second SANAS Accredited Certification Body available in the South African market which can be utilised. CMA Certification Services (CMACS) offers precast concrete product certification according to SANS specification at high levels of efficiency, fast turnaround times and cost effectively.

Recently the company extended its scope and is now also accredited to certify quality management systems to comply to the requirements of ISO 9000/9001. All this in the effort to ensure its members can maintain satisfactory quality levels in product supplied to the industry and making sure architects, engineers, specifiers, developers and contractors have confidence in use precast concrete units manufactures by CMA Producer members.

The CMA strongly maintain the believe in collaboration with fellow industry associations and organisations. Combined effort to maintain high levels of career development and skills development contributes to economic growth and market stability. Hence the CMA endorses, urges and recommend industry professionals, developers and contractors to consult with, and join the associations applicable to their specific market segments. For the love of concrete - unity creates strength!



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Quality cast in concrete



## Female retention and leadership in engineering

THE Engineering Council of South Africa's (ECSA) Acting President Refilwe Buthelezi Pr Eng, recently addressed the Women and Leadership Conference under the theme "Develop, Unite and Empower", held at Outbaai Hotel in George. She highlighted the challenges that hinder the retention of female engineers and proposed opportunities to circumvent the challenges.

Speaking at the Conference that boasted female representation from the engineering, mining and infrastructure industries, Ms Buthelezi said, "Female engineers form a small but integral part of the South African and global engineering fraternity. The resultant

gender disparity in all technical professions present a significant challenge to females in the sector, as well as to governments, corporates and higher education institutions, particularly because jobs in the engineering, infrastructure as well as mining industries are central to innovation and economic growth", added Ms Buthelezi.

In highlighting the key challenges that hinder the retention of female engineers, Ms Buthelezi noted gender discrimination, work-life balance, and a lack of support by the organisation. Furthermore, the conservative nature of the current engineering sector in South Africa allows little room for diversity and innovation and the limited

access to information restricts well-informed decision making by female engineers.

Despite all the efforts encouraging women to study engineering, over 40% of highly skilled females who enter the field end up leaving.

To address these challenges Ms Buthelezi emphasised the importance of not only attracting female talent, but also to be able to develop, engage progress and retain female talent once inside the organisation. To this, she proposed organisations needing to leverage several valuable resources by creating an atmosphere that is conducive.

This includes; increasing diversity and inclusion across engineering, training and

developing females, affording females opportunities to advance their careers and assisting them to lead a balanced work and life.

In her conclusion, Ms Buthelezi accentuated that "If the future of engineering aims to be more gender equitable, the attraction, education and retention of technical women must be understood and addressed effectively". The two day conference under the theme "Develop, Unite and Empower" included speakers from the Department of Transport and Public Works, Green Building Council of South Africa, PM Aviation, SMEC South Africa as well as Women in Science and Engineering in Africa.

## Certification provides assurance and is more than a test report

Continued from P16

dently and unscheduled inspections at facilities are done to add to the assurance of quality products being produced," says Scholtz.

Clients need to specifically apply for certification at the SABS. Should a client be successful in obtaining a permit to apply the 'SABS Approved' trademark to their products, the assessment of the production facilities will be done in accordance to the requirements of SANS/ISO 9001: quality management systems.

In cases where products are considered high risk, for example where raw materials used in the production process are unstable or where there is a high consumer danger, the SABS works with the customer and regulatory authorities to impose and implement additional consumer safety measures such as:

- Batch testing of

every batch of products such as, condoms;

- Unannounced inspection services, such as in hazardous waste disposal, number plate manufacturing;
- Additional certification of management systems such as SANS/ISO 14001 - Environmental Management System certification to ensure that all environmental aspects and impacts are being identified and managed; SANS/ISO 9001 to ensure quality management throughout the operations and SANS/ISO 45001 - Occupational Health and Safety Management System (OHS) certification, where all related hazards and risks shall be identified to improve the occupational health & safety of

all persons affected by the company's activities.

- The development of industry proficiency schemes to enable the proactive management of quality related issues. For example, SABS spearheads a cement proficiency scheme in which the test results of the various cement products are discussed by the industry which includes clients, regulators, consumer associations and industry bodies.

### SABS is the partner of choice

For all clients that are looking to test their product or to have their products or systems certified, they should consult the SABS. Firstly, as the custodian for the development and maintenance of all South African National Stan-

dards, it is the logical place to start in order to conduct a self-assessment for quality requirements.

Should products and/or the implementation of systems be at an advanced level, the SABS is able to offer quotations for independent assessments and for consideration for certification.

"For seven decades, the SABS has been working with industries, regulators, consumer bodies, academics, manufacturers and consumers themselves to develop standards and to develop certification schemes that improve the overall quality of life for all communities. 'SABS Approved' is a trusted brand and the SABS is committed to ensure that only deserving clients have the privilege and permit to apply the SABS certification Mark," concludes Scholtz.

## SAVA: Bringing together the entire vinyls value chain under one body

THE South African Vinyls Association (SAVA) is the voluntary industry association representing the entire value chain of the local PVC industry. With the help of its members, SAVA is creating a dynamic, sustainable and responsible vinyls industry in the sub-Saharan region. With a mandate to grow and protect the industry, SAVA is pro-actively working to expand key markets, identify barriers to growth and stimulate innovation.

Polyvinyl chloride (mostly referred to as PVC or vinyl) is the third-most produced plastic in the world. Although it is often referred to as "the building plastic" owing to the fact that it is used to manufacture products that have long lifespans (20 to 50 years or more), such as water pipes and plumbing accessories, floors, window and door profiles, it is also used in a wide range of different uses and applications, such as sports equipment, furniture, life-saving medical devices, shoes and fashion accessories and packaging.

Only 1 000 tons (or 2 %) of the locally consumed PVC goes into packaging such as bottles, thermoformed punnets, blister packs, clingfilm and other flexible packaging. Although a small volume polymer packaging material, it is important to note that it has very specific and necessary application values. All of these vinyl products are recyclable, in high demand by recyclers and help to reduce the amount of energy and raw materials needed to produce new products.

The past two years has seen the global PVC supply badly impacted by the pandemic, lockdown measures, hurricanes and other natural disasters in the Northern hemisphere, as well as other domestic and



international events. This has resulted in low production of chlorine, raw material shortages and PVC prices reaching a 35 year high. On the flip side, it has also helped to drive the demand for recycle, improve the industry's cradle-to-cradle infrastructure and developed a true circular economy.

Since its inception in 2011, SAVA has been working tirelessly to assist its members, relevant authorities and experts to understand, characterize and address issues associated with the life cycle of vinyl products through its Product Stewardship Commitment (PSC) - which also forms the cornerstone of SAVA's focus and activities. The Product Stewardship Commitment is based on international health and safety standards and best practice models. It specifies requirements with regards to sustainable manufacturing processes, the sustainable use of additives, sustainability awareness and a closed loop management system. SAVA members are obliged to adhere to these guidelines as a means to improving the reputation and health

and safety credentials of the industry.

In difficult times like the COVID-19 crisis, membership of a professional body is especially important as it offers members a platform to connect, to discuss challenges and share knowledge and learnings, as well as crucial support, stability and a sense of community through the uncertainty. SAVA will be hosting its Annual General Meeting on the Thursday, 12 May 2022 at from 13:00 - 15:00. It is inviting all industry role-players who are not yet members of SAVA, to attend this virtual meeting in order to find out more about SAVA's activities and how it is positively impacting the industry. Details about its new membership structure, fees, global partnerships and benefits afforded to members will also be explained. Guest speaker will be Domenic De Caria, Vice President of Regulatory & Technical Affairs at the Vinyl Institute in Washington DC.

For more information on SAVA or to register to attend its AGM, please email [Admin@savinyls.co.za](mailto:Admin@savinyls.co.za) or visit [www.savinyls.co.za](http://www.savinyls.co.za)



The representative body for the Southern African PVC (vinyls) industry

[www.savinyls.co.za](http://www.savinyls.co.za)



# Hard wearing floor sealants

## Hybriflex-540 The expansion joint sealant

Hybriflex-540 has excellent adhesion to multiple substrates as well as superior movement capabilities. It is highly resistant to UV degradation ideal for expansion joints - both internally and externally. Hybriflex-540 is paintable and low in VOC.

Available in:



## High Tack One adhesive for multiple applications

The original - permanent instant grip adhesive capable of holding weights of up to 25kg with no mechanical fixings.

For panels, skirting boards, windowsills, stone, thresholds, bathroom fittings and metal connecting joints. Low in VOC.



## Den Braven Sealants Do it right the first time

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CONCRETE, traditionally used for warehouse and factory flooring, has become a flooring trend. When concrete is used for flooring it is important to remember that it expands and contracts, due to changes in thermal conditions, and expansion joints must be catered for.

An expansion joint with a polyurethane sealant, such as Den Braven Hybriflex-540, a one-component moisture curing sealant, will reduce cracking between slabs. Important guidelines and equations for expansion joints are available on the Den Braven website:

[www.denbraven.com/en-sa/knowledge-base/joint-dimensions-and-constructions-7/](http://www.denbraven.com/en-sa/knowledge-base/joint-dimensions-and-constructions-7/)

Hybriflex-540 is typi-

cally used with polyethylene backing cord or rod as a bond breaker in concrete joints to create the right joint dimensions for the sealant to be applied, and to avoid three-sided adhesion.

### Why Hybriflex-540?

- It is perfect for both indoor and outdoor use.
- Adheres without primer on most, even damp, surfaces.
- Has good UV retention and weathering.
- Offers high tear resistance.
- Has excellent movement capability, up to 25%.
- It is environmentally friendly with low VOCs.
- Chemical resistant to most chemicals.



*Demonstration using Hybriflex-540 with a backing cord for a three sided expansion joint and gap filling in brickwork.*

- Available in white, grey and black.

Other areas Hybriflex-540 can be used on are walkways and pavements, sealing con-

crete barriers and culverts. In addition it can be used on floor tiles, laminate and composite flooring, skirtings and kick plates. When it comes to fill-

ing, sealing and joining laminates, parquet, cork and wooden floors Den Braven Woodflex is ideal. It can be sanded and painted and is available in six different wood colours.

### Securing handrailings

Den Braven Fix-O-Chem is perfect for fixing balustrades, safety barriers, banisters and hinges. It can also be used for fixing down dynamic machinery in factories, base plates and a multitude of other applications into masonry, concrete, rock and stone.

Fix-O-Chem is immediately ready for use with a high bond strength. It has good thermal and mechanical properties with extremely low shrinkage (due to hardening) and is suitable for

indoor and outdoor use. It can be used for vertical and horizontal fixing applications and instead of plugs or expansion anchors to offer longer lasting secure fixings. Unlike expansion anchors, it does not have any pressure build up on the edge of substrates.

Fix-O-Chem has a self-mix nozzle for convenience and is applied with a standard cartridge applicator.

*The technically savvy Den Braven sales teams, based in Johannesburg, Durban and Cape Town, will gladly discuss and advise on the technical aspects and requirements of a project. Tel: +27 11 792 3830 Email: sales@denbraven.co.za Website: www.denbraven.com/en-sa*

## Nano-engineered sealer leads to more durable concrete

By Washington State University

A nanomaterials-engineered penetrating sealer developed by Washington State University researchers is able to better protect concrete from moisture and salt—the two most damaging factors in crumbling concrete infrastructure in northern states.

The novel sealer showed a 75% improvement in repelling water and a 44% improvement in reducing salt damage in laboratory studies compared to a commercial sealer. The work could provide an additional way to address the challenge of aging bridges and pavements in the U.S.

“We focused on one of the main culprits that compromises the integrity and durability of concrete, which is moisture,” said Xianming Shi, professor in the Department of Civil

and Environmental Engineering who led the work. “If you can keep concrete dry, the vast majority of durability problems would go away.”

Shi and graduate student Zhipeng Li recently published their work in the Journal of Materials in Civil Engineering and have applied for a provisional patent.

Much of the nation's critical infrastructure, such as the U.S. highway system, was built from the 1950s to the 1970s and is now reaching the end of the lifetime for which it was designed. Every four years since the late 1990s, the American Society of Civil Engineers has provided a report card of U.S. infrastructure that shows consistently poor or failing grades. About 8% of approximately 600 000 bridges in the U.S. are considered structurally deficient, and one out of every five miles of highway

pavement is in poor condition. The problem is exacerbated in cold climates by multiple freeze and thaw cycles and by the increased use of deicer salts in recent decades, which can degrade the concrete.

“Concrete, even though it seems like solid rock, is basically a sponge when you look at it under a microscope,” Shi said. “It’s a highly porous, non-homogeneous composite material.”

Topical sealers have emerged as one tool to protect concrete, and many state departments of transportation use them to protect bridge decks in particular, which seem to suffer the worst from salt damage. The sealers on the market provide some level of protection, but moisture is often able to make its way into the concrete, Shi said.

In their study, the researchers added two nanomaterials,

graphene oxide and montmorillonite nanoclay, to a commercial silicate-based sealer. The nanomaterials densified the microstructure of the concrete, making it more difficult for liquid water to penetrate. They also formed a barrier against the intrusion of water vapor and other gases that tend to make their way into the concrete. The nanomaterial also protected the concrete from the physical and chemical attacks of deicing salts. The penetrating sealer is designed to be multi-functional, as it can also serve as a curing aid for fresh concrete.

The WSU sealer is water-based instead of using any organic solvent, which means it's more environmentally friendly and safer for workers, Shi added. “Traditionally, when you switch from an organic solvent to water, you sacrifice the sealers perfor-



*Comparison of a concrete sample coated with nano-modified sealer (left) versus untreated concrete (right). Credit: WSU.*

mance,” he said. “We demonstrated that the use of nanomaterials mitigates that reduction in performance. Researchers have done preliminary market analysis with industry stakeholders and are studying ways to further optimize the sealers.” They are investigating how the nanomaterials-based sealers might

help protect concrete from microbial damage or abrasion, the daily wear and tear that damages the material in high-traffic areas. They plan to conduct pilot-scale demonstrations in the next two years, deploying an experiment of concrete infrastructure on the WSU campus or in the city of Pullman.

## Benefits of commercial carpet

### Ease of Installation and Repair

THE first benefit is the ease of installation. Probably what comes to mind when we think of commercial carpet is a tough low-profile product that does not stand out because it is strictly business. Commercial carpet comes on rolls or in carpet tiles. The tiles are practical because when the business must move furniture, cubicles, or interior walls around it is easier to patch in carpet tiles than to roll out the carpet in the whole room.

### Long Lifespan

The second benefit is durability. Certain manufacturers offer lifetime stain and colour protection because of improvements in the manufacturing process. Many carpet products today are made of nylon fibres that are designed to reduce soiling and retain colour. At the same time, the engineers improved the backing to make the carpet lighter and stronger.

### Sustainability and Health

The third benefit is sus-

tainability and health. Carpet manufacturers are working hard to preserve the environment by reclaiming and recycling their products when it is time to replace the old with a fresh new design. One US manufacturer, Shaw, has reclaimed and recycled approximately 450 000 tons of post-consumer carpet. That's a lot of space saved in the landfill! Closer to work, in the office commercial carpet, today is a healthier product because new processes are improving air quality. Indoor air quality standards contribute to our well-

being. Shaw EcoWorx® carpet meets indoor air quality standards for low-emitting products.

### Design Options

The fourth benefit is the broad spectrum of interior design options. An office can be given any look that you desire without having to give up the first three benefits. Do you want to create a space that inspires lively interaction, or a calm sanctuary for hard work? If budget is the primary consideration, there are basic and luxury options. There



*Classy office flooring. Credit: ShawContract.*

are many ways to combine flooring to define the look of your office. Carpet tiles can be laid in different patterns to

accent spaces where needed.

*Article credit: www.saddlebackcarpet.com*

## Local manufacturer offers construction range



LOCAL producer Pratley has a range of construction and adhesive products that helps deliver the highest possible performance for any project.

The ideal solution for preparing surfaces prior to plastering, painting, or tiling is Pratley Plaster-Grip Primer®. Its ability to prepare almost any surface makes it possible to plaster smooth steel, smooth concrete and even glass! Plaster Grip Primer® is available in one, five or ten-litre buckets.

“Pratley Plaster-Grip Primer® saves on paint by bonding and sealing porous surfaces prior to painting, forgoing the usual three-coat method,” highlights Pratley Marketing

Director Eldon Kruger. It facilitates painting directly onto old lime or whitewash surfaces, in addition to painting galvanised iron.

Pratley Plaster-Grip Primer® is ideal for use with Pratliperl® ultra-lightweight fireproof plaster. Pratliperl® is an ultra-lightweight, thermally insulating, and fireproof aggregate mixed with ordinary cement to produce thermally insulating plasters and screeds.

It is derived from a volcanic glass called Perlite. The raw material is then expanded in special furnaces to create millions of small, well-sealed Pratliperl® beads. Each bead has a small vacuum inside, giving the product

its unique thermal insulation properties. In addition, the product is highly durable and features good acoustic properties. It can even be gunited when applied to large surfaces.

Applications range from underfloor insulation and insulated roof decks to lightweight screeds on corrugated iron or concrete roofs, fireproofing structural steel columns, loose-fill thermal insulation in wall cavities, and even as a lightweight tile adhesive filler.

Another product from Pratley is Flexiseal®, a superior quality, permanently flexible acrylic sealant and filler that has exceptional adhesive

and elongation properties and can also be painted over. The main advantage of Flexiseal® is that, unlike silicone, it requires no primer to adhere to concrete and brickwork and is exceptionally UV-resistant. In addition, Flexiseal® is ideal for bathroom and kitchen applications as it contains a fungicide.

Applications include filling wall cracks that can then simply be painted over, sticking polystyrene insulation sheets under IBR, sealing window and door frame surrounds, and sealing such hard-to-reach areas as between a wall and a bath or basin.

It can also be used as a ceramic wall tile adhesive, and even sealing and joining leaking gutters. Other uses include concrete expansion joints, sealing around electrical wires where these go through grommet holes, and patching up nail holes in walls.

Connect with Pratley on Social Media to receive the company's latest news: Facebook: <https://www.facebook.com/PratleySA/> Twitter: <https://twitter.com/PratleySA>

## Adding space is a ‘steel’



A project in Tyger Valley.

IN the current difficult economic situation with budget restrictions, any property owner needs to make effective use of the space in their building in order to gain the full benefit of the square meterage available. SMF Designs can create that extra space or access with walkways, mezzanine floors and platforms. Its services include everything from consultation with the conceptual design, through manufacturing to installation. The integrity of the structure is verified by in-house engineers and products comply with all safety

standards and regulations.

A new structure can be installed during normal working hours with minimal disruption or downtime, on time, and to budget.

SMF Designs has been building steel structures for over 20 years and is based in Montague Gardens and while working mainly in the greater Cape Town area, operate further afield in the whole of the Western Cape. Although specialising in structural mezzanine floors, related structures are undertaken including walkways, balconies,

ramps, pergolas, staircases, ladders and balustrades. Working mainly in mild steel and timber a wide variety of designs can be accommodated to suit every need.

SMF Designs an extensive client base ranging from large industrial and commercial concerns to domestic applications and include wine and agriculture, chemical and food, packaging, warehousing, clothing, entertainment and service industries.

To study examples of their work visit: [www.smfdesigns.co.za](http://www.smfdesigns.co.za).

## Novel high-performing debondable adhesives from natural ingredients

*Sustainable hot melt adhesives resolve manufacturers from traditional hurdles in bonding*

CONAGEN, a Massachusetts, USA based biotechnology innovator, has developed a unique debondable hot melt adhesives made by high-performance materials from sustainable and natural biomolecules.

“Conagen has solved the challenges manufacturers face in seeking strong structural adhesives that are long-lasting, perform strongly, and have the valuable option for breaking the adhesion before final finishing operations to deliver perfect products,” said J. McNamara, vice-president of chemical applications.

The advantages of high-strength debondable adhesives benefit multiple industries. For example, smartphones

and electronics can be repaired effortlessly, and deconstructed at the end of their life without damaging components for recovery and recycling of valuable parts currently in landfills.

“Conagen’s patented debondable hot melt adhesive are stronger than what is used in the market now and can outperform petroleum-based products with a sustainable advantage that saves time, cost and reduces waste,” said McNamara.

He further states, “The unexpected boost in performance comes from Conagen’s fermented ingredients already at full industrial scale.” And, “Conagen is open to discussing commercialization opportuni-

ties with manufacturers who are interested in a new era of performance materials.”

Adhesives offer many advantages in joining materials, including the ease of use compared to welding, sealing, distributing stress, and environmental resistance. Currently, manufacturers glue two pieces together and wait for a day to cure the bond. If there are imperfections in the bond, the glued products are thrown away because they cannot be unglued, resulting in time and material waste.

Today, most reactive hot melt adhesives rely on post-curing chemistry to develop adhesive strength. A downside to this approach is the curing process is irre-

versible and, as such, hinders or prevents de-bonding almost entirely.

While the ingredients of Conagen’s hot melt adhesives are commonly found in nature, to develop sustainable debondable adhesives, Conagen leverages its precision fermentation technology to engineer a synthetic pathway independent of plant source materials, creating more efficient and sustainable bio-based ingredients than what can be achieved with chemically-synthesized versions.

Conagen’s inspiration is self-healing materials, using sustainable and natural ingredients, turning them into high-strength debondable hot melt adhesives.

“The process is as simple as cutting the plastic that reheals itself in less time than the conventional way,” said McNamara.

The Conagen adhesive is unique as it is a cross-linked material designed with reversibility in mind that exhibits the strength of traditionally cured adhesives with the added benefit of transitioning to a flowable material after heating.

Conagen’s debondable adhesive formulation is ideal for cars, boats, planes, transportation, consumer electronics and appliances, and military and industrial applications.

The adhesives market stood at \$729.11 billion in 2019 and is projected to exhibit a CAGR of 5.3%



between 2020 and 2027, making Conagen’s adhesive formulation lucrative in the original equipment manufacturers (OEM) market.

Conagen’s hallmark in the specialty and industrial space is discovering applications from the platform of natural bio-compounds and bio-materials for a new era of materials that are both high-per-

forming and sustainable.

“Our adhesive formulation continues to show promise for bonding a wide array of materials, such as metal, plastic, and glass,” said McNamara. “We’re making it easier for companies to adopt a more natural position in manufacturing while staying true to the performance of their products.”

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# Gensets beat outage deadline

“WITH our design and manufacturing experience, we can provide genset solutions that can be started up prior to an outage, so that the plant can con-

tinue operating seamlessly while switching from utility to standby power, and back again to the utility,” says Damian Schutte, electrical engineering team

leader at Zest WEG. For a recent project in the Western Cape, the Zest WEG team provided a plant to a customer in the marine sector with

a customised genset solution to suit its specific needs. The plant was experiencing considerable downtime due to loadshedding by the national utility, as it would take some time to bring the plant back to operation. The engineered solution includes six 550 kVA generators, two 11 kV transformers, medium-voltage (MV) switchgear, and breakers for synchronising between generators themselves and also with the utility. “The smaller size of generator provides flexibility and is a cost saving, as some units can be switched off depending on the site load requirement,” explains Damian.

### Urgent solution

When frequent loadshedding was suddenly announced by the utility, the customer asked Zest WEG for an urgent temporary solution while continuing to implement the project. The team brought three of the gensets on-stream to keep the plant functional until the planned solution was in place.

“The smaller size of generator provides flexibility and is a cost saving...”

All major components for power plant solutions such as these can be manufactured and assembled by Zest WEG and Brazil based parent company, WEG. The company can, however, accommodate a client’s specifications should they refer to a nominated supplier, allowing the gensets to be built for easier on-site installation.

“Our extensive engineering and programming on these systems makes it vital that they are fully tested before being delivered to site,” Damian concludes. “Whatever we specify in the contract can usually be tested in-house at our advanced facility in Cape Town.”

Customers are invited to attend the factory acceptance test (FAT), which includes load testing of the generators at different loads up to 110%, synchronisation checks, and MV tests if this is part of the scope.

For more information visit: [www.zestweg.com](http://www.zestweg.com)



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# Prolonging the lifecycle of wind farm transformers

By David Poggiolini

**OILWATCH** Transformer Laboratories is helping project developers and independent power producers improve the reliability of their wind farm transformers. These expensive and critical equipment items bolster turbine generator output from a few hundred volts to medium voltage distribution levels.

Pad mount liquid-insulated transformers are typically used on wind farms. However, they are usually rated as distribution transformers and not generator step-up units and this has contributed to their failure in these applications. In extenuating circumstances, a failure can result in explosions or fire that could damage property and the environment, while also placing lives at risk. Moreover, load may be interrupted for protracted periods, depending on the extent of the damage which may involve either undertaking major repairs or replacing the entire transformer.

Considering the failure rate of these transformers, many project developers and owners are now insisting on more durable units that have been designed specifically for these applications. Among the factors that need to be considered in their design include transformer loading and sizing; harmonics and sinusoidal loads; voltage variations; and other unique requirements that contribute to the failure of this equipment.

"The role of the transformer in these applications needs to be more carefully analysed and evaluated. It is imperative that developers and owners base their decisions on total cost of ownership; network stability; and uptime. This is opposed to the lowest initial cost of the transformers without considering the negative impacts of extended downtime and on revenue due to having to repair and replace them prematurely," Shiven Brijlal, Managing Director of Oilwatch Transformer Laboratories, tells Cape Business News. Oilwatch Transformer Laboratories has an impressive track record helping asset managers achieve the required



levels of safety and reliability from their fleet of transformers at a minimum cost. This is by providing them with a sound understanding of the changes in the internal condition of the transformer. In doing so, asset managers are better able to determine the minimum required budgets for maintenance and replacement of their power transformers. This information also enables them to identify the most effective and targeted manner to spend this budget, which also usually needs to be justified to stakeholders and regulators in an increas-

ingly competitive environment.

A critical first step in any power transformer analysis entails undertaking an insulating oil investigation. Analysing the dielectric liquid inside the transformer provides important information on its internal condition. This includes behavioural patterns of the liquid itself and the various components that are immersed in it. In addition to being used to assess the condition of the transformer, these tests inform predictive maintenance planning to prevent unexpected outages.

This investigation includes a Dissolved Gas Analysis (DGA). A DGA is a powerful diagnostic technique that is used to analyse dissolved gasses that are generated during the dielectric fluid and solid insulation decomposition process. The main gas signatures identified in a DGA include hydrogen and carbon oxides, in addition to sparking and arcing gasses. Hydrogen is the key gas for partial discharges in oil or gas and methane will also typically be present. Carbon oxides are generated by the breakdown of the solid cellulose material

and hydrocarbon by the partial discharges of the sparking type. High levels of acetylene, hydrocarbon gases and hydrogen are as a result of a complete breakdown of the insulation, usually due to winding to winding or winding to ground. As part of the analysis, the laboratory also considers "stray gassing of oil", which is a non-damage fault. This occurs in transformers at temperatures from 105°C. Hydrogen, methane and ethane may form in all equipment at these temperatures or because of oil oxidation, depending upon the oil chemical structure.

A highly specialised and multidisciplinary field, DGA is a tried-and-tested technique that has been successfully deployed since the 1960s to help prevent catastrophic failures of power transformers. It has since become the most informative test available to asset managers to assess the condition of their power transformers. Laboratory DGAs remain popular because they are more cost-effective, efficient and accurate than online and portable alternatives.

Brijlal says that to achieve a greater than 90% Confidence Normality in a DGA

interpretation, a combination of the relevant standards and methods is required, with the rates of gas rise of overriding importance.

"Access to reliable data is just as critical in reliability engineering. Inaccuracies can quickly aggregate and escalate from a minor objection into something much larger that can, inevitably, compromise all the efforts previously invested in better understanding the condition of a transformer. It is, thus, critical to first obtain a reliable sample when undertaking this type of analysis," he says.

Oilwatch Transformer Laboratories is one of only a few transformer oil testing laboratories that is accredited to the ISO/IEC 17025 standard. This global standard recognises the technical competence of a laboratory to perform specific tests. It, therefore, transcends the requirements of the ISO/IEC 9001 which only relates to the correct calibration of laboratory equipment. The updated standard also takes into consideration the importance of impartiality. Only authorised personnel may, therefore, release opinions and interpretations based on relevant standards.

## Lighting up the Dome

JOHANNESBURG's iconic Dome which was originally designed to be a car dealership but was utilized as an exhibition centre hosting international events, has been reinvented to serve its original purpose as a prestigious automotive dealership. RLS was approached by Plan-tech Engineers and Boogertman Pretoria to supply the decorative interior lighting, entrance canopy lighting and general office lighting. RLS supplied the Linear Pro surface mount under the canopy at the entrance. A bespoke L-shaped Strata pendant is suspended above the reception desk and three bespoke curved 15m Strata pendants in orange and black make a statement and invite you from the entrance of the dealership to the start of the impressive showroom floor. In addition, 1.2m Vista Pro pendants and 1.6m Vista Pro pendants highlight the seating areas at the We Café and reception area. Kibo 70 downlights were supplied in the bathrooms and Luxon 600x600 prism backlit recessed panels for the office areas.

For more information contact: <https://www.regentlight.co.za/>



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# Save costs with Ctrack

“DESPITE our 35 years of experience in managing vehicles and assets, we are always looking for new solutions that help our customers run their businesses as effectively as possible,” says Hein Jordt, CEO of Ctrack SA.

Ctrack offers a variety of technologies for positive and accurate driver

identification which include Dallas iButton keys, RF ID cards and, in the near future, via biometrics, making it easy to determine which driver was driving what vehicle, in what manner and when. A starter lockout can be installed to prevent the vehicle from starting without the correct authori-

sation via the driver identification system, completely eliminating any risk of unauthorised use.

Video footage from the in-cabin Iris Dashcam can confirm correct driver identification if need be. This wind-screen-mounted camera solution includes ADAS and DSM fatigue func-

tionality with a third wired camera for in-cab placement. Connectivity is via 4G, Wi-Fi or Bluetooth. Footage can be viewed via a desktop platform, web-based platform, Android or iOS mobile application or live streaming and includes GPS location and event setup.

Driving style and

behaviour can also have a significant impact on your business. Drivers who breach road regulations risk their own safety, the safety of others but are also the cause of additional costs for the business such as fuel, maintenance, insurance and even traffic fines if these are not allocated to the individ-

ual driver correctly.

Ctrack’s driver management tools provide multiple solutions to ensuring that vehicles run effectively, efficiently and safely. These tools also allow for the management of operators, access, and behaviour across multiple vehicles and assets.

As an example,

Ctrack can monitor speed in a variety of ways, including map speed, a predetermined speed limit on a telemetry device or via a physical speed limiter on the vehicle. If needed, Ctrack SMILE script technology can also adjust a vehicle’s top speed capabilities based on predetermined Geo zones.

The Ctrack Driver Centric Mobi application allows driver scores to be logged and data used to improve driving performance. The application also features a fully-fledged vehicle pre-inspection form that is completed and managed digitally through the Ctrack Driver Mobi web app.

The driver display unit provides the driver with job-specific information such as job dispatch, navigation and messaging. The functionality of this system in a safe and controlled manner means that drivers are always on the most economical route, which saves time and avoids clocking up unnecessary mileage, resulting in increased productivity.

Ctrack’s On the Road solution is high quality, reliable, fleet specific software that can be utilised with any Android-based device. It gives the driver all the tools they need to do their daily job while allowing fleet managers to ensure that their assets are being used most effectively. The On the Road product combines navigation and fleet tools with an operating system that integrates with all the Ctrack software platforms for easy data extraction.

As fuel accounts for a large portion of a fleet’s total operating costs, consumption needs to be carefully controlled. The Ctrack Fuel Solution gives you eyes in the tank, live monitoring of fuel consumption and levels, and real-time fuel analytics. This reduces fuel loss risk.

Ctrack’s rich fleet analytics and smart interpretation of data provide the information needed for critical decision making, from cost savings to future investments.

“Saving costs is a natural by-product of Ctrack’s wide variety of tracking and fleet management solutions that allows fleet managers to have eyes on all types of moveable assets through bespoke software solutions and ensures that they are used in the safest, most effective way possible,” concluded Jordt.





Always Visible

## Transport & Logistics

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<p> <b>In Cab Device</b></p> <ul style="list-style-type: none"> <li>• Job Dispatch</li> <li>• Navigation</li> <li>• Messaging</li> <li>• Driver Behaviour Display</li> </ul>	<p> <b>Driver Identification &amp; Driving Behaviour Monitoring</b></p> <p> <b>Engine Performance Monitoring (CAN)</b></p>	<p> <b>Remote Door Unlocking</b> Door Open/Close Sensor</p> <p> <b>Fuel Level &amp; Consumption Monitoring</b></p> <p> <b>Vehicle &amp; Fleet Tracking</b></p>

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# Companies need to prioritise cargo security to build resilience

By David Poggiolini

THE warehouse has become the most vulnerable link in the supply chain for crime syndicates. This is evidenced by the recent spike in warehouse robberies that have involved the theft of millions of rands of high-value goods.

"It has become increasingly difficult to breach tighter security measures that have been implemented at the airports and during the actual transportation of the goods to better safeguard against cargo theft. However, warehouses are often neglected. They, therefore, currently provide the easiest point in the supply chain from which to steal high-value goods. Often, the weak link is the 'insiders' – people working throughout the supply chain and specifically in these facilities. Many are forced, coerced, or tempted into providing sensitive information that will help syndicates gain illegal access to the premises and to valuable commodities. Sometimes, they are directly involved in aiding and abetting the crime. These crimes are also well planned. For example, there is usually a spate of warehouse burglaries during the Easter Weekend when most staff are on vacation, and the facilities, rely mainly



High value storage – a sitting duck for thieves?

on skeleton crews.

Incidents have also sometimes been violent in nature with access gained through 'Trojan Horse' tactics, staff held up at gunpoint and tied up by the perpetrators," Managing Director of Secure Logistics, André Du Venega, tells Cape Business News. The Certified Fraud Examiner (CFE) and Certified Security Management Professional (CSMP) has extensive security experience. This includes 14 years working for the South African Police Services mainly investigating organised cargo crimes. This is in addition to 21 years in Security Risk Management, of

which 16 were spent specifically in the cargo protection industry. Notably, he is currently undertaking research into the role that the Transport Asset Protection Association's (TAPA) Facility Security Requirements have played in improving the protection of cargo in the Europe, Middle East and Africa (EMEA) region.

Du Venega is the South African Lead of TAPA's EMEA Region, and the research is being undertaken for a thesis he is completing to attain an Executive Master of Business Administration Degree from the University of Cumbria, UK. This is

the very first time that this topic has been researched in this context. He expects to see a continued significant improvement in cargo security operational effectiveness through the implementation of TAPA's certification programmes. The research will also be a sound starting point for more companies to share information that will help improve security of cargo. At present, this is a major stumbling block in improving cargo security in South Africa. Since the disbandment of specialised police units, such as the Gauteng Truck Hijacking Unit, for which

Du Venega served as Detective Captain and 2iC between 1992 and 1998, there has been limited sharing of information between companies to help improve cargo security. Certainly, the situation has also played its part in the marked increase in the hijacking of valuables in transit in South Africa.

The point of delivery of the high-value goods and their transportation over the "last mile" to the consumer by courier services and sometimes smaller companies also remain notoriously weak points in the supply chain. Du Venega says that these areas of the

supply chain were also targeted during the lockdown period when there was an exceptionally high demand for electronic products, such as laptops, notebooks and tablets. Many of these stolen products will often end up across the country's borders although there is also a thriving market for them in this country.

Despite the increase in security in other areas of the supply chain, syndicates do still breach them. Trucks transporting valuable goods to and from the airport are always at risk. "There are more attempts at stealing high-value goods on our roads than there are for cash in transit. Bear in mind that a single truck could be transporting between R10-million and R20-million-worth of top-end electronics. These incidents are usually just as violent as those that involve cash-in-transit attacks with shots fired at truck drivers and the escort vehicles. Security staff and drivers are also often abducted and threatened as part of the attack.

Secure Logistics continues to work closely with leading companies and their third-party logistics provider to develop and implement a comprehensive cargo security service. This includes risk consulting, cargo protection services and investiga-

tions. Moreover, the company has earned a reputation for the high quality of its airside protection and monitoring, as well as armed surveillance escort services. The company also transports high-value cargo using the latest protection technology, including anti-jamming and locking systems. Moreover, the company secures sea-freight containers with specially designed locks. The service includes inspecting containers and monitoring their movement from the company's sophisticated control room and via its escort services.

"Security is very seldom a top priority for companies. The reality is that many companies still only respond reactively when chaos erupts after a disruption in the supply chain. If security is not taken seriously and considered a priority in business, then reputations are compromised, staff demotivated and the entire business negatively impacted when customers start leaving. Security is a long-term initiative that requires ongoing top management involvement right down to every worker if success is to be achieved. The phases of good security include risk identification, risk mitigation and resilience strategies, among other factors," he concludes.

## Protecting sophisticated engines from suspended water

By David Poggiolini

SOUTH African filtration technology is helping companies to save significantly in engine repair and replacement costs. This is achieved by successfully addressing both free and suspended water in fuel, which pose a risk to high-pressure injectors in Tier 3 and more sophisticated engines. Water mixes in with the fuel making it appear cloudy. This free and suspended water instantly turns into steam inside high-pressure injectors in these advanced engines. In severe instances, their tips "shoot" into the cylinders as a result of the high pressure or over-fuelling causing significant heat damage to engines.

Most modern filters are mainly designed to address particle contamination, with very few of these technologies able to attend to suspended water in a sustainable manner. This is despite sus-

pending or free water posing an even greater risk to these engines than particle contamination. So says Andre Steyn, Director of iCerMax, a local manufacturer of solutions for primary, secondary and final filtration for bulk tanks and on-board applications that are helping to address the challenges associated with the poor quality of Africa's fuel.

"Modern engines are failing in the field simply as a result of a few drops of suspended water, while severely contaminated diesel can result in a significant catastrophe, leading to unwanted downtime and costs. We have seen a marked increase in interest in our technology due to the failure of many sophisticated engines, especially Tier 4 technologies, in a variety of applications, due to water-contaminated fuel. They include essential generators that help supply uninterrupted energy to datacentres through to the agricultural sec-

tor that is increasingly relying on tractors that are powered by sophisticated engine technology," Steyn tells Cape Business News.

The company has also supplied its solutions to a well-known South African original equipment manufacturer (OEM), and they are now permanent features of these construction, mining and agricultural machines. ICerMax has also assisted transporters, mines and the construction industry to overcome the limitations of conventional filtration technology that do not adequately protect these advanced engines from highly contaminated fuels across Africa.

Static cone centrifugal filtration systems, for example, only remove free water and not suspended water. Meanwhile, most standard on-board water filters are manufactured from a rough yellow cellulose filtration medium that cannot remove suspended water. While premium market fil-

ters use a white ultra-smooth treated medium to enable water coalescing, they also have their limitations. Water only coalesces on the ultra-smooth filtration media surfaces which then becomes caked with particles. It is, therefore, only effective in removing suspended water in the initial filtration stages.

Further exacerbating this challenge is the inability of spin-off filters to indicate the presence of water. It also only provides limited storage capacity for water away from the filtration medium. As Steyn explains, if not displaced from the filtration medium, water will simply be forced through via differential pressure.

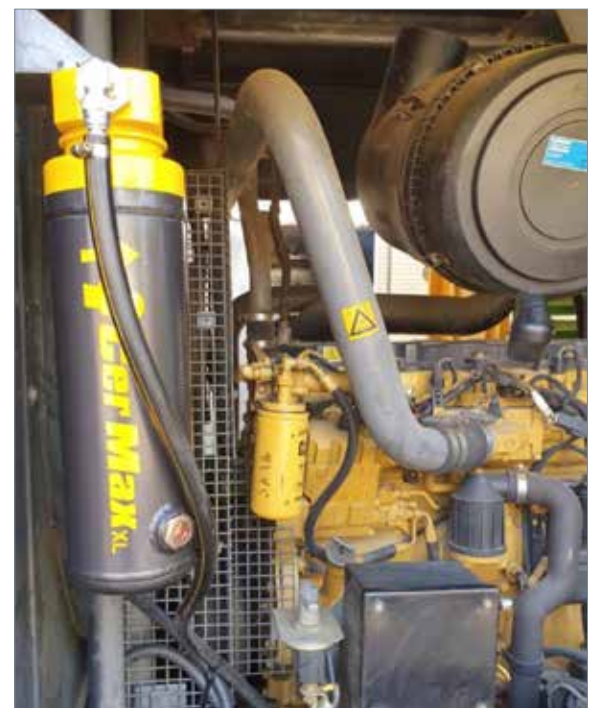
Fulfilling a dual-functional role by coalescing and purifying according to the specific needs of clients, iCerMax's proprietary technology can be deployed at various stages of the fuel-supply chain, including at bulk fuel receiving, transfer

and dispensing stations. It is also being used for storage kidney circulation and tank cleaning to sustainably remove suspended water from very contaminated fuel and bio-diesel blends.

Manufactured from durable materials, the filters are able to withstand multiple surges and the effects of hammering, as well as operating and variances in pressure. They also provide sound capture and micron efficiency under these conditions. The proprietary steel filtration mediums are also not affected by particle caking and by free water contact.

Due to their structural integrity, the iSo-SpecSure filters also eliminate dirt seepages that compromise fuel cleanliness levels.

All of the company's solutions also allow for real-time monitoring



of the filtration process to enable accurate estimation of replacement intervals and maintenance. They also enable the easy draining of water.

"Unfortunately, many companies are still taking a reactive approach to managing the risk of contaminated diesel. They

approach us when they suspect that their fuel has been contaminated with water, by which time they have incurred downtime and major costs. With the advancement into Tier 4 engines into the country, this is going to become a very costly practice," Steyn concludes.

## RTF's make inroads on farms



By David Poggiolini

DEMAND for robust yet cost-effective equipment remains high. This is especially so in the agricultural sector where elevated input costs have placed pressure on local farmers. They continue to be the main market for Wuhlf's Meerkat ATF 920 rough terrain forklift (RTF) which is claimed to retail at half the price of its closest competitors, while offering an array of features that have made it appealing to the agricultural sector for materials-handling applications. These

include 4x4 drive, full hydraulic articulated frame with a steering angle of 35°, large tubeless tyres and 240mm-high ground clearance. Wuhlf currently sells between 15 and 30 Meerkat ATF 920 off-road forklifts every year. Some of these machines are also exported to other African countries, including Nigeria, the Democratic Republic of Congo and Kenya, with the company having also recently secured a contract to supply units to the Ugandan government.

More recently, Wuhlf also started supplying these rough-ter-

rain forklifts to brick producers for arduous materials-handling applications. The machines have a rated 2,5t lifting capacity that has been certified by the South African Bureau of Standards. The machines have a maximum lifting height of 3m and lifting speed of 600mm/second. Masts can tilt at angles of 12°/6° and a side-shift allows 200mm either side. This makes the Meerkats ideal for transporting heavy brick loads from the factory to the dispatch area and onto trucks that are destined to work-sites and retail outlets.

## Engen refuels Truck Test 2022

Engen is continuing its fuel sponsorship of the annual Truck Test, with all participating trucks running on Engen Dynamic Diesel 50ppm with Pro-Drive.

**Q1** - What value does Engen see in the Truck Test programme?

**A** - The annual Truck Test event is all about finding the best-in-class trucks with respect to fuel efficiency and productivity in a diverse field of formidable contenders. When the results are published at the end of the test, it affords transport companies a clear picture of the performance of the tested vehicles under very real conditions. This can assist them to make more informed buying choices.

Truck Test gives Engen the opportunity to promote Engen Dynamic Diesel 50ppm with Pro-Drive technology, which will once again be used by all participating trucks.

**Q2** - Engen Dynamic Diesel 50ppm is formulated with Pro Drive. What does this mean for the driver or operator of the vehicle?

**A** - Our most advanced, unique combustion improver technology delivers 2% more



Vehicles line up for Truck Test.

power for a smoother drive; more response during stop-go, cruising, and heavy loads with 4% better acceleration. The unique dual detergent for deep cleaning across old and modern diesel engines enables a 3% improvement in fuel consumption.

The new active ingredient in the formulation is proven to make your vehicle feel lighter at the touch of the pedal, and is the first ever in Africa with its unique combination of combustion and detergent system technology.

**Q3** - Engen was the first petroleum company in SA to market AdBlue. 2016 saw the inclusion of AdBlue to the Truck Tests where consumption was monitored for interest. What is AdBlue and what has happened since it was introduced in 2016?

**A** - Most modern diesel-powered vehicles built after 2006 use SCR (Selective Catalytic Reduction) Technology to inject AdBlue into the vehicles exhaust gases. When AdBlue combines with

exhaust emissions, it breaks down the harmful nitrogen oxides in the diesel exhaust and produces harmless nitrogen and oxygen.

AdBlue was a natural fit to the Engen product offerings of Engen Dynamic Diesel 50ppm and Engen Low-SAPS Lubricants.

Today, the demand for AdBlue is significantly greater as more and more Euro-5 and Euro-6 vehicles are operating on our roads. Engen AdBlue trades under the name Air1® and is supplied to most major OEMs in SA.

## Startups apply artificial intelligence to supply chain disruptions

By Nick Carey

OVER the last two years a series of unexpected events has scrambled global supply chains. Coronavirus, war in Ukraine, Brexit and a container ship wedged in the Suez Canal have combined to delay deliveries of everything from bicycles to pet food. In response, a growing group of startups and established logistics firms has created a multi-billion dollar industry applying the latest technology to help businesses minimize the disruption.

Interos Inc, Fero Labs, KlearNow Corp and others are using artificial intelligence and other cutting-edge tools so manufacturers and their customers can react more swiftly to supplier snarl-ups, monitor raw material availability and get through the bureaucratic thicket of cross-border trade. The market for new technology services focused on supply chains could be worth more than \$20 billion a year in the next five years, analysts told Reuters. By 2025, more than 80% of new supply chain applications will use artificial intelligence and data science in some

way, according to tech research firm Gartner.

"The world's gotten too complex to try to manage some of these things on spreadsheets," said Dwight Klappich, a Gartner analyst.

Interos, valued at more than \$1 billion in its latest funding round, is one of the most successful in the nascent market. The Arlington, Virginia-based company says it has mapped out 400 million businesses globally and uses machine learning to monitor them on behalf of corporate customers, alerting them immediately when fire, flood, hacking or any other event causes a potential disruption.

Before Russian tanks rolled into Ukraine in February, the company had assessed the impact of an invasion. Interos said it identified about 500 U.S. firms with direct supplier relations with companies in Ukraine. Further down the chain Interos found 20 000 U.S. firms had links to second-tier suppliers in Ukraine and 100 000 U.S. firms had links to third-tier suppliers.

Chief Executive Jennifer Bisceglie said after the war started 700 companies approached Interos for help in assess-



Shipping containers pass through the Suez Canal in Suez, Egypt February 15, 2022. Picture credit REUTERS/Mohamed Abd El Ghany.

ing their exposure to suppliers in Ukraine and Russia. She said the company is developing a new product to game out other hypothetical supply chain disruption scenarios, such as China invading Taiwan, for customers to understand their exposure to risk and where to find alternative suppliers.

Supply chain shocks are inevitable, Bisceglie told Reuters. "But I think we're going to get better at minimizing these disruptions."

U.S. airline Delta Air Lines Inc, which spends more than \$7 billion a year on catering, uniforms and other goods on top of its plane and fuel budget, is one company using Interos to keep

track of its 600 primary suppliers and 8 000 total suppliers.

"We're not expecting to avoid the next crisis," said Heather Ostis, Delta's supply chain chief. "But we're expecting to be a lot more efficient and effective than our competitors in how we assess risk when that happens."

Santa Clara, California-based KlearNow sells a platform that automates cumbersome paper-dominated customs clearance processes.

That has been a lifesaver for EED Foods, based in Doncaster, England, which imports Czech and Slovak sweets and smoked meats for expat customers in Britain. "Before Brexit

we were very scared we would have to shut down," said Elena Ostrerova, EED's purchasing manager. "But instead we are busy as never before."

Ostrerova says her company is still growing at annual rate of 40% after Brexit took effect in early 2020, partly because some competitors gave up rather than tackle the onerous new paperwork for importing from the European Union.

She said KlearNow's customs clearance platform keeps track of its hundreds of shipments from Central Europe, tallying totals on thousands of items, correcting mistakes on everything from country of origin

to gross net weight, and providing an entry number - under which all the information about a shipment is contained - for the company hauling it to Britain.

"We have minimum human involvement," Ostrerova said, which saves the company time and the cost of manual data input.

Berk Birand, CEO of New York-based Fero Labs, said the coronavirus pandemic highlighted the need for manufacturers to adapt to changing suppliers so that they can continue to make identical products, no matter the origin of the raw materials.

The startup's platform uses machine learning to monitor and adapt to how raw materials from different suppliers affect product quality, from varying impurities in steel to the level of viscosity in a surfactant, a key ingredient in shampoo. The system then communicates with plant engineers to tweak manufacturing processes so that product consistency is maintained.

Dave DeWalt, founder of venture capital firm NightDragon, which led Interos' \$100 million Series C funding round last year, says regulators

are going to take much greater interest in supply chain risk.

"If you have a supply chain issue that could cost you major shareholder value, you'll have a major responsibility too," DeWalt said. "I believe that's coming in the near future."

Major logistics firms are also deploying machine learning to boost their competitiveness. U.S. truck fleet operator Ryder System Inc uses the real-time data from its fleet, and those of its customers and partners, to create algorithms for predicting traffic patterns, truck availability and pricing.

Silicon Valley venture capital firm Autotech Ventures has invested in both KlearNow and newtrul, which aggregates data from transport management systems in America's highly fragmented trucking sector to predict pricing changes.

"Mapping your supply chain and interconnectivity at the individual part level is the Holy Grail," said Autotech partner Burak Cendek.

Reporting By Nick Carey  
Editing by Bill Rigby  
of Reuters. Visit [www.reuters.com/technology](http://www.reuters.com/technology)



# Why alternative coatings boost hydraulic systems performance

AN integrated approach to the sealing systems in hydraulics using chrome alternatives helps engineers to achieve optimum function.

Alternatives to chrome coatings are becoming more commonplace for coating piston rods in hydraulic systems, which is due to the 2017 REACH (registration, evaluation, authorisation and restriction of chemicals) restriction on uses of any coating or plating using hexavalent chromium (CR6). This was designed specifically to protect humans and the environment from harmful chemicals.

The majority of sealing surface-finish guidance is still based on 2D finish characteristics when used with chromium layers, which can significantly affect performance and system life in hydraulic systems. This is because the lubrication in these systems is fundamentally affected by the surface finish of the mating surfaces.

A 3D approach is a better solution which takes into consideration the intersection of seals, fluid and mating surface finish.

### Understanding how surface finish and roughness become important

Whether a single or double-acting, a hydraulic cylinder converts energy that is stored in the hydraulic fluid into a force that moves the cylinder in a linear direction. The cylinder barrel contains a piston that connects to a piston rod with coatings usually applied to the piston rod which improves its friction characteristics. This maximises performance and minimises wear with the coatings finished to roughness recommendations so that the seal achieves optimum function.

Surface roughness means the deviations in the direction of the regular vector of a surface from its ideal form. Small deviations indicate a smooth surface whereas large deviations mean a rough surface.

The most regularly used roughness parameter is the Ra, which is the arithmetic average of all absolute values of the profile height deviations from the mean-the



average of a collection of single measurements of a surface's peaks and valleys.

Two other common 2D measures are Rz and Rz1max, with Rz being the average measurement of the vertical distance from the highest peak to the lowest valley in five sample lengths. Rz1max takes the largest of the five Rzi values from the sampling lengths over the complete measured length.

The issue with using these 2D measures is that alternative coatings have a fundamentally different topography.

### Analysing your processes

By differentiating in terms of the manu-

facturing process, coating and the distinction of the piston rod or piston tube you can use an extended approach for describing mating surfaces.

Thorough dynamic tests using a number of sealing loads and materials in both road and piston configurations were conducted which have revealed the leakage of the system and wear behaviours of both the seals and mating surface which determines the limits of each parameter.

### Using lubricant optimised hydraulic sealing systems

Surface topography plays a critical role in system life, but it is not the only factor that affects how

long equipment performance at its maximum level. Combining an understanding of surface finish and tribology coupled with lubrication management technology you will realise a fully optimised hydraulic sealing system.

Lubrication management uses a tandem sealing arrangement where the primary seal has a rounded contact surface which enables an ideal lubrication-film to form plus it extends to a secondary seal.

This has proved through side-by-side testing on laser-clad piston rods with matching surface topography with results showing significant reductions in surface smoothing for the system using lubri-

cation management. The system with lubrication management experiences reduced friction and up to four times less seal wear on primary and secondary seals which demonstrates how it can extend to system life.

### Recommendations for alternative coatings

Detailed surface finish measurements have revealed recommendations for chrome-plated surfaces that don't completely characterise the necessary parameters for surfaces that use alternative coatings. The extended approach to measurements and analysis plus numerous tests have allowed for benchmarking of proper surface finish recommendations for a comprehensive spectrum of surface coatings and hardware configurations.

Testing on tuned surfaces has shown that current performance limits of sealing systems can be extended by adding lubrication management technology, producing higher robustness than tribologically assessed mating surfaces alone.

Information supplied by: <https://www.dynamicpumps.co.uk>

# Powerful air impact wrench



THE Ingersoll Rand® 2850MAX 1" D-Handle Impact Wrench is the most powerful 1" pneumatic impact wrench in the Ingersoll Rand vehicle service portfolio. The 2850MAX has 2 847Nm of maximum reverse torque to loosen stubborn lug nuts with less effort from the technician. It delivers 5 500 r/min and 770 blows per minute (BPM) to complete heavy-duty tasks. The 2850MAX is available with a 150mm anvil or a standard anvil.

The tool's 150mm anvil helps remove bolts from deep tire wells on large vehicles like semitrailers, buses, trailers and tractors. The tool is also available with a standard anvil to accommodate a wide variety of heavy mechanical automotive applications. A steel core and optimized internal mechanism provide technicians the power they need without adding extra weight to the tool.

Other advantages of the 2850MAX 1" D-Handle Impact

Wrench include:

- A weight of only 9,7kg, which is 25 percent lighter than the industry's leading 1" impact wrench. The high power-to-weight ratio reduces fatigue and increases manoeuvrability when performing maintenance on large vehicles
- A 360-degree adjustable side handle with an ergonomic grip so technicians can customize the handle location for the specific job at hand
- Chemical-resistant composite housing and steel nose to withstand the harshest working conditions
- A swivel hose connection to keep hoses from getting tangled so operators can move freely around the garage

To learn more about the Ingersoll Rand 2850Max 1" D-Handle Impact Wrench, visit [www.IRTools.com/2850MAX](http://www.IRTools.com/2850MAX).

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# Preventing catastrophic hydraulic systems failure

REGULAR checks or enforced system inspection at the time of shift changes is an excellent practice that should be part of monitoring and analysis to achieve hydraulic systems' operational efficiency.

The inclusion of inexpensive diagnostic tools alerts the system engineer to decreased system efficiencies while providing reports and data on below par conditions. This can mean the difference between a simple fluid top up or the catastrophic starving of the pump and resultant pump failure. Such checks should cover fluid levels, operating pressures, system temperatures, levels of fluid contamination, flowrates and the effectiveness of filtration in keeping oil to the required levels of cleanliness.

Hydrasales Cape Town, product support, Kevin Walker advises; "A stitch in time saves nine. Simple maintenance should not be neglected."

## Switch & sensor basics

The Euroswitch range of products is offered as a simple switch or

sensor. Switches are available as N.O. (Normally open) or N.C. (Normally closed). This simply means it will either open or close an electrical circuit. SPDT switches allow for N.O., N.C. or both. This makes the range very versatile and suited to most electrical circuits.

Euroswitch management systems are certified to UNI EN ISO 9001:2015 for Quality to UNI EN ISO 14001:2015 for Environmental protection and with Management Certification for health and safety at work UNI EN 45001:2018. ibuto make the company a receptive, dynamic interlocutor, ready to anticipate the times and

Kevin Walker adds. "A simple application of a switch like this can either stop a machine or alert the operator to faults such as low fluid levels or excessive system temperatures."

Sensors allow for monitoring via a transmitter, transducer or resistive sensor. The operator or maintenance team can receive live readings of temperature, level or pressure whether it be on



Pressure-temperature-level IO-Link Sensors.

a display at the operator's station or linked to the network.

**System Engineers should not neglect protective measures. It is cost effective!**

Some may think that the inclusion of sensors or switches is costly and complicated. It is NOT!

A simple, inexpensive low fluid level switch can be had for around R1 500 and can save thousands of rands in repairs. A low-level indicator is recommended to be

attached to the hydraulic tank and linked to the electrical circuit. Hydrasales, Cheryl Johnson mentions; "Typically, it will prevent system start-up if low fluid level is measured or reached. This is a very basic yet crucial requirement of a hard working system." Low levels of fluid can easily add extra heat to a system or worse, starve a pump. It has to be noted that a hydraulic pump can easily be one of the costliest components of a hydraulic circuit, where the lack of sufficient oil can cause

irreparable damage within a short period of time.

**Pressure switches: industry & applications**

Kevin Walker alerts maintenance staff to the use of pressure switches and transducers to be used in different industries and applications such as:

- HVAC, gas cylinders and air pumps that monitor and control the system's air pressure.
- Oil pressure

switches are used in engines as an actuator or sensor to determine when the engine's oil pressure has dropped below the pre-set level.

- Borehole & water pump pressure switches are used in residential and commercial buildings to maintain sufficient water supply.
- Vacuum pressure switches measure vacuum or negative pressure in the system. They are found in residential boilers, electric heaters, air compressors, and transmission systems.

**The Lubricant must not lose viscosity through extra heat!**

Heat plays an equally important role in lubricated systems. When temperature increases, the lubricant becomes thinner, and loses viscosity. Inversely, as the temperature decreases, the lubricant thickens and viscosity increases, making it more difficult to pour or pump. A sys-

tem may need heating or cooling to achieve the desired temperatures.

Without the correct viscosity wear rates increase resulting in reduced component lifespan or premature component failure.

The simple addition of a thermostat to an air blast cooler for example, will allow activation when desired preset temperature is reached and then switch off again when temperature levels drop. This cycling effect achieves effective and efficient cooling.

Outside of hydraulic systems there is a wide range of industries and applications that require heat control and monitoring. Typically they include radiators, heat exchangers, lubrication systems, the automotive, refrigeration and heating systems, coffee-making machines, automatic beverage vending machines and electrical household appliances.

For further information Email: [harpo@hydrasale.co.za](mailto:harpo@hydrasale.co.za) or visit [www.hydrasale.co.za](http://www.hydrasale.co.za) - Tel 027 11 392 3736

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## Local assembly of MACC drives to slash lead times

SEW-Eurodrive's expanded local capability out of its new Aeroton facility will include the assembly of SEW MACC air-cooled condenser drives for delivery at a rate of three units per week, slashing current lead times from overseas OEMs by approximately 36 weeks.

Built as part SEW-Eurodrive's M-Series modular industrial gear (IG) units, the MACC is a purpose designed gearbox solution for driving the modern fan-based air-cooled condenser (ACC) systems used in steam-driven power generation plants.

"The first SEW-MACC drives were installed at the South African concentrated solar thermal plant in the Northern Cape," says Jonathan McKey – SEW-Eurodrive's National and Africa Manager for Business Development, Sales and Marketing.

"This was followed by a further 24 units, which have now been installed at a utility station in Limpopo – and these Size 09 MACC drives are the largest ever built by SEW-Eurodrive."

The units were assembled in SEW-Eurodrive's factory in Nelspruit, but a new assembly line is now being built in Johannesburg to take production capacity to the next level.

"An ACC fan works in the same way as any cooling fan, but in power stations and industrial condensing systems, they need to generate huge air flows to efficiently condense exhaust steam from turbines. Our M-Series Air Cooled Condenser (MACC) drives adopt a modular design concept and gearing technology with specific optimisations to make them better suited to these applications," McKey explains.

Highlighting key innovations, he says that a stiffer case with built-in cooling vanes has been developed for improved cooling. "Our internal EBD (extended bearing distance) system has also been incorporated, which better enables the gearbox bearings to accommodate the very high axial and radial forces transferred through the fan and the drive shaft," he explains, adding that an optional dry-

well is also included to better prevent oil leakage at the output shaft, while still allowing standard mounting dynamics to be used.

With the EBD and the stiffer casing, SEW's MACCs offer larger service factors, can handle higher loads and the whole drive train is stronger and more robust. "We have also built-in a maintenance brake so that when servicing is required, wind from the outside can be prevented from turning the fan and the main shaft, improving safety risks and making the boxes easier to maintain in-situ.

These are compelling reasons for power stations to replace faulty ACCs with SEW-Eurodrive MACCs.

"To make this easier for plant operators, we build customised adapter plates to enable our design to be easily retrofitted as a direct replacement for any older-generation boxes currently in use. We also customise the output shaft length to perfectly match the ACC infrastructure onsite and to establish the ideal fan position for maximum efficiency," McKey adds.

## Drive-based solutions enhance operational efficiency and safety of machines

BMG's NORD predictive maintenance solutions offer fast, efficient and comprehensive evaluation of analogue and digital data, to enhance the operational efficiency and safety of machines. The intelligent PLC in NORD drive technology forms the basis for condition monitoring and predictive maintenance.

"BMG specialists use predictive maintenance as a methodical continuation of condition maintenance, with the prime objective of proactively maintaining machinery and equipment and detecting operational changes. Our NORD status-oriented maintenance system replaces traditional time-based maintenance to enhance the performance of the gear unit, electric motor and frequency inverter, for increased efficiency of the entire plant, as well as reduced downtime," explains Deon Crous, National Product Specialist, NORD Drive Systems, Electromechanical Drives division, BMG. "Digitalisation in drive technology boosts the added value our customers derive from drive data. This is especially so in drive systems in demanding



The intelligent PLC in NORD drive technology forms the basis for condition monitoring and predictive maintenance.

production environments, where industrial gear unit installations are usually used in critical applications and their failure could cause severe damage. For example, in mining, wastewater, intralogistics and the food industry, as well as in general heavy-duty applications.

"BMG's NORD drives for condition monitoring are based on intelligent algorithms and software in an Industrial Internet of Things (IIoT) environment, where networked drive units collect condition data in the inverter's integrated Programmable Logic Controller

(PLC) and pre-process it, together with data of connected sensors and actuators.

"An important advantage of this system is it offers our customers dependable data analysis, rather than merely data reading. Results of pre-processing or complete data can be optionally transmitted to an edge device, from which the data of all subsystems is managed and evaluated. This information is then available as pre-selected and edited smart data for further use and clear visualisation."

A common application example is the sensorless determina-

tion of the optimum oil change time, based on the oil temperature - which is the key factor for oil ageing in gear units.

This information is used in conjunction with gear unit parameters and specific operational parameters, to precisely calculate the appropriate oil change time, without the need for a physical temperature sensor.

BMG's electromechanical specialists are able to extend and adjust NORD drive equipment for the specific automation task, including drive monitoring, drive control and process control. The team is also able

to advise customers about the correct PLC software architecture for every application.

In smaller production plants, NORD scalability allows users to gain first experiences prior to reorganising the plant. There are three configuration levels available: At the first level, the drive unit PLC only performs drive monitoring. Drive parameters are pre-processed in the PLC and communicated to the higher level control system that is responsible for drive and process control. At the medium level, the PLC integrates the drive control and also runs drive-related functions. At the higher configuration level, the inverter PLC completely replaces the higher level control system.

NORD Drive Systems - developed by Getriebbau Nord and assembled locally by BMG - comprise optimum drive configurations, to ensure high-performance of mechanical speed control for specific applications, in almost every industry. Local assembly at BMG World in Johannesburg enables prompt delivery of drive systems and the quick availability of spare parts.

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## A culture of innovation and continuous improvement

G. FOX, South Africa's premier supplier of personal protective equipment (PPE) is driven by their purpose – "To keep people safe and areas clean." Through key partnerships, a focus on technological innovation and continuous improvement, G. Fox aims to provide the world's safest glove range. To that end, they have developed two new hand protection product lines and are distributors of a third.

### Evolution™

The Evolution range comes about as a result of the G. Fox ethos of always breaking new ground and offering "fit for purpose" products to its customers. "The EVOLUTION™ and CUTGUARD™ gloves and embody this ethos and are a result of five years of dedication, passion and research which has yielded the next level in safety gloves" says Mark Schewitz – Glove division manager. "Designed and tested for safety, comfort and endurance, these gloves provide maximum hand protection and durability in the most rugged and physically challenging work conditions such as automotive, mining, rigging, construction and machine assembly amongst other tough industries" he continues.

"The proprietary Evolution™ Ripple Technology palm coating offers superior grip in dry, wet and oily conditions as

well as best-in-class abrasion resistance, while the Evolution™ Impacto Technology offers back-of-hand protection for knuckles and finger joints, safeguarding them from shocks, crushes and impacts" he adds. Added to the above, the grip, durability and cut resistance in the CUTGUARD™ range have been enhanced while the glove's impact on hand health has been reduced.

The design and material used allow for maximum freedom of movement and dexterity.

The range is independently tested by accredited laboratories that carry the Conformité Européenne (CE) mark, all components and materials used in the manufacture and construction have been assessed and comply with the REACH European Legislation including the Sanitized® (triclosan free) hygiene function that is integrated into the gloves ensuring that the product is skin friendly.

### Cutguard™

Building on the technology contained in the EVOLUTION™ range, the grip, durability and cut resistance in the CUTGUARD™ range has been enhanced while the glove's impact on hand health has been reduced. The design and materials used allow for maximum freedom of movement and dexterity.



*Evolution Gloves – provide maximum hand protection and durability in the most rugged and physically-challenging work conditions.*

### Grippaz™

The latest innovative product to be added to the G. Fox offering is GRIPPAZ™, a range of semi-disposable gloves which have revolutionised both medical and work gloves around the world. In most applications, GRIPPAZ™ gloves are durable and comfortable enough to wear for the entire day. GRIPPAZ™ gloves are made with specialized formulations of tough and durable NBR (Nitrile Butadiene Rubber).

What separates this product from its competitors, is its patented fish scale grip pattern, embossed onto the

back, front external and internal surfaces of the gloves – making each GRIPPAZ™ glove ambidextrous. The exterior grip pattern provides excellent grip of the object being held, while the pattern on the inside of the gloves, provides traction, helping to prevent slippage against the skin and reducing sweating.

GRIPPAZ™ gloves are designed to fit snugly for maximum dexterity and comfort, with less hand fatigue. The gloves are both silicone and latex free, providing an excellent barrier against many chemicals, blood borne pathogens and viruses. No detail has been overlooked in the design of these gloves as they have also been designed to be fully touchscreen friendly.

These gloves are the perfect fit in industries involving paint, crafts, DIY projects, gardening, plumbing, building, cleaning, food preparation, manufacturing, and industrial use.

The GRIPPAZ range is divided into colours to easily match the appropriate glove to an application.

The blue range has been designed for the food and janitorial industry, while black and orange has been developed for industries dealing with dry, wet, or greasy conditions.

The GRIPPAZ™ gloves are available in a range of sizes from medium to XXL as well as in single pairs or boxes of twenty-five pairs.

## How to get the most out of your N95 mask or other respirator

ALTHOUGH mask mandates are being lifted in several countries, many people will continue to wear masks to protect themselves and others from the more transmissible Omicron variant. Any mask is better than none. However, a type of mask known as a respirator is more effective at preventing the spread of SARS-CoV-2 (the virus that causes COVID) than a cloth or surgical mask, provided you use it properly.

Here is a practical guide to getting the most out of your respirator.

### What is a respirator?

Respirators are designed to fit your face closely to help prevent you breathing in airborne particles through the gaps around the edges.

They are made of a plastic with an electrostatic charge that repels viral particles, preventing at least 95% of particles from getting through.

### Who can use a respirator?

Adults can use respirators but the US Food and Drug Administration (FDA) does not recommend them for children. That's because they are not designed for smaller face sizes so may not provide full protection. Facial hair, unfortunately, interferes with the fit. That's because the edge of the respirator cannot form a tight

seal around the face and chin.

### Which respirator is best?

This depends on personal preference and size. Try a few different types to find one that fits well. P2 respirators found in hardware stores are often in larger sizes that suit men. Chemists sell others that might better suit a smaller face.

Look for an adjustable nose piece and straps that go over the back of the head rather than loops that go over the ears. This will ensure a tighter fit.

Do not buy respirators with valves because they do not prevent the release of viral particles into the air.

### Watch out for counterfeits

Avoid a false sense of security when wearing respirators, as they won't have been professionally "fit tested" the way they would be for health workers.

When buying respirators online, look out for counterfeit products.

### Can I re-use them?

While respirators are labelled for single use, they can be reused outside health-care settings with care:

- the more you reuse a respirator the more likely it is to fail because the wear on the elastic straps causes a poorer fit or

components break. Most are good for at least five wears but some can go for at least 20

- have several on the go and alternate them on different days. Store each one after use in its own paper bag, to allow it to dry out between uses
- remove the respirator if it gets wet. When removing, touch only the straps. Move the respirator away from your face so you don't contaminate your skin or hair
- when the respirator loses its fit, gets damaged or has been used too often, pop it in the bin.

### What not to do:

- don't wash or microwave your respirator. This interferes with its electrostatic charge and ability to filter viruses
- don't store it in a plastic bag as it will not dry out between uses.

Respirators reduce the spread of SARS-CoV-2 but will not stop it alone. It is essential to stay home if unwell, get fully vaccinated, physically distance where possible, regularly wash or sanitise your hands, and if coughing or sneezing, do so into your elbow.

*Published recently in The Conversation.*

## 3S Positive Pressure Facemasks

THE 3S Positive Pressure Full-Face Mask from PSA is highly popular and available in more than 50 variations. All versions are designed to fit comfortably, with a wide sealing frame and deep chin stop. The lens provides excellent viewing and is either impact-resistant polycarbonate; silicate-coated glass or Triplex glass. The inner mask is fog-free and supplies optimal air flow. The harness



is designed for pressure-free easy use and works seamlessly with a protective helmet.

Facemasks are available in standard and small sizes coupled with several versions of harnesses including rubber, silicone, Nomex EZ-don with adapters for mask-helmet-combinations.

The 3S range also comes with a broad range of accessories including as a mask-helmet-combination.

*For more information visit: <https://psafrica.co.za/product/3s-positive-pressure-facemasks/>*

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## Jobs and growth still possible in maritime sector



SAIMI Project Manager Dr Tanaka Mugabe, SAIMI CEO Odwa Mtati and Buffalo City Maritime Cluster Secretariat Thabisa Sigwela.

THE South African International Maritime Institute (SAIMI) in collaboration with the Buffalo City Maritime Cluster (BCMC) has hosted a first-of-its-kind Maritime Industry Engagement focused on "Cluster Strategy and conferring collaborations and support". The hybrid event was hosted at the East London International Convention Centre recently.

Opening the event, SAIMI CEO Odwa Mtati said SAIMI was partnering with the six regional maritime clusters across South Africa to ensure a sustainable maritime sector. "The sector will only develop because we are all partners – it involves the efforts of many stakeholders interested in growing the maritime economy. Clusters succeed precisely because they have diverse interests – including those from industry, government, SMMEs, new entrants and academia," said Mtati.

Asked how mass employment like Operation Phakisa's potential projections of 1 million jobs by 2033 could be achieved, Oceans Economy Specialist Prof Stephen Hosking stated that "lots of small contributors add up to a big contribution. The challenge is for all parts of the model to get their prices right."

Hosking was responsible for calculating the ocean economy's contribution to GDP at 4.5% in a 2014 report commissioned by the President. "South Africa has a large ocean space available with an extensive natural resource inventory. The advantages of the oceans are numerous,

including lower cost of transport, communication, trade and global supply chains".

To grow jobs had always been an important part of Operation Phakisa, according to Hosking.

"Clusters can play an important role in exploiting local economies of scale. They facilitate positive local and global network development, minimise local regulatory and bureaucratic barriers, assist in penetration of global supply chains, and educate government and society on achieving local production competitiveness," said Hosking.

The Southampton, UK-based Marine South East International CEO Dr Jonathan Williams concurred that maritime clusters stimulate investment and act as catalysts for growth.

Sharing the lessons learned in cluster modelling from the UK, Williams said the focus had successfully been on innovation and responding to the market, identifying the missing capabilities and introducing small suppliers to customers.

"We have had a particular focus on entrepreneurs and the potential for clusters to help entrepreneurs to gain traction – introducing start-ups to wider business activity. Clusters promote collaboration, which leads to funding and access to funding and diversifying businesses in high-growth sectors," said Williams.

A Space2Waves virtual mission is also underway to build links between European SMMEs and South Africa SMMEs operating in the maritime sector.

## Robotic hull cleaning service expanded

NEPTUNE Robotics, founded in Hong Kong in 2018, is a fast-growing technology company specializing in robotic cleaning of ship hulls using advanced algorithms. Now based in Shenzhen, China's leading technological hub and the home of many technology giants like Tencent and DJI, the company has rapidly risen from an R&D startup to a well-established robotics company, with more than 60 in-house engineers and scientists.

In the last two years, Neptune has cleaned over 200 ships in the ports and anchorages of Guangzhou, Yantian and Shekou. Early adopters of their technology include CMA-CGM, COSCO and international ship management

companies, amongst others. Neptune's plan is to expand to all major ports and anchorages worldwide. Ship owners and operators know that even a small amount of marine growth on the hull and propeller can easily result in a 10 percent loss of speed due to increased friction, or, if speed is maintained, an increase in fuel consumption of 30 percent.

Neptune's robots offer significant advantages as they use cavitation waterjets to remove fouling with minimal loss of antifouling paint. The robots use advanced artificial intelligence to self-steer along the hull sides and bottom. Other major advantages include an ability to clean hulls above the waterline, to work at night, and to clean at berth while ships

are loading or discharging, avoiding any delays.

Most impressively, the robots can clean hulls in the muddy waters frequently found in Chinese river ports. The robots are fitted with powerful lights and cameras and stream the before and after cleaning performance to Neptune's cloud platform when operating in very muddy waters. Clever AI interprets the data to automatically produce a before and after cleaning report, providing details of the types of marine growth found on various areas of the hull.

Conventional hull scrubbing uses rotating brushes housed in a hydraulically powered cart steered by divers. There are significant drawbacks with this method. Maintaining

even pressure on the hull is difficult and the brushes often remove antifouling paint along with the marine growth, which reduces the coating's lifetime.

### Business case

Consider the case of a Capesize bulk carrier with a clean hull and propeller operating at an economical speed of 12 knots for 300 days per year, averaging 40 tons per day of fuel, using 12 000 tons per year for propulsion. If an increase in friction due to hull and propeller fouling reduces speed by 10 percent - down to 10.8 knots - it reduces earning days by 33 per year. Alternatively, if the speed is to be maintained at 12 knots, this increases fuel consumption by about 4 000 tons.

If the ship's charter hire is \$30 000 per day, the 33 lost sea days will cost \$1 million per year. If speed is maintained, the extra 4 000 tons of fuel needed to maintain 12 knots will cost \$3.6 million at \$900 per ton. Keeping vessels clean between dockings saves money and is common sense in the industry.

There are two basic methods to remove the build-up of marine growth on the hull and propeller. One is to drydock earlier than planned, and the second is to remove the biofouling while at berth or anchorage. The second method is far less expensive and avoids lengthy off-hire periods.

Visit: <https://neptune-robotics.com> for more information.

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# Resource nationalism and the metals crunch

THE 2022 CRU World Copper Conference in March was told miners needed to spend \$100 billion on new mines to counter a supply shortage likely to be around 4.7 million tons by 2030.

Critical minerals are used widely, including in mobile phones, flat screen monitors, wind turbines, electric cars, solar panels, and defence and other high-tech applications.

Australia has the world's third largest reserves of lithium and is the largest producer of lithium in the world.

It is ranked sixth in the world for rare earth elements and second for production and it has large resources of cobalt, manganese, tantalum, tungsten, and zirconium.

Lynas received a \$14.8 million grant through the \$2 billion Critical Minerals Fund to commercialise a new refining process that will be used at a new processing facility in Kalgoorlie, and Iluka Resources received \$1.2 billion of support to build

Australia's first fully-integrated rare earths refinery

IMDEX Chief Geoscientist Dave Lawie — who has raised concerns previously about resource nationalism and the capacity of the resources sector to find and mine enough of the minerals needed in a net-zero world — says the sector is now being hit by a confluence of world events.

“Just as COVID-19 exposed the fragility of supply chains, so the geopolitical ramifications of the invasion of Ukraine and the wide-ranging sanctions against Russia will have effects on how countries view their resources,” Dr Lawie said.

“You can expect to see some countries jealously guarding their deposits of future facing minerals, at the time some of the world's major mining companies are deciding it's time to explore their options in what until now have been considered risky mining jurisdictions.

“While hydrogen may be seen as the

answer to replacing fossil fuels and the energy source of the future, it can't be done without renewable power from solar and wind. And the components for those power plants can't be manufactured without a host of metals.”

Recent figures published by Western Australia's Department of Mines, Industry Regulation, and Safety, revealed that the State's resources sector achieved record sales of \$230 billion in 2021, driven by iron ore, gold, and lithium amid supply constraints and geopolitical uncertainty.

Countries at the bottom of the Fraser Institute table included Zimbabwe, the Democratic Republic of Congo, and parts of South and Central America, raising the issue of risk versus reward in searching for the next major deposits to replace depleted existing resources.

The US Geological Society recently added zinc and nickel to its list of critical minerals.

Dr Lawie said:

“Exploration of zinc has been under funded for maybe 20 years. A lot of the technical exploration methods we use in exploration don't see zinc very well and there are just less big world class deposits of zinc than there are copper and nickel.”

The Australian Government has doubled down on its support for the critical minerals and rare earths sector, announcing a 2022 Critical Minerals Strategy, which Prime Minister Scott Morrison said would support the growth of the sector.

Dr Lawie considers that finding and mining the metals and minerals required is getting harder and more expensive, and the jurisdictions in which companies may have to operate have questionable political and social systems.

“We can see the future but getting there means navigating a host of conflicting issues that could require fundamental reassessments of countries' approach to their resources,” he said.

# Growing a successful crop of female entrepreneurs in SA agriculture

IN the 2022 State of the Nation address, President Cyril Ramaphosa recognised the importance of supporting small-scale farmers and integrating them into value chains.

A recent Sustainability Initiative of South Africa (SIZA) study on gender equality in the South African agriculture sector found that perception is still a major problem in South Africa's sprawling agriculture industry. The study revealed that women who work in agriculture still battle with the perception that farming is a 'man's job.'

With female unemployment at a record high of 48.7%, there is opportunity for women to harvest a new future for themselves through agriculture, and in turn, grow the South African economy. Even then, the reality is that 35% of female farmers in South Africa find that their income from farming does not cover the needs of their family. But should being able to feed one's family be the extent of a female farmer's aspirations? Can they not break the cycle, grow a flourishing business and create sustainable jobs for their communities?

The Momentum Metropolitan Foundation (MMF) has partnered with Agri Enterprises to launch the Women in Farming programme. This three-year incubator aims to enhance the skills of female farmers to enable and empower them to better feed their families and create jobs for their communities.

Starting in Kwa-Zulu-Natal, the pro-

gramme will see 60 female entrepreneurs participate in a business pitch approach to provide them with an opportunity to sell their agriculture business ideas to a panel of industry experts headed by the CEO of Agri Enterprises, Omri van Zyl. Selected entrepreneurs will be trained and mentored by the Agri Enterprises Sustainability and Rural Development Division in Woodberg, Pietermaritzburg.

The Agri Enterprises Sustainability and Rural Development Division focuses on providing scarce skills along the broader agricultural value chain. Sulaimaan Patel Head of Rural Development and Social Investment at Agri Enterprises says the academy has adopted a Comprehensive Mentorship Approach (CMATM), offering training from a technical level right up to an executive strategic level. “We firmly believe this approach creates innovative entrepreneurs within the agriculture value chain,” says Patel.

Agri Enterprises' four-step approach to entrepreneurial development includes:

The Innovation Station – developing criteria to identify potential business ventures within the agricultural industry.

Business Incubation – equipping individuals with financial, entrepreneurial, and relevant business skills.

Start-up Business – mentoring and supporting in how to launch a business successfully.

Agri-preneurial development – providing high-level train-

ing to allow continued growth through training programmes aligned with finances, governance, project management, and strategy.

Nkosinathi Mahlangu Youth Employment Portfolio Head from MMF says agriculture is the perfect sector to kickstart gender equality in the South African economy. “Millions of women living in rural and remote areas sit on the side-lines of our economy. As agriculture relies on our country's rural communities, transforming this sector into one that is more inclusive can address our high unemployment rate, ensure food security, and improve farming innovation at the same time.”

The programme and its partners are currently fielding applications in order for the 60 participants to be identified. All-in-all, hundreds of business proposals are to be heard and will be whittled down to a chosen batch of 60.

The 60 entrepreneurs will come from various parts of the agricultural value chain with a strict focus on limited sectors within agriculture to ensure the programme remains focused.

“We believe by giving women the tools, advice and experiences, we can empower them to be unstoppable in their pursuit of success. Through agriculture, we have an opportunity to empower African women by equipping them with entrepreneurial skills to start their own businesses,” concludes Mahlangu.



# Freedom to learn: Why distance learning is changing the game

By Eloise Nolte, MD of Optimi College



OVER the last few decades, our country has come a long way. Literacy rates have increased from 82.4% to 95%, according to data from UNESCO. In 1994, 58% of pub-

lic-school learners in Grade 12 passed matric, while in 2021 that figure was 76.4%.

At the same time, we have huge challenges, including an unemployment rate that has accelerated to 35% amid the COVID-19 pandemic.

To address this, we need to do everything we can to upskill our citizens, using every means possible.

Fortunately, education and technology have come a long way in the last 28 years — and distance learning provides a meaningful way to help South Africans, of any age, get ahead with accredited qualifications and short courses. Here are 5 reasons why:

## Learning from anywhere, at anytime

There are many education providers that work on a distance learning model where you can study anything from accounting to IT, software development, supply chain management and much more without ever needing to attend face-to-face classes.

Study material can be delivered straight to your door, and you can start studying immediately, at any point in the year.

With petrol prices increasing, this saves you money and travel time. If you have a full-time job, you don't have to plan your after-work time around classes or rushing to attend

classes in the evenings.

## Less restrictive entry requirements

Distance learning institutions typically have courses that suit many different people with different educational backgrounds.

There are courses that range from provider to accredited programmes, which offer entry level courses that only require a Grade 10 or 11.

If you're older than 21 and you'd like to complete your matric, you can do this by studying towards Adult Matric, or the Amended Senior Certificate (ASC). This qualification can help with getting into tertiary education as well, as long

as you meet the requisite requirements.

## More manageable

Many distance learning institutions allow you to study only a few subjects at a time. Apart from the financial benefit, colleges do this so that students don't feel overwhelmed by the workload.

Even if you have enrolled for a few subjects, the likes of College SA, sends your course material in batches.

This is done so that you can complete a module and its assignments before moving on to the next module. This further allows you the opportunity to focus on one thing at a time –

making it easier to fully understand your course material and attend to your other responsibilities.

## Online study groups and forums

Many distance learning institutions will also have online study groups and discussion forums, where you can interact with fellow students and tutors, discuss course material, and ask for help.

## Affordable payment options

By eliminating the extra costs that go along with studying, you only have to pay the tuition fees with a distance learning provider. You can

pay your studies off in easy to manage monthly instalments, or study and pay for one subject at a time.

These costs can include your study material which means you don't have to spend money on buying textbooks. In addition, in today's world there are also many study financing providers who can help learners with funding their studies.

When taking all these benefits into consideration, it's clear that, more than ever, South Africans have the freedom to structure their own study time, schedule and pace of learning.

To find out more, visit [www.collegesa.edu.za](http://www.collegesa.edu.za)

# Researchers take step toward developing ‘electric eye’

By Georgia State University

GEORGIA State University researchers have successfully designed a new type of artificial vision device that incorporates a novel vertical stacking architecture and allows for greater depth of colour recognition and scalability on a micro-level. The new research is published in the top journal ACS Nano.

“This work is the first step toward our final destination—to develop a micro-scale camera for microrobots,” says assistant professor of Physics Sidong Lei, who led the research. “We illustrate the fundamental principle and feasibility to construct this new type of image sensor with emphasis on miniaturization.”

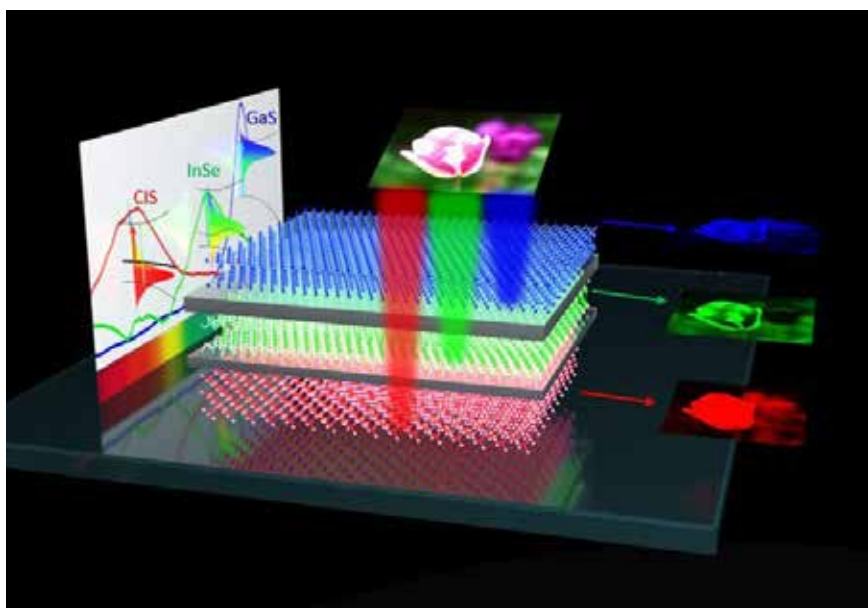
Lei’s team was able to lay the groundwork for the biomimetic artificial vision device, which uses synthetic methods to mimic biochemical processes, using nanotechnology.

“It is well-known that more than 80 percent of the information is captured by vision in research, industry, medication, and our daily life,” he says. “The ultimate purpose of our research is to develop a micro-scale camera for micro-robots that can enter narrow spaces that are intangible by current means, and open up new horizons in medical diagnosis, environmental study, manufacturing, archaeology, and many more.”

This biomimetic “electric eye” advances colour recognition, the most critical vision function, which is missed in the current research due to the difficulty of downscaling the prevailing colour sensing devices. Conventional colour sensors typically adopt a lateral colour sensing channel layout and consume a large amount of physical space and offer less accurate colour detection.

Lei and his team developed the unique stacking technique which offers a novel approach to the hardware design. He says the van der Waals semiconductor-empowered vertical colour sensing structure offers precise colour recognition capability which can simplify the design of the optical lens system for the downscaling of the artificial vision systems.

Ningxin Li, a graduate student in Dr. Lei’s Functional Materials Studio who



The newly designed structure created by Georgia State researchers shows the working principle and device structure in 3-D. Credit: Graphic image from research team

was part of the research team, says recent advancements in technology make the new design possible.

“The new functionality achieved in our image sensor architecture all depends on the rapid progress of van der Waals semiconductors during recent years,” says Li. “Compared with conventional semiconductors, such as silicon, we can precisely control the van der Waals material band structure, thickness, and other critical parameters to sense the red, green, and blue colours.”

The van der Waals semiconductors empowered vertical colour sensor (vdW-Ss) represent a newly-emerged class of materials, in which individual atomic layers are bonded by weak van der Waals forces. They constitute one of the most prominent platforms for discovering new physics and designing next-generation devices.

“The ultra-thinness, mechanical flexibility, and chemical stability of these new semiconductor materials allow us to stack them in arbitrary orders. So, we are actually introducing a three-dimensional integration strategy in contrast to the current planar micro-electronics layout. The higher integration density is the main reason why our device architecture

can accelerate the downscaling of cameras,” Li says.

The technology currently is patent pending with Georgia State’s Office of Technology Transfer & Commercialization (OTTC). OTTC anticipates this new design will be of high interest to certain industry partners. “This technology has the potential to overcome some of the key drawbacks seen with current sensors, says OTTC’s Director, Cliff Michaels. “As nanotechnology advances and devices become more compact, these smaller, highly sensitive colour sensors will be incredibly useful.”

Researchers believe the discovery could even spawn advancements to help the vision-impaired one day.

“This technology is crucial for the development of biomimetic electronic eyes and also other neuromorphic prosthetic devices,” says Li. “High-quality colour sensing and image recognition function may bring new possibilities of colourful item perception for the visually impaired in the future.”

Lei says his team will continue pushing these advanced technologies forward using what they’ve learned from this discovery.

# A promising method to produce fibre batteries on an industrial scale

By Ingrid Fadelli, Phys.org

FIBRE batteries are millimeter-thin batteries based on fibres that can be woven into items of clothing or used to create highly flexible, wearable electronics. In recent years, many research teams worldwide have been trying to fabricate these batteries, using a range of different techniques and approaches.

Most existing techniques for creating fibre batteries entail layer-by-layer coating processes that were adapted from the fabrication of planar batteries, a flat and thin battery technology. Despite their advantages, these processes typically enable the creation of a limited number of batteries at a time, thus they are unsuited for large-scale production.

Researchers at Fudan University in China have recently introduced an alternative method for manufacturing

fibre batteries that could be easier to implement on an industrial scale. This method, introduced in a paper published in Nature Nanotechnology, is based on a general, solution-extrusion technique that can produce batches of several fibre batteries in a single step.

The production method proposed by the researchers relies on a spinneret structure, a cap or plate with several small holes on it that is often used to produce fibres.

This structure, which has three main extrusion channels, can be used to create fibre batteries composed of a parallel cathode and anode, encapsulated by an electrolyte, with remarkable production rates of 250 m h<sup>-1</sup>.

“Our three-channel industrial spinneret simultaneously extrudes and combines the electrodes and electrolytes of fibre batteries at high production rates,” Meng Liao and his colleagues

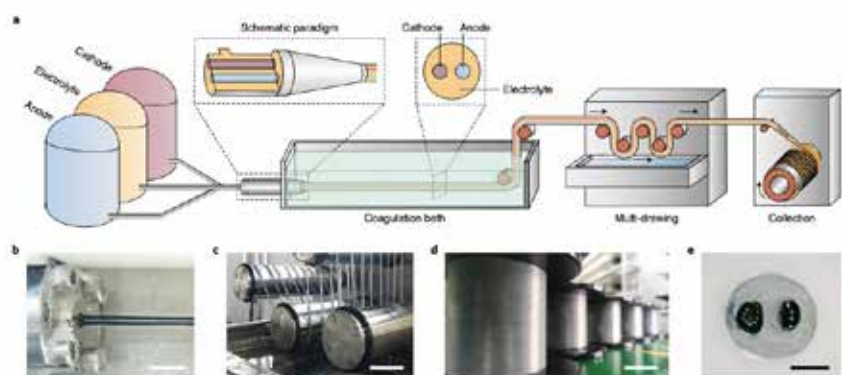
explained in their paper. “The laminar flow between functional components guarantees their seamless interfaces during extrusion.”

Compared to existing methods for producing fibre batteries, the researchers’ approach can yield a remarkable 1 500 km of continuous fibre batteries for each individual spinneret unit used. This is over three times more batteries than those produced by the best performing techniques developed so far.

In their paper, Liao and his colleagues demonstrated the high potential of their method by using it to create roughly 10 m<sup>2</sup> of fibre battery-based woven textiles. These textiles were specifically designed to be used to create smart and responsive tents and the fibre battery used to power them had an energy density of 550mWhm<sup>-2</sup>.

The smart tent they designed has several interesting and advanced features. For instance, it can harvest energy from the sun, store it, and use it to control a display and other technologies inside it. In the future, the battery production method introduced by the researchers could be used to create similar tents or other textile-based electronics on a large scale, potentially facilitating their widespread use.

“Our method is straightforward, and the flexible textile battery obtained is stable, durable and safe,” Liao and his colleagues wrote in their paper. “We anticipate that it will promote large-scale production and practical applications of fibre batteries for the next-generation electronics.”



Extrusion process and structural characterization of fibre batteries. Credit: Liao et al.

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# Yes, Eskom is the ANC's mess

WINTER was in the air, driving the confederacy of convivial conversationalists inside to our regular corner at the local Pub and Grill, to address the problems of our village, the nation and the world. Admittedly, some in our company failed to grasp the gravity of the occasion.

"Howzit!" hollered Luke the Dude. "Don't you even have drinks yet? My my, is The Governor slipping up or am I embarrassingly early?"

"Useless!" greeted Jon the Joker. "Not early at all, Lucas, not early. But yes, embarrassing!" This gave our sweet bartender the opportunity to serve the orders, complete with Luke's own large draught. "Cheers to good service!" toasted Stevie the Poet, and so cheered all of us.

"Please, ladies, gentlemen and, with respect, others, let's not get started on Russia's butchery-in-plain-sight," requested The Prof, "we have enough home-hatched crimes in our local kakistocracy."

"Which crime springs to mind, Prof?" enquired Miss Lily charmingly.

"To me," obliged The Prof, "the most dangerous is the long-continuing raping and pillaging of Eskom, aided and abetted by corruption and sabotage. As I speak, André de Ruyter's best efforts to salvage something from the wreckage are being sabotaged by felonious operators, ranging from cabinet ministers to petty gangsters."

"Draw me another lager," ordered Big Ben, "The Prof is making me nervous; it can't be that bad."

"Useless!" differed Jon the Joker. "Make that another round!"

"On the contrary, Ben," seconded Bill the Beard. "It is indeed that bad – spelling it out will exercise more than your nerves."

"What makes it worse," worried Irene the Queen, "is that the alarm bells have been ringing since the blackouts in 2008. This has

been getting worse for 14 years."

"If only that were true," sighed Bill the Beard. "To grasp the full extent of the ANC's culpability, we have to go back to 1994, when the April elections transferred power to the ANC. That was 28 years ago."

"I do not agree," argued Big Ben. "In 1994 Eskom was a world-class utility, admired for its expertise in producing ample electricity reliably and cheaply. So, what are you complaining about?"

"Useless!" agitated Jon the Joker. "What indeed! Thanks to the ANC, Eskom now produces too little electricity unreliably and at sky-high prices."

"Quite right," continued the bearded Bill, "Ben is correct about the success of Eskom in and before the nineties. It is also true that the mothballing of power stations began before 1994. But the transition brought developments that changed the facts. Firstly, South Africa was no longer being boycotted by most of the world and industrialisation resumed on steroids – rapidly increasing electricity demand. Secondly, the ANC stepped up electrification at a massive rate – which was admirable – raising the demand further and faster. So what would you expect Government as the only shareholder of Eskom to do?"

"Start building power stations, I should think," ventured Miss Lily. "Prepare to meet the rising demand with more electricity."

"Elementary, my dear Watson," agreed Bill. "But what did the ANC do instead? Decided that Eskom under the Nats produced too much electricity. So they mothballed a number of power stations, reducing supply in the face of fast rising demand. With easily predictable results."

"They were given expert advice that they were heading for trouble," remarked Stevie the Poet, "but did they take any notice? Naaah."

"At the same time," Bill held forth, "and at a quickening pace when Thabo Mbeki became president, the ANC enforced their policies of cadre deployment and affirmative action way beyond the boundaries of racism, steadily replacing the world-class experts who had made Eskom great with ANC employees."

"Power stations such as Camden were meanwhile recommissioned to address the ever-rising demand, but by Black Friday, 25 January 2008, Government declared a national electricity emergency. The next year, in May 2009, the Zuma presidency hit the fan and the era of state capture, with ballooning looting and corruption, invaded South Africa and divided the ANC."

"We've seen what that can do in July last year, when one ANC faction instigated an insurrection against the other – wiping more than R50-billion off the economy, in the words of President Cyril Ramaphosa, and destroying the jobs of nearly two million people."

"Meantime," reminded Stevie, after hundreds of billions and 14 years of organised crime, corruption, incompetence and wilful destruction, the 'new' blackout banishers Medupi and Kusile are still hobbling along on crutches."

"Then last month," contributed The Prof, "we saw the spectacle of the Parliamentary Standing Committee on Public Accounts, Scopa, summoning the recently appointed board members and the CEO of Eskom, André de Ruyter – formerly CEO of Nampak and Senior Group Executive: Operations of Sasol – to face the music."

"Chairing the ANC-dominated meeting looking for someone else to blame, was the singularly clueless IFP MP Mkhuleko Hlengwa."

"As we've seen, Eskom board member Buisiwe Mavuso spoke her mind. 'What we will not accept,' she said, 'is to have this board

## OPINION

### ON THE CONTRARY

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

Pieter Schoombee



and André as the fall guy for the mess that this organisation is currently experiencing; because the reality of the matter is that this is not our mess. We have been brought in to clean it up ... We cannot be the fall guy for this ANC-led government."

"Hlengwa responded by losing his cool. An ANC voice complained that they did not come there to be insulted, to which Mavuso responded, 'It's not an insult, it's facts'. And to another who asked, what is facts, she confirmed 'that this is the mess of the ANC-led government'. Hlengwa scolded her to either 'behave yourself' or leave."

"Of course, she excused herself and left. And later, after listening to the wiser counsel of the IFP leadership, Hlengwa apologised to her. By then the DA was already calling on the Speaker of Parliament to take action against Hlengwa for HIS behaviour."

"That was not the end of it, but I believe we can safely agree with Ms. Mavuso that Eskom's mess is indeed the ANC's mess."

Big Ben objected, but with glasses high, the convivial comrades cheered to Give That Prof a Bell's.

E-mail: noag@maxitec.co.za

# Strong tides, vanishing lakes may prove beneficial to Antarctic ice shelf

By Francisco Tutella, Pennsylvania State University

THE lakes that form on Antarctica's ice shelves can drive vertical cracks deep within the ice, increasing the chance of ice shelf collapse and sea level rise. However, if meltwater accumulates in certain areas and drains fast enough, it may temporarily stabilize the ice shelf despite increased warming, according to researchers.

"Antarctica's ice is the largest potential source of sea level rise," said Luke Trusel, assistant professor of geography at Penn State. "A significant percentage of the global population lives along the coastline in many of the world's largest cities. We need to understand what is happening to ice shelves to make reliable sea level predictions. Water can destabilize ice shelves, so we need to know where the water is and what it's doing."

Trusel and his colleagues used satellite data to study a meltwater lake that forms annually at the grounding line of the Amery Ice Shelf in East Antarctica. The grounding line is a zone where land ice transitions to a floating ice shelf that prevents the land ice from flowing into the ocean and raising sea levels. The ice in this area tends to dip and form a basin that could collect water.

The researchers found that strong tidal

activity may facilitate water-induced fracturing, or hydrofracturing, at the grounding line and cause the meltwater lake to drain quickly, often in as little as several days. The rapid draining prevents more water from accumulating and spreading onto the ice shelf, where hydrofracturing would raise the potential for collapse. The team reported their findings, which are the first observations of tides potentially forcing large-scale lake drainage, in *Geophysical Research Letters*.

The lake is approximately 3.7 square kilometres and 20m deep and contains almost 22 billion litres of water, enough water to fill nearly 7 200 Olympic-sized swimming pools, according to the researchers.

"It's not the biggest lake, but it's appreciable in terms of its size," Trusel said. "The more interesting aspect is the dynamics, how the water is changing so quickly and what that may mean for our understanding of ice shelf stability. A large volume of water is just disappearing, and it's doing this almost every year."

The researchers also examined high resolution satellite imagery taken after a drainage event. The images showed the lake bottom, where the team found a 8m deep and 244m-wide crater, ice blocks that would have fit inside the crater and a more than 640m-long fracture. These details indicate that the water most likely drained vertically,

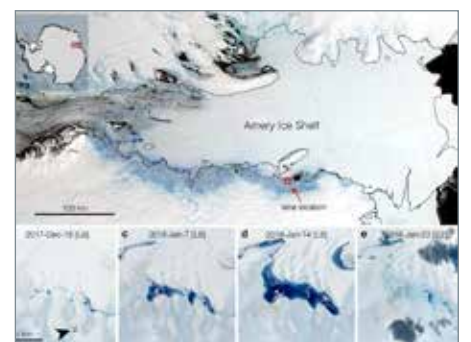
roughly 610m through the ice.

"This is the most detailed view of a freshly drained lake in Antarctica we've ever had," said Trusel, noting that the features they spotted had only previously been observed on the much warmer and wetter Greenland Ice Sheet.

Earth experiences stronger tidal activity when the Earth, moon and sun align, Trusel said. Because they float in the ocean, ice shelves are subject to tidal activity. Higher high tides force the ice shelf to flex up and generate stresses at the base of the ice that could cause a fracture. Lower low tides force the ice shelf to flex downward, transferring those stresses to the surface of the ice and potentially extending the fracture. The weight of the water at the surface could cause the fracture to propagate through the ice shelf until an opening forms and drains the lake.

"The tides flex the ice shelf at the grounding line," said Trusel. "The ice is acting like a door hinge, with stresses occurring at the top and bottom of the ice right where this lake exists."

"Revisiting observations from older aerial imagery and satellite data, we see that much of this water has been around for some time, and so there's more nuance here," Trusel said. "Water and ice can in some instances coexist. There's more we need to know about



A meltwater lake at the grounding line of the Amery Ice Shelf, East Antarctica. The time series at the bottom shows the lake filling then abruptly draining. A Penn State-led research team noted the first observations of tidal activity potentially forcing large-scale lake drainage, which may temporarily promote ice shelf stability despite increased warming. Credit: *Geophysical Research Letters* (2022). DOI: 10.1029/2021GL095661

how exactly it impacts ice shelf stability."

The scientists' next step is to investigate whether other lakes in the region drain as a result of tidal activity. The current study raises many questions, Trusel said, but it represents the latest step to better understanding ice shelf stability and how fast seas will rise in the future.