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INSIGHTS 2021

Welcome to the 2021 Insights issue where we've asked industry leaders to provide you with their views on what challenges and opportunities lie ahead. The issue combines content from three magazines in one — Process Technology, Sustainability Matters and ECD.

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GOING IT ALONE

Glenn Johnson, Editor, Process Technology

The past year has shown clearly the need for local sustainable manufacturing and energy self-sufficiency.

Over the last seven years there has been no clear and consistent direction on energy policy from the federal government — with debates on the subject anything but non-partisan — making it no surprise that state governments have been left to fill the policy vacuum.

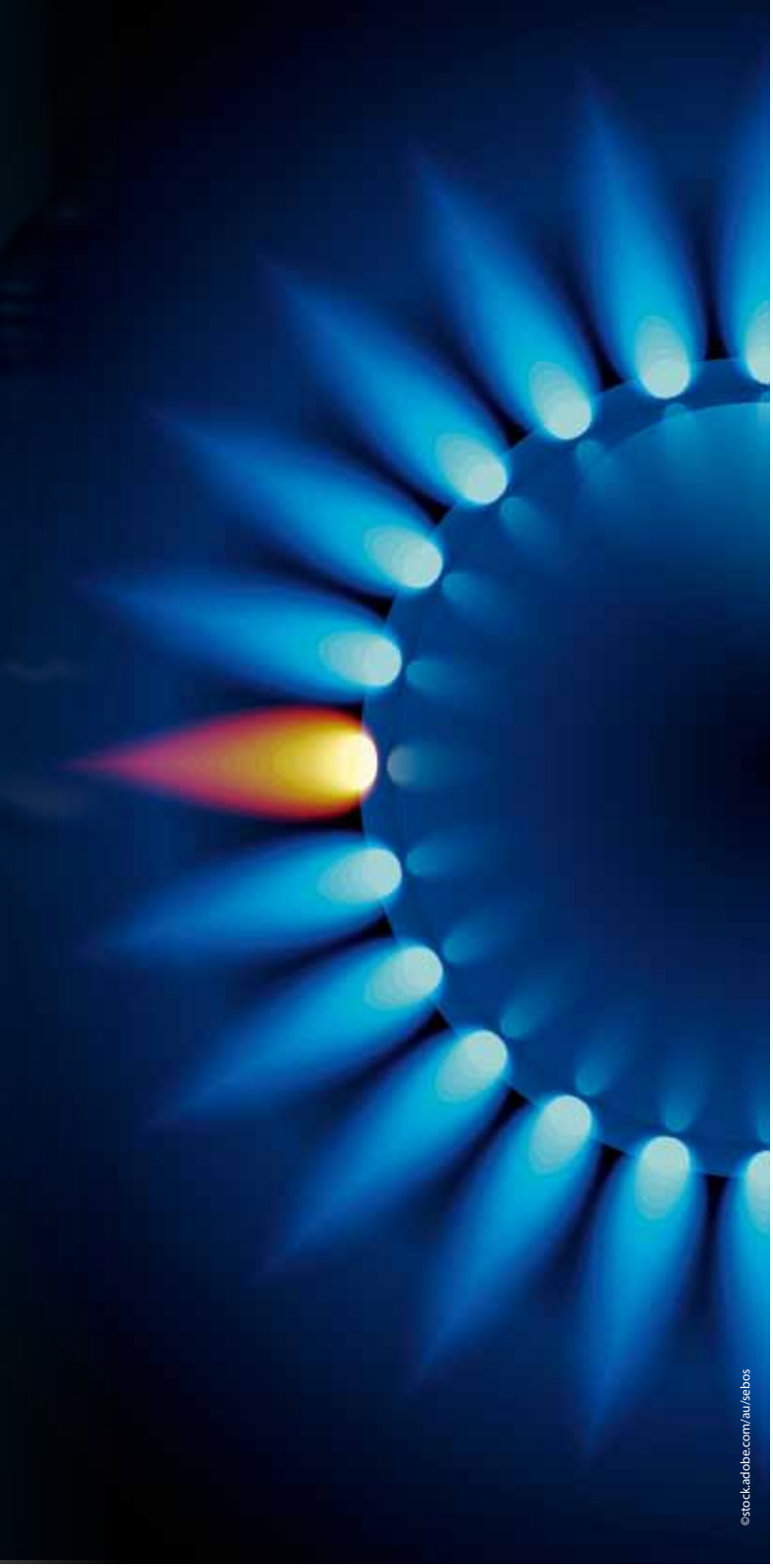
Renewable roadmap for NSW

In NSW there have been mixed responses to the state government's recent announcement of its Electricity Infrastructure Roadmap. It is an ambitious plan outlining new support for NSW Renewable Energy Zones by 2030, with policy and financial support for renewable energy and battery storage projects. While the roadmap has been acclaimed by several key organisations, concerns have also been expressed by the Australian Energy Council (AEC).

The AEC is concerned about the potential to undermine national integrated system planning and distort investment signals in the National Electricity Market (NEM), which it claims could ultimately lead to higher costs. In an announcement emotively titled 'NSW Electricity Infrastructure Roadmap: A highway to hell?'[1] the AEC says the roadmap has the potential to detract from the national market framework and hinder its ability to deliver efficient outcomes for consumers.

Some of the AEC concerns include being state-centric and failing to exploit the efficiencies of national trade; having over-investment in generation resources frequently justified by excessive reliability standards; and having inconsistency of policy, responsibilities and approach between states, and between states and the Commonwealth.

According to the NSW Government[2], its planned approach to transmission, generation and storage will deliver approximately 12 GW of new transmission capacity through the Central-West Orana, New England and South West Renewable Energy Zones by 2030 and support an estimated 3 GW of new firm capacity in the NSW grid by 2030, and contribute to the NSW Government's Net Zero Plan by delivering 90 million tonnes of reduced carbon emissions by 2030.



The reasoning behind the energy plan is that "within 15 years, three quarters of (the) State's electricity supply is expected to reach the end of its technical life. Replacing these energy sources and building the infrastructure needed to connect them to...homes and businesses will take years. Action is needed now to ensure NSW consumers have continued access to cheap, clean and reliable electricity."

Three out of five of the coal-fired power stations in NSW are scheduled to close by 2033 (Liddell in 2022, Vales Point B in 2028 and Eraring in 2032), with the Bayswater station to close soon after. The maximum output of the currently active coal-fired power stations is about 9.9 GW.

The state government says that in acting on the plan, it could set NSW up "to be a global energy superpower".

It is also claimed the plan will result in an estimated $32 billion in private investment to 2030 and support an estimated 6300 construction jobs and 2800 ongoing jobs, mostly in regional NSW in 2030, which has been welcomed by both environmental groups and energy investors, and it has secured bipartisan support in the NSW Parliament, with the Liberal, Labour and National parties all in support of the plan.

South Australia leading the way

The clearest example of states going it alone has been the experience of the South Australian Government. In May 2016 the state's last coal-fired station in Port Augusta was shut down, but in the same year the state was struck by a major state-wide blackout after a severe storm took out major transmission infrastructure. The blackout sparked a flurry of claims and counterclaims between state and federal governments, as well as partisans in both the fossil fuel and renewable energy sectors. The proponents of coal and gas power on the right of politics presented it as a failure of renewable energy to be reliable, despite the main failure being the transmission network itself.

The SA Government's response was to build a gas-fired power plant and build what was then the world's largest battery — at 100 MW capacity — before the end of 2017, in order to stabilise the network. It is difficult to find any details, however, of whether the transmission network itself has been reinforced with any additional redundancy to counter such events as the 2016 storm should they occur in the future.

Currently SA is planning to close both its thermal gas power stations at Torrens Island in the coming year and has considerable future renewable expansion plans. Currently there are 2.1 GW of wind power, to be expanded to 3.5 GW, 362 MW of solar to be expanded to 6.1 GW and 165 MW of storage to be expanded to 4.8 GW. The expansion projects are coming at a cost of around $21–25 billion, and these projects are more than enough to take SA to its net 100% renewables target by 2030.

Like NSW, the policy of renewable energy transition has had bipartisan political support, and South Australia now ranks number two in the world — behind Denmark — in total share of electricity generated from 'variable' sources.

Victoria wants an even bigger battery

Not to be outdone, the Victorian Government has awarded a contract to supply an even bigger battery than the Hornsdale Power Reserve in SA. French renewable energy developer Neoen will build what will become the world's biggest battery at 300 MW in Geelong.

Like Hornsdale, the new Victorian battery will also be built by Tesla, but in this case using the new 3 MWh Megapacks, which Tesla says can deliver a major peaking plant four times quicker than traditional fossil fuel projects.

The battery's primary role will be to participate in Victoria's System Integrated Protection Scheme, which like the Hornsdale battery will put it at the front line of providing grid security, thanks to the battery's speed and flexibility, and allow for an increase in operating capacity on the main transmission link between Victoria and NSW. It is expected to be operational by the end of 2021.

The Australian Energy Market Operator (AEMO) says the battery will provide an additional 250 MW of peak capacity on the existing Victoria to New South Wales Interconnector (VNI) over the next decade of Australian summers, reduce the amount of 'unserved energy' and deliver total benefits of more than $220 million to Victoria consumers.

A boost for local industry after COVID-19

At the same time as announcing its Electricity Infrastructure Roadmap, the NSW Government also announced a Manufacturing Renewables Taskforce[3] "to find ways to drive the use of NSW materials in building the State's Renewable Energy Zones". The biggest target of this announcement is the steel industry.

"We currently import the more than 86,500 tonnes of steel that form the foundations for critical energy infrastructure — including some finished manufactured goods," said Deputy Premier John Barilaro. "As we come out of this recession, we need to lead by example by backing our local supply chains, local manufacturers and local jobs.

"This taskforce will make sure we have the knowledge we need to do just that, and unlock regional NSW's renewable energy manufacturing potential."

It is estimated that the development of the Renewable Energy Zones will require an additional 650,000 tonnes of steel, and the government wants to find ways of making sure that the steel is manufactured in NSW by local companies. The Manufacturing Renewables Taskforce will include representatives from the steel, aluminium, cement, concrete and manufacturing industries, the workers unions, renewable development stakeholder groups and the NSW Government.

The Clean Energy Council has welcomed the announcement of the taskforce[4], saying it "is the right place to begin, enabling thorough analysis of the natural advantages and strengths of existing local supply chains to meet the needs of a significant renewable energy build".

Steelmaker BlueScope has already committed to the plan, with the announcement of a $20 million investment[5]. The investment includes investing $10 million directly in its Port Kembla steelworks to tool up for the expected growth in production, with the other half to be used as an incentive program for "companies who want to build manufacturing capability in NSW, especially in the fast-growing renewable energy sector".

"An immediate focus will be supporting the manufacture of wind tower, solar farm, pumped hydro and electricity transmission facilities. There is large and growing demand for all these equipment types which, in NSW, are currently imported as prefabricated finished goods," said BlueScope Managing Director and CEO Mark Vassella.

Out of challenges come opportunities

The COVID-19 pandemic and the resulting border closures — not to mention an ongoing trade dispute with China — serve to highlight the need for local sustainable manufacturing and energy self-sufficiency. Whatever the arguments against the announced state investments, Australia has been lucky enough to have recently enjoyed a long period of sustained economic growth prior to 2020. This has left states such as NSW, Victoria and South Australia in a position to afford to invest in a sustainable energy future, while maintaining support for a local manufacturing base. The dramatic events of 2020 may well have been a blessing in disguise when it comes to Australian manufacturing and climate leadership.

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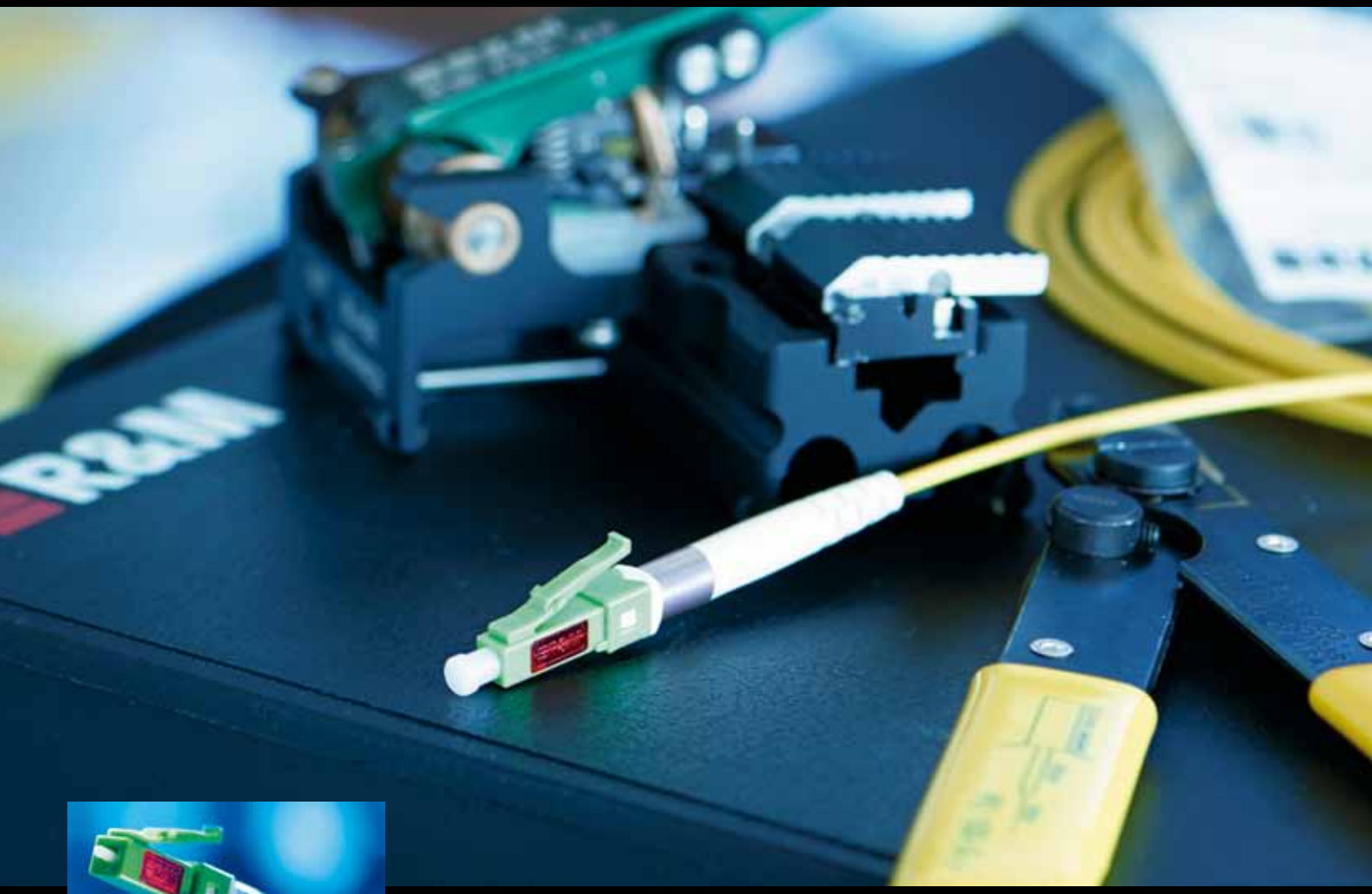

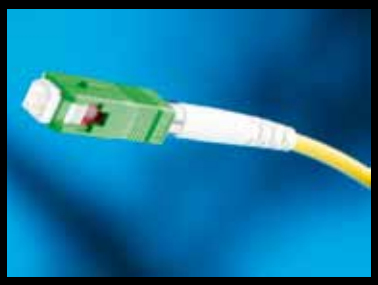

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CAPTURING AND STORING SOLAR ENERGY FOR LATER USE

A molecule that absorbs energy from sunlight and stores it in chemical bonds has been developed by researchers at Linköping University (LiU), Sweden.

It is thought that, in the long term, this molecule could be used to capture solar energy efficiently and store it for later consumption. The researchers' results have been published in the *Journal of the American Chemical Society*.

One of the challenges of solar energy is to store it efficiently, and enable its use when the sun is not shining.

"Our molecule can take on two different forms: a parent form that can absorb energy from sunlight, and an alternative form in which the structure of the parent form has been changed and become much more energy-rich, while remaining stable. This makes it possible to store the energy in sunlight in the molecule efficiently," said study leader Bo Durbeej, Professor of Computational Physics in the Department of Physics, Chemistry and Biology at Linköping University.

The molecule belongs to a group known as 'molecular photoswitches'. These are always available in two different forms — isomers — which differ in their chemical structures. The two forms have different properties — in the case of the molecule developed by the LiU researchers, this difference is in the energy content. The chemical structures of all photoswitches are influenced by light energy. This means that the structure, and thus the properties, of a photoswitch can be changed by illuminating it. One possible area of application for photoswitches is molecular electronics, in which the two forms of the molecule have different electrical conductivities. Another area is photopharmacology, in which one form of the molecule is pharmacologically active and can bind to a specific target protein in the body, while the other form is inactive.

Advanced computer simulations showed that the molecule the researchers had developed would undergo the chemical reaction they required, and that it would take place extremely fast — within 200 femtoseconds. Their colleagues at the Research Centre for Natural Sciences in Hungary were then able to build the molecule and perform experiments that confirmed the theoretical prediction.

In order to store large amounts of solar energy in the molecule, the researchers have attempted to make the energy difference between the two isomers as large as possible. The parent form of their molecule is extremely stable — a property that within organic chemistry is denoted by saying that the molecule is 'aromatic'. The basic molecule consists of three rings, each of which is aromatic. When it absorbs light, however, the aromaticity is lost, such that the molecule becomes much more energy-rich. The LiU researchers show in their study that the concept of switching between aromatic and non-aromatic states of a molecule shows major potential in the field of molecular photoswitches.

"Most chemical reactions start in a condition where a molecule has high energy and subsequently passes to one with a low energy. Here, we do the opposite — a molecule that has low energy becomes one with high energy. We would expect this to be difficult, but we have shown that it is possible for such a reaction to take place both rapidly and efficiently," said Prof Durbeej.

The researchers will now examine how the stored energy can best be released from the energy-rich form of the molecule.

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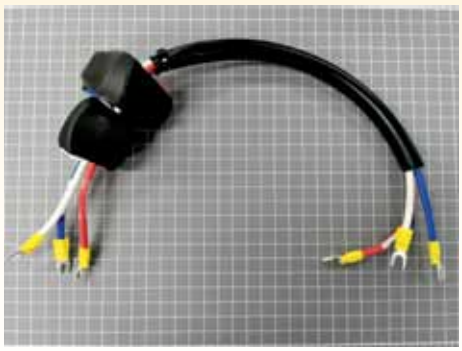

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Vertical urban farm for Sydney's CBD

Charter Hall Group has partnered with Urban Green Sydney to incorporate a large vertical urban farm at its 1 Shelley Street office tower, which is home to Macquarie Group.

Installed in the building's 1000 m^2 basement space, the vertical farm will produce over 30 different varieties and 4000 punnets of microgreens a week. At approximately 20 g per punnet, this will result in around 80 kg of microgreens being grown per week (or 4160 kg/yr). Furthermore, it uses up to 95% less water than traditional farms.

Charter Hall's Managing Director and Group CEO, David Harrison, said: "It's fantastic to partner with such an inventive and forward-thinking business like Urban Green Sydney, and I'm excited to have them join our tenant customer community at 1 Shelley Street.

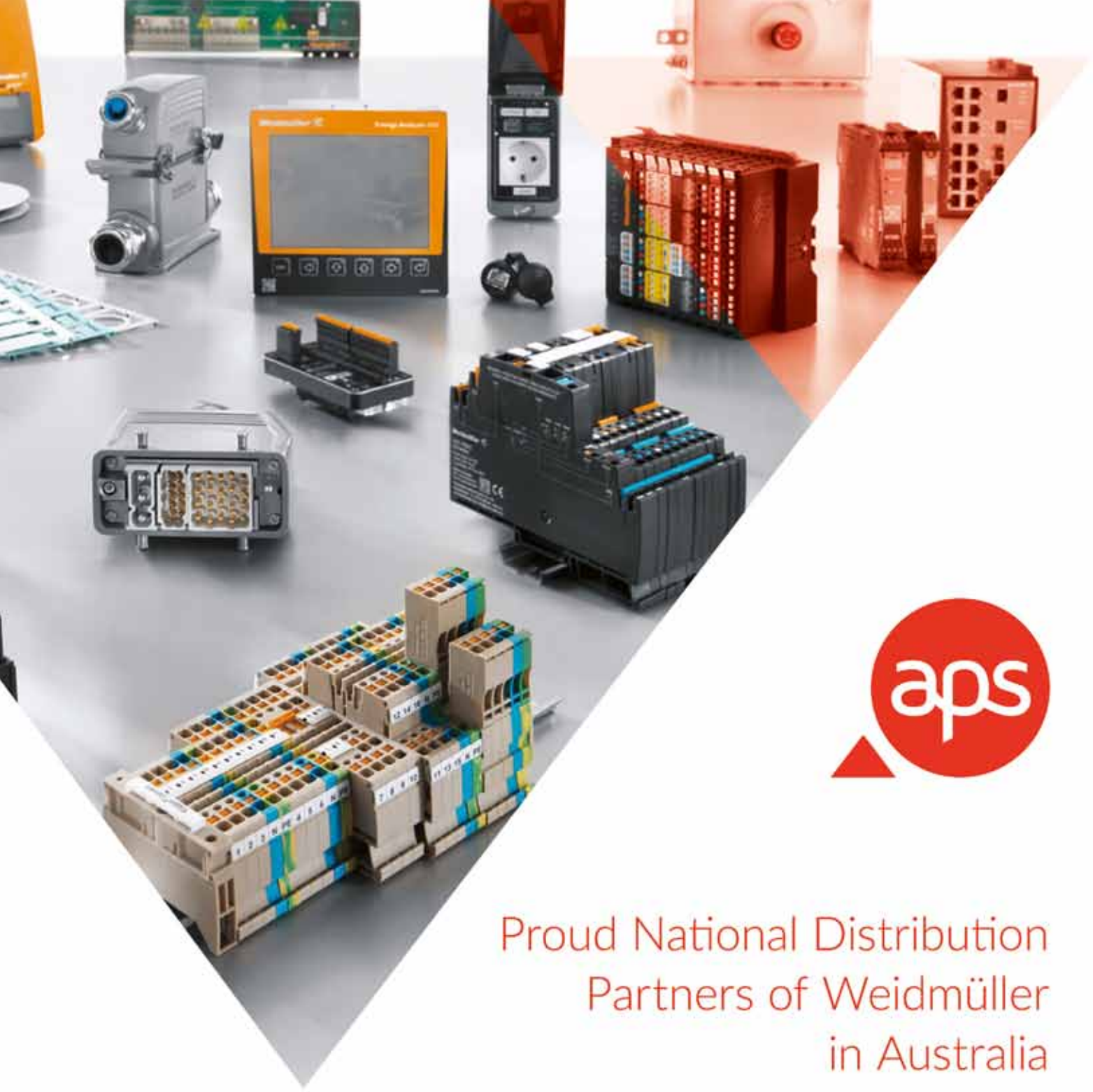
"What was previously an under-utilised space is now reimagined and a prime example of not only the evolving nature of our workplaces, but how innovative business partnerships can bring sustainability and social benefits to our CBDs."

Urban Green's mission is to supply the local marketplace with sustainable, affordable and nutritious food, without use of the damaging pesticides and herbicides that are often used in traditional agriculture. It also strives to educate Sydneysiders on sustainable farming methods and how easy it is to grow their own nutrient-dense food.

Noah Verin, Director of Urban Green Sydney, said: "The COVID-19 pandemic has of course presented us with some challenges over the past few months; however, Charter Hall have been very supportive and it's only encouraged us to make our offering more diverse. For example, we've now started an online store where customers can order and collect straight from the CBD or receive home delivery in certain postcodes. We'll soon also be offering 'grow it yourself' kits for people to have fun with at home, following a successful trial period.

"We're looking forward to when more workers are able to return to offices and we can begin running the exciting educational workshops on urban farming that we have planned in the new space. It's important for more Australians to understand the future of food production and the benefits that vertical farming brings to the table," said Verin.

Although a relatively new industry in Australia, vertical farming can play a crucial role in preparing for increased food demand as the population grows. Through advanced technology, vertical farms are not hindered by natural disasters or formidable weather conditions. Instead, crops can comfortably grow year-round.



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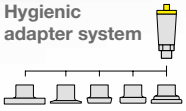

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Looking Forward VEGA

JOHN LEADBETTER

SENIOR MANAGING DIRECTOR AT VEGA AUSTRALIA

What are the three biggest challenges or threats facing your industry in 2021?

COVID-19 has affected VEGA globally from a logistics and manufacturing perspective, with a reduction in business that impacted customer investments and consumer confidence. Companies were facing choices of whether they should invest due to the economic uncertainty and particularly with government initiatives and programs under jeopardy. It has affected customers who export and whether they are able to find diversity in their markets, ie, markets in China and diversification to avoid or reduce restrictions.

What impacts has the COVID-19 global pandemic had on your industry, and how does this affect your business strategies for 2021?

In terms of COVID's impact on industry, it has consequently caused an increased delay in freight times as well as freight costs for VEGA. This means the need for higher investment in carrying more stock, which has increased costs for VEGA. Additionally, restricted access to customers during COVID has meant a new approach with digital marketing campaigns and platforms to combat this and maintain customer interaction/reach. Furthermore, added measures were introduced to encourage and stimulate customer interactions and conversations to adapt to this new disruption of COVID.

What are your thoughts about the post-COVID-19 'new normal' in relation to remote working technologies and supporting staff?

The new norm of COVID and adapting to this means a bigger investment in telecommunications by customers and a bigger investment in training. In terms of supporting staff, VEGA has been at the forefront of providing remote work arrangements and support, and we currently have staff in most states and territories in Australia as well as a service manager at head office that has been able to utilise technologies such as Zoom and Team Viewer to assist customers remotely as well as account managers in any of the states. Our service and sales team have a wealth of experience and utilising Zoom for them as been really central, especially when it comes to reassuring our customers that it is business as usual for VEGA.

VEGA is using a few strategies to help clients when it comes to troubleshooting. While it is ideal to be on the ground, with lockdown laws in place, other methods have been adopted.

"We've got everybody on Zoom, so that is our main way to support the industry in terms of our service and sales team to help with any issues remotely," said Alex Mazor, VEGA's marketing manager. "We are available to help customers with product settings, adjustments and diagnostics. Also, we're remotely assisting our customers by being able to access VEGA software platforms such as PACTware using a remote function via iOS, Android and PC devices, so that helps them with any set-up, product demo or backend configurations.

"Our service and sales team have a wealth of experience and utilising Zoom for them as been really central, especially when it comes to reassuring our customers that it is business as usual for VEGA."

One piece of technology that VEGA is utilising is the VEGA tools app, which can be used on either an iPhone/iPad or Android mobile phone. "In the old days there were two ways of setting up an instrument — either pressing a button on the top or a laptop. Now it's Bluetooth, so the customer can pull out their iPhone or iPad or Android device and use the VEGA tools app. It really just takes troubleshooting and support to the whole next level. VEGA is also doing product demonstrations live through Zoom, setting up a scenario where the company can go through the product with clients. While the circumstances in which they work might have changed, the amount of support VEGA offers has not."

What sustainability strategies will be at the forefront for your business in 2021?

An increased emphasis on more customer training via online and face-to-face workshops and a bigger focus on customer communication strategies via digital platforms and CRM management. Furthermore, R&D investment with the development of innovative battery-powered units is on the cards for 2021 along with greater access and focus on IoT infrastructure. We strive to work alongside a number of organisations to achieve the "common" goal. Standardisation of product selection is another area we will be focusing on, whereby combining the benefits of six models into three models will aim to achieve a more versatile product offering and reduce stock holding for customers.

John Leadbetter has had the pleasure of working with VEGA for over 24 years now and has been in the industry for well over 40 years. He started out in an apprenticeship in the trade of instrumentation and then ventured into sales and support in 1988, with a focus on developing and forging long-lasting relationships with customers. Another interesting aspect of his career with VEGA has been adapting to and embracing the constantly evolving changes in the industry, experiencing the era of older technologies and over time phased into new IoT platforms and infrastructure.

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MARTIN BROGLIA

MANAGING DIRECTOR, BONFIGLIOLI TRANSMISSION PTY LTD

What opportunities do you predict for growth in your industry in 2021?

Each year brings a host of new innovations and possibilities to the manufacturing landscape. We at Bonfiglioli are set to launch two new products. These will broaden our service capabilities and will once again showcase that we have listened to our customers' needs.

Industry 4.0 and energy savings remains at the centre of our sector, and this is set to continue. Adding to this is the emphasis on local manufacturing, lights out operations and the decoupling of supply chains as a result of COVID-19. For us this means better and faster service to our local customers.

What are the biggest challenges and threats facing your industry in 2021?

Naturally, everyone has a lot of market share to go after and there is still major emphasis on recouping profits that were lost over the lockdown period. The lockdown impacted on companies both big and small, and the landscape is extremely competitive.

We anticipate delays in projects and a more conservative approach to investment and spending due to the uncertainties. Stricter credit criteria are also a factor when it comes to capex investments.

Bonfiglioli has cemented its name in the industry over the past 30 years and we stick to our guns. We always focus on what we can do to better service our customers and this will remain the same for 2021.

What impact has COVID-19 had on your industry and your business strategies for 2021?

Looking back at the start of COVID-19 and what we have learned, there has been so much good too. Resilience has become the buzzword among business circles during this unprecedented time, and it's certainly what has kept us going over this period.

In 2020, we took a proactive approach to face the challenge of finding the right balance between operational costs and meeting customer and staff needs. We had to overcome the ability for onsite visits to resolve issues. We implemented online platforms and anticipate that these will continue as we keep looking for new ways to be agile and ready for any eventuality.

Our lean business model and focus on happy staff and customers sets the tone for 2021 and puts us in good stead.

How has the current international uncertainty impacted your cybersecurity or supply management plans?

COVID-19 has taught us to prepare for every eventuality. We have invested in innovation and technology to keep up with the 'new normal' and to ensure that both our staff and customers feel supported.

In terms of our supply chain, we are supportive of the government's efforts to bolster skills and local manufacturing. Being in a different time zone to our parent company in Italy has helped us to become resilient and self-sufficient over the years. We have spent a lot of time and resources investing in local manufacturing and based on this, it's business as usual. We have the stock (product supply) and skills to support customers around the country.

What are your thoughts about the post-COVID-19 'new normal' in relation to remote working technologies and supporting staff?

The safety of our staff has always been a key focus for Bonfiglioli. During our 30 years in the industry, Bonfiglioli has prioritised the safety of its staff, teams, clients and customers, and as the coronavirus pandemic took hold, this resolve only strengthened.

We welcome remote working — it adds flexibility and a good work/life balance. It has also been evident that our team doesn't work less because they are at home and it has strengthened our trust bond in one another. As a global company, we have always had strong communications resources in place, and this has only been further developed over this time to best support remote working.

What sustainability strategies will be at the forefront of your business in 2021?

Sustainability comes in various forms. We are conscious about our environment and pride ourselves on implementing energy-saving practices and developing sustainable solutions to as far an extent as possible. We also focus on giving back at a global level. This aligns with our founder, Clementino Bonfiglioli, who believed that helping our next generation of leaders guarantees both a better future for them and for the communities in which they live. We therefore are firmly convinced that a better future is only possible by fostering education for all youth.

How is your industry preparing for AI developments or advanced manufacturing?

The demand for robotics is increasing year-on-year and traditional component manufacturers are keeping pace. We at Bonfiglioli are working our way towards our smart factory goals and will continue to support the industry in terms of advanced manufacturing requirements.

Martin Broglia is Managing Director of Bonfiglioli Australia and New Zealand and holds an Electronic Engineering degree from his home country, Argentina, and an MBA from the University of Sydney. Through his career, which spans over 20 years working for the top players in the power transmission and drive engineering game, Martin has gained expertise in industries such as mining, bulk materials handling, packaging, logistics and food and beverage manufacturing.

WaterGroup helps Sydney Water listen out for leaks

Image courtesy of WaterGroup

Sydney Water is continually exploring and implementing innovative technologies to improve water services for its five million customers.

In collaboration with the University of Technology Sydney (UTS), the water utility is improving strategies to reduce leaks and breaks across its network using acoustic sensors — selecting four leak-detections systems and deploying 229 acoustic sensors across five CBD areas including Sydney, Bankstown, Penrith, Chatswood and Liverpool.

One such system is WaterGroup's Sebalog N-3, which allows water utilities and large water users to continuously monitor water networks for leaks — helping clients save money and water.

WaterGroup Managing Director Guenter Hauber-Davidson said time is of the essence when detecting and locating leaks.

"Our N-3 noise sensor network leak monitoring solution allows leaks to be detected in days rather than months, and minimise[s] long-term losses across the network," he said.

"We are happy to be a part of Sydney Water's leak detection program, with 73 out of the 229 sensors provided by WaterGroup.

"Since the sensors were deployed, they have identified 13 leaks and a further eight alerts as of November 2020, which are now all under investigation."

WaterGroup's smart N-3 loggers magnetise to pipes, allowing continual monitoring for leaks. Every day between 2 and 4 am, loggers take 100 measurements of the noise level, also recording a two-second audio file at 2 am. The logger will only send the audio file if the lowest measured noise level exceeds a set threshold value. The audio files and histogram data of the 100 measurements can be accessed on the Seba Cloud portal.

Using the four leak detection systems, Sydney Water has detected up to 70 hidden leaks, with crews already repairing 45 of these leaks — including two water main breaks.

WaterGroup Pty Ltd
www.watergroup.com.au

NEW PRODUCTS

ENERGY CHAIN FOR ROTARY MOVEMENT

The igus twisterband HD is an energy chain designed so that cables and hoses can be guided safely and reliably even during rotary movements. It is said to be very stable, easy to fill and can even cope with rotating speeds of up to 180 degrees per second around its own axis.

With the twisterband, rotary movements up to 7000 degrees are possible on the horizontal plane and 3000 degrees on the vertical plane in an extremely small space, even at speeds of up to 180 degrees per second. Slip rings can therefore be replaced in the case of a limited rotation angle. Different media lines as well as bus cables or even fluids can be guided with one system easily, cost-effectively and without any interruption. The inner compact heights of the new sizes are 11 and 18 mm — optimal for very small installation spaces such as in rotary tables or on robots.

The twisterband HD is very slim, light and fits closely around its own axis of rotation. The energy chain consists of individual chain links that can be connected to each other by means of a pin-and-hook principle. This results in a defined bend radius and simultaneously ensures greater stability. The energy supply solution is made of maintenance-free tribo-polymers into which a fibreglass-reinforced material has been worked. As a result, the twisterband HD has a longer service life.

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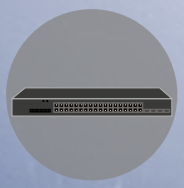
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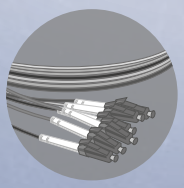
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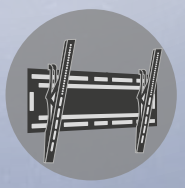
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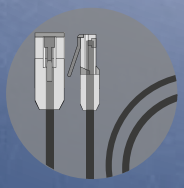
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NEW PRODUCTS

SMART LIGHT RANGE

The Brightgreen smart light range offers circadian lighting to help users regulate their body's natural rhythms.

These lights provide Day Shift and Night Shift modes. A variable correlated colour temperature (CCT) regulates the body's circadian rhythm (sleep-wake cycle) by naturally manipulating melatonin production. Cooler lighting temperatures and high brightness encourage feelings of wakefulness and focus (Day Shift), while warmer temperatures and dim lighting increase feelings of relaxation and restfulness (Night Shift).

Other product features include low-glare lenses and housing designs to increase visual comfort, high light quality via Tru-colour technology (97 on the colour rendering index), high-frequency drivers for smooth dimming, directional beams and gimbals for control.

The smart light range includes downlights, strip lights, wall lights, panel lights, track and pendant designs, as well as linear styles. The lights are compatible with the most prominent smart home apps on the market, but a Brightgreen hub is also available for those who want to begin scaling up to the company's full wellness system.

Brightgreen Pty Ltd
www.brightgreen.com

BARCODE LINE SCANNER

The Wenglor BLN series barcode line scanner has a large scanning area of 20 to 200 mm or 30 to 520 mm depending on the model, which is said to greatly increase flexibility in system design and installation. The compact design (29 x 60 x 52 mm) also enables installation in tight spaces such as complex intralogistics facilities. The BLN scanner reads 1D codes with a very high density of over 0.075 mm in static and dynamic applications of up to 0.3 m/s with a scan rate of 510 scans/s. The decoded information is sent directly to the system via an integrated Ethernet or RS-232 interface.

Visible red light helps to ensure that the code is optimally aligned in the scanning area when used in manual workstations. The successful decoding is then output directly to the operator via a green 'Good Read' LED, while the OLED display shows the information stored in the code.

In addition to the easy operating concept requiring no additional software, the smart sensor has a robust housing design with IP67 protection, which also makes it suitable for use in harsh industrial environments.

Treotham Automation Pty Ltd
www.treotham.com.au

IoT ROUTER

The WoMaster WR222-WLAN+LTE/NB1 IoT router brings serial and wireless LAN data to the cellular network.

It supports LTE/NB-IoT to wireless LAN redundancy and LTE/WLAN auto offload to optimise network performance.

The RS232/422/485 port connects to meters, sensors or Modbus RTU devices to send data to the remote cloud centre over the cellular or WLAN network by Modbus TCP or Secured MQTT (MQTTS). To safeguard cybersecurity, security features such as Firewall, OpenVPN and GRE tunnel are supported.

The embedded MQTTS and RESTful API enables instant public WR222 and is a smart solution for smart city and IIoT applications as an LTE/WIFI dual radio field IIoT router. The router supports serial RS232/422/485 over LTE/WIFI communication for field sensor/PLC to cloud data aggregation. The LTE modem supports the important BAND 28 700 MHz frequency used widely across regional Australia.

The embedded MQTT and RESTful API enables public cloud integration such as AWS or Azure. The WoMaster private cloud platform ThingsMaster and ThingsMaster OTA can also be set up for instant and secured access to receive data or manage devices remotely. To safeguard cybersecurity, security features such as Firewall, OpenVPN, GRE tunnel are also supported.

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STEPHEN BALL

HEAD OF MARKETING, PACIFIC, AVEVA

What opportunities do you predict for the growth of your industry in 2021?

It's more than likely that all industries, including the ones with which we're most intimate, will be looking to the immediate future with fear, uncertainty and doubt. However, like many of the challenges that our industries and our economy have faced in the past, there is opportunity. For example, in the 1990s our aggregate growth was driven predominantly by productivity gains (75% of GDP); in the 2000s this was inverse: 25% of economic growth was driven by productivity. Considering this, the only way out of the current economic environment and to drive growth will be through productivity gains; gains that can only be enabled by technology and digitalisation, supported by governments federally and at a state level. While this growth may be challenging and a bit 'lumpy' at times, there will be growth and future prosperity in a new kind of normal.

What are the three biggest challenges or threats facing your industry in 2021?

There are really two challenges, as I see it.

The first is capital constraint: businesses are deferring capital decisions that are NPV positive ie, likely good for their business in the medium term but deferring in an effort to mitigate risk. The other challenge is uncertainty: while there's uncertainty of demand and of supply, there's stagnation and therefore paradoxically, increasing risk, not less. This will be a difficult cycle to break.

The two are interrelated and difficult to resolve. Due to the current state of the economy and the industries in which we operate, many businesses are deferring decisions until things are generally more certain, more 'controlled' — which is understandable. In a world of constant, rapid change and under (in many ways) existential threat from something we have no understanding nor control of, the status quo seems like a logical choice.

However, it isn't. Companies that reduce costs selectively and focus more on operational efficiency (among a couple of other key drivers) will — with the highest probability — emerge from a downturn stronger across all their key metrics than when they entered the downturn.

What impact has the COVID-19 global epidemic had on your industry, and how does this affect your business strategies for 2021?

The impacts have been in many ways diametrically opposed. On the one hand, capital constraint has slowed decision-making and subsequent investments as already highlighted. But along with this, is the operational burden and cost of incremental validation and greater stakeholder engagement in an effort to ameliorate risk. On the other hand, industries that have a clear line of sight to incremental returns have been aggressively pursuing the realisation of these benefits and fast-tracking decision making and implementations.

Managing and servicing what are essentially dual horizons has been challenging for us and our partner ecosystem. This two-speed approach is challenging to support and has required a new level of agility right across the organisation. This dynamic isn't going to abate — the world needs to re-adjust to growth and for growth, and we need to enable that for our customers.

How has the current international uncertainty impacted your cybersecurity or supply chain management plans?

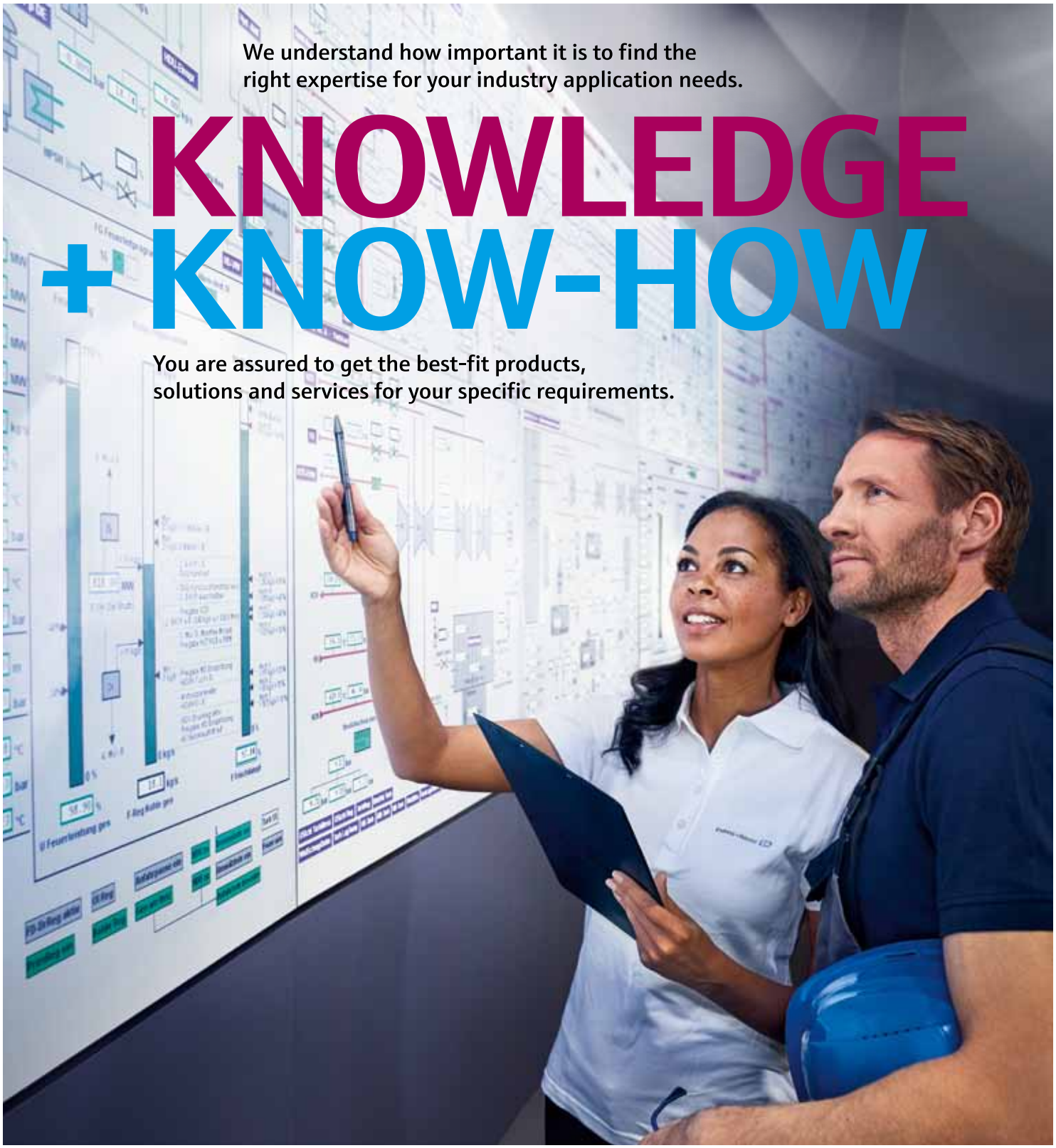
Our participation in the global economy has undeniably made Australia and Australians more prosperous. And this will continue as the demand around the globe increases as economies recover. However, the downside is our exposure to cyber risk. So in many ways, we've been managing this risk for a very long time — it's been fundamental to being able to deliver value to the markets we serve for our entire history. However, it has validated and fast-tracked the development of plans to further mitigate risk and empower workers, and to take to market solutions that shore up data security and the supply chain. We are working tirelessly developing our direct cloud offering, working with our cloud partners and our customers to unlock the benefits available in the cloud to minimise cyber risk.

What sustainability strategies will be at the forefront for your business in 2021?

Anything that has an ending is, quite literally, unsustainable. It sounds glib, but as a consequence ANY decision we make as a business will ensure that we deliver growth to our triple bottom line — people, planet and profit. We began these plans in earnest this year for our own business, and continue to make investments to deliver returns for us, as well as for our customers and theirs. As mentioned though, ensuring our own workforce and our customers' workforces can work safely remotely — and therefore continue to deliver value — will be critical although the risk brought to bear by the pandemic will subside.

But more than that, because of the technology we develop we have a social, moral and commercial obligation to support and enable our customers' sustainable operations.

Stephen's a bit odd. He has a had a diverse career that has taken him from the heady world of advertising to the world of recruitment where he headed up an agency awarded with a smart companies biggest innovator award, and then gone on to work for the biggest tech brands in the world. Today, he works at AVEVA. He's passionate about executing business strategy and holds an MBA and a Masters of Management from MGSM.



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WARWICK BARDSLEY

MANAGING DIRECTOR, ENDRESS+HAUSER AUSTRALIA PTY LTD

What opportunities do you predict for the growth of your industry in 2021?

2021 will be another interesting year for all industries. Following on the unpredictability of 2020, and with the hope of vaccines to come, this will at least give some hope and resolution to the ever-necessary lockdowns and restrictions we have all faced during 2020. Now having had some forced insight as to how some types of work can transition to new ways, this should give us all the confidence that we can operate 'normally' in less-than-normal circumstances.

As the clouds part we should see some opportunity in delayed or postponed projects recommencing, and even the smaller process and efficiency activities recommencing within plants. Hopefully with a vaccine, and low virus rates within the community, the state governments, and local plant operators will see a reduced risk of infection, and a resultant reduction in shutdowns due to COVID-19. This would allow the engagement of contractors on locked-down sites allowing things to get started again.

The other handbrake we must watch is our trading situation, and the current trade status between Australia and China. Many industries can, and will, be affected by this ongoing spat, unfortunately affecting confidence. In some ways this is not a bad thing as it's been a reminder that you need a diversified market to ensure resilience. There is lots of work going on behind the scenes to both address the China challenge, and broaden the market, which is a good thing. There are many opportunities out there with the strengthening trade agreements within Asia and with the changes in the UK.

What impacts has the COVID-19 global pandemic had on your industry, and how does this affect your business strategies for 2021?

We have had a mixed year in 2020. We were able to act quickly and change our Sales and Marketing focus early on, realising that physical presence would be greatly curtailed. The overall performance in the industries we serve has been varied, as their individual demands for their products have changed, either decreasing, remaining stable, or actually increasing, depending on the segments they are serving.

For us, we will plan for increased physical interaction with our customer base via site visits and industry events, but will also continue with our virtual services such as continuing to increase and improve our web-based tools and online services, expand our web-based information and training offering, along with virtual exhibitions, and continue to offer online customer support with case management and virtual service offerings.

How has the current international uncertainty impacted your cybersecurity and/or supply chain management plans for 2021?

The issue of cybersecurity has been one on our collective minds for some time, and we continue to invest in this area, for the good of our customers and ourselves. We have watched in the recent past major disruptions to physical supply chains by the corruption of IT systems, bringing whole businesses to their knees extremely quickly. We don't want this to happen and continue to pursue a strategy of an in-house IT service provider (InfoServe), focused directly on the needs of our business.

We also strive to ensure the robustness of our IIoT offering such as achieving EuroCloud 4 Star Certification for our Netilon cloud-based services. Our physical supply chains have also had their challenges, mainly due to the rapid change in air freight availability and cost during the COVID crisis. We now keep larger inventories, have expanded our sourcing, and further developed and tightened our freight contracts.

What are your thoughts about the post COVID-19 'new normal' in relation to remote working technologies and supporting staff?

The envisaged flexible working arrangements, that for many years have been possible but not popular, have been undertaken by necessity by organisations around the world. It is possible for non-presence work to be done remotely, commonly in a home or alternative environment away from the office, with a high level of quality and engagement. Although the technology is sound, after the investment of many of the basics, the arrangement doesn't suit everyone, and this must be worked through. We are still human, and I believe that there is still a need for human interaction that can't be 100% covered by a video link — there is a need for some amount of workplace attendance. Team building and maintenance, integration, collaboration, and innovation depend on it.

The 'new normal' will likely be a balance, and an acceptance that at times remote working makes sense, and at other times office days are required. We have had flexible working arrangements in place for some time, and the technology to back that up has been there. The move to remote working was pretty seamless. Now it's up to business managers to ensure guidelines and support are in place to allow and facilitate a situation that gets the best out of both worlds.

Employers will have to look to having regular office days, and further work on the engagement piece to deliver value on those days, for both the organisation and the individuals, for the new normal to work for all. The companies that do this well will get the best from the new normal — and we intend to be one of them.

Sydney-based Managing Director of the Australian operations of Endress+Hauser, a Switzerland-based innovator and provider of both lab and process instrumentation, service and solutions, Warwick Bardsley has had a ground-up career in industrial instrumentation and control over the last 30 years, with a family history in manufacturing, business operation and management.

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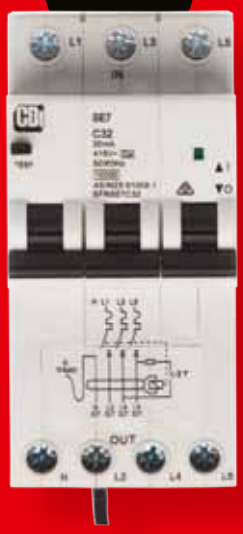

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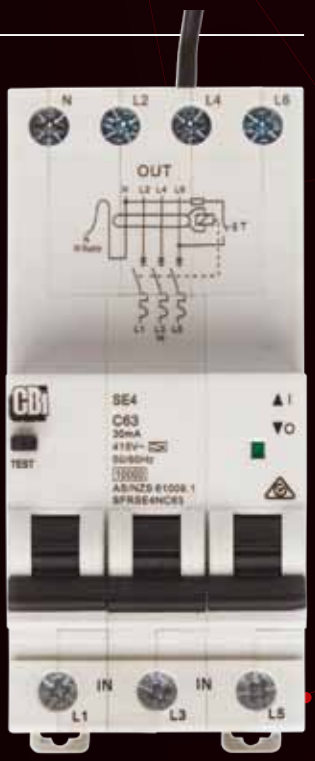

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WHAT DOES 'LIFETIME WARRANTY' MEAN FOR ELECTRICAL EQUIPMENT?

Christopher Holmes, Weidmuller

When a supplier offers a lifetime warranty for industrial electrical equipment, this can often sound like a dream come true.

The idea that a warranty will cover industrial electrical equipment for its entire lifetime is certainly appealing — but is there a catch?

Before leaping to accept a lifetime warranty offer, it is extremely important to conduct research and read the fine print — as there can be some surprises in these so-called lifetime warranties. For instance:

- The warranty can exclude fair tear and wear. In most cases, electrical or electronic devices fail because of fair wear and tear ie, from reaching the expected duty cycle of the product, or from an unexpected or excessive event, eg, a transient or surge current. The lifetime warranty will not cover those failures.
- The 'lifetime' warranty can be entirely at the discretion of the supplier: the supplier can decide not to approve a claim.

In other words, there is no guarantee that a claim under lifetime warranty will be allowed by the supplier.

- There is no guarantee that a replacement product will be available straight away — and replacements may not even be available locally. This leaves businesses at risk, with product or system failure or downtime and no replacement available.
- The warranty may not include onsite repairs, service or installation, or return shipping costs. These costs can be significant, particularly when installation is remote or the equipment is bulky.

Given the above, is there really any difference between a standard warranty compared to a lifetime warranty? Our view is that the answer is no.

Australian law already makes sure that any product sold is subject to warranty, and that the purpose of a warranty is to make sure that the product sold is free from defects. In the event there is a defect, the supplier has to repair or provide replacement. Although the lifetime warranty may be advertised to cover the entire lifetime of a product, in reality as shown above, there is little to no difference compared to a standard warranty. There is simply no added value or extra coverage under the extended or lifetime warranty.

When making a procurement decision, more than just quality products is required — reliable service from the supplier partner is also essential. The following questions should be asked:

- Does the supplier have available replacement products in stock? How quickly can I get a replacement?
- If you are exporting the equipment, will there be a source for components of the equipment? Will services be available at the place where the equipment operates?
- Will the supplier provide customised warranties for my project?
- How reliable and accurate are the technical data sheets and user manuals? Is the equipment and/or the supplier certified to applicable standards?
- What is the supplier's track record?

Just asking these questions will help to narrow the field and rule out the 'too good to be true' offers. Once potential suppliers with the required level of service have been identified, then look at what type of warranty is needed for the electrical or electronic equipment being procured. Here is a useful checklist of what to do and look out for:

- Is the product covered under the warranty? Always read the standard terms and conditions and the fine print.
- What exclusions apply? If wear and tear is excluded, the warranty is likely no different than a standard warranty.
- How quickly are replacement parts available?
- How long will it take for the supplier to assess a claim under the warranty? Will you be left with downtime costs while a claim is being assessed?
- Does the warranty include onsite repairs or service or installation?
- What happens if the product is superseded during the warranty period? Will it still be replaced?
- How long will the warranty last? Can the supplier end the program at its discretion?
- Do you have to register under the warranty? What happens if you don't register?
- Are return shipping costs covered under the warranty?

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RUSSELL PALMER

MANAGING DIRECTOR, YOKOGAWA AUSTRALIA & NEW ZEALAND

What opportunities do you predict for the growth of your industry in 2021?

Market dynamics, cost, environmental and safety challenges were already placing significant pressure on the industries we operate in prior to COVID-19. As much as this combination of factors led to growing spending constraints, it revealed many priorities and highlighted future business direction.

Business continuity planning had become an irritant for many: after all who would believe countries would go into full lockdown! COVID-19 exposed the dangers of underestimating the need for a robust plan and the risks of being unable to operate your process due to unexpected constraints. This has led to many organisations beyond the resources industry reviewing the need for remote access and operations as part of their BCP.

After much hype, we will finally see new sensing technologies being implemented. End users are now relating the huge value in IIoT-based sensing — when presented with a solution fit for purpose — to potential operational and safety improvement. Digital transformation must be robust and planned effectively to ensure resilient transformation, which our customers in the mining, water, oil and gas, power and food and beverage industries have come to rely upon.

What are the three biggest challenges or threats facing your industry in 2021?

The last 12 months have shown that previous industry assumptions are no longer a solid basis for future planning. The belief that lowest cost is always best — especially when that lowest cost relies on overseas supply chains and personnel — is redundant. Whilst market competitiveness is a good thing, due regard must again be given to business continuity.

Secondly, focusing primarily on cybersecurity from an IT perspective creates potential for systematic failure and business exposure. IT and OT departments work to different KPIs, which are often conflicting. Much has been written on this subject, yet changes are yet to be seen. There is a growing sense of urgency and this change is something we are driving hard to support in our clients' initiatives.

The third challenge is the shift in worker demographics and the risks associated with an ageing workforce, worker migration and loss of experience. However, I see this as an opportunity. The next generation of managers, operators and engineers are already in place and they bring a new, innovate outlook. The real challenge for current leadership is to enable and challenge this next generation to excel, especially in areas such as sustainable operations, diversity and cultural sensitivity.

What sustainability strategies will be at the forefront of your business?

The range of industries we work in means we indirectly touch the lives of everyday Australians and New Zealanders. This makes us conscious of being responsible corporate citizens, and protecting the planet for future generations. From a global perspective, Yokogawa have signed up to the UN's Sustainable Development Goals and were recently included in the Dow Jones Sustainability Index as a company making significant contribution to the achievement of a sustainable society, which is a real honour.

Historically, a significant portion of our work has been based around process optimisation and improvement. Optimising turbines for example to reduce fuel consumption, improve energy output and reduce emissions. Using our expertise to assess application requirements to reduce chemical and raw material usage while ensuring process outflow is carefully monitored to meet environmental guidelines. These are only a few examples of many of our sustainability contributions beyond in-house initiatives as we aim to achieve zero net emissions by 2050.

Looking forward, there are many other examples where our technology and engineering expertise is employed. Energy management, emissions monitoring, leak detection, wireless noise mapping and supporting renewable energy initiatives, as we focus on a 'What's Next for Our Planet' drive.

How is your industry preparing for artificial intelligence development?

The concept of artificial intelligence has been around the process and manufacturing industries since the late 1980s, so the term is not new. The difference in 2021 is that enabling technologies required to make it effective are now readily available.

AI is one component of digital transformation in process industries as it moves from industrial automation to industrial autonomy. Building on existing infrastructure, using intelligent sensing of all aspects of the process, provides insights for analysis of performance, better safety and removing bottlenecks. Using intuitive graphics, remote access technologies and greater use of robotics will improve the process and increase employee and environmental safety. Digital twins can also be incorporated for ongoing evolution with high levels of data analytics revealing important new insights.

The potential is significant but not having clear objectives, timelines, budgets, industry-experienced partners and high-level management buy-in will do no more than burn through money — and in a worst-case scenario degrade performance. Put a project team in place (with high level sponsorship), have big plans (but start small), pick your partners carefully; and once you get momentum move quickly to stay ahead of the competition!

Russell Palmer is the Managing Director of Yokogawa Australia & New Zealand and has been with Yokogawa Australia for 21 years. Russell has held roles from front-line engineering sales to Sales and Marketing Director — a position he held for 10 years. Russell's focus is on collaborating with customers to make possible new solutions to the problems faced in industry.

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KATHRYN WOOD-ENRIQUEZ

CEO AND MANAGING DIRECTOR, POWERFLO SOLUTIONS

What are the three biggest challenges or threats facing your industry in 2021?

Under the current pre-vaccine COVID climate, our industry is facing supply chain delays. One may imagine that it's all related to material sourcing and or shipping issues, but it's not completely. Working from home may bring many benefits, but discussing complex engineering design issues away from the team reduces efficiency and expediency. A critical part of the engineering of custom-engineered control valves within a certain timeframe is the need for the engineers and planners to come together and sometimes 'think outside of the square' in a collaborative way. Working from home does not always facilitate this.

Compounding this are delays in material sourcing — especially for special 'exotic' materials: in some cases suppliers have not been able to weather the COVID-19 storm and have been forced to close their doors, or worldwide demand has exceeded supply, or they can't be delivered within the required timeframe. And of course there are fewer planes in the air and ships at sea. The resultant situation is that our industry will have to accept higher costs for materials if they are required on shorter-than-normal delivery timeframes.

The second issue for our industry — and particularly for a company like ours — is that some clients are not committed to finding long-term solutions but rather a short-term fix. While some sectors can get away with low-cost valves (due to less than onerous conditions), many industries are playing with fire when insufficient care is taken to select the right valve for the application. In many applications such as coal-fired power generation, failure from high cycling stress fatigue will become more common unless the valves are engineered correctly.

Then there is the issue of Australian sourcing. I believe that it should be everyone's duty to support Australian-owned companies and especially Australian-owned manufacturing companies. The threat to Australian industry is that we are currently so reliant on overseas sourcing and if we continue in this vein, then there will be no incentive for any manufacturing to take place in Australia. We have seen this during the COVID-19 pandemic and I believe that industry should get behind the government's incentives to help Australia return to manufacturing, and buy Australian.

What impacts has the COVID-19 global pandemic had on your Industry and how does this affect your business strategies for 2021?

As a business, we have weathered the pandemic reasonably well, but it was not without hard work and commitment. What it has proven is that to run a successful business in unprecedented times like this requires a great deal of commitment and focus and 'making your own luck'. We were able to deliver most of our customers' orders on time, due to our large commitment to the stocking of inventory. This inventory, which is held as componentry as well as complete equipment, enabled us to build to order, within days or weeks rather than months, with the resultant opportunity to secure new business when our competitors could not deliver. We were able to focus on providing a higher level of customer support, and with many people working from home we did our level best to reach out and make contact with our clients, to see how they were and to engage with them for new opportunities.

Our business strategies for 2021 will further focus on assisting our industry by providing 'mud-maps' for product selection by application. These mud-maps will assist our customers, particularly those new to our industry markets to understand the nature of the application, what the characteristics of the application are and the basis of correct product selection.

What sustainability strategies will be at the forefront of your business in 2021?

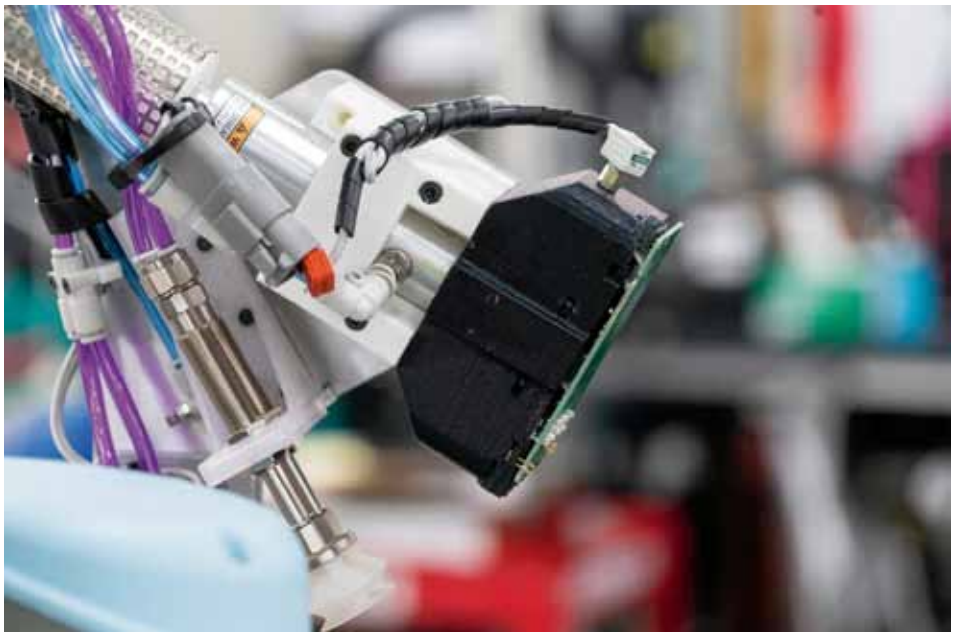
With 2021, marking our 110th year in business, we are excited to consider our next 20-Year Business Plan. We are positioning ourselves, through our commitment to manufacture more in Australia, to find opportunities in the defence and pharmaceutical sectors. We will also expand our sales horizons far beyond where we are already based, as we embark on increasing our export business; with increased volumes, we can reduce our manufacturing costs, which is good for our local customers.

Our sustainability over the past 110 years has occurred because of our willingness to participate in a wide range of market sectors and to listen to what our customers want. Our business model is to be the very best that we can be in our sector and yet be totally adaptable to what our customers want us to be. This makes for great long-term sustainable partnerships. Our team is learning new things every day and in turn, we can teach.

And crucially, we have purchased a new building, which is in its final stages of being engineered to our needs. We are creating great workspaces, great learning spaces and great building spaces — this is our pledge to the industry. Our staff, our suppliers and our customers are our greatest assets.

CEO and Managing Director of Powerflo Solutions, Kathryn Wood-Enriquez has been in the engineered control valve industry for over 35 years. With an expansive knowledge of control valve design, sizing and application, Kathryn focuses on engineering long-term solutions for the most difficult of control applications.

South Australian manufacturer automates electronics assembly



To be globally competitive, South Australian manufacturer REDARC looked to automate manual processes for improved productivity and quality. As one of the largest employers in South Australia's manufacturing sector, the company wanted to move some of its line staff to more fulfilling roles that would add value to the company's bottom line.

"We decided to automate the assembly and labelling of our Tow-Pro V3 Electric Brake controller, to remove the menial tasks in production, while allowing our operators and technicians to transition into higher value roles in the company," said Mitchell Adams, Manufacturing Engineering Team Leader.

One of the core requirements for this project was safety, and fitting ergonomically into the current operating environment. The technology deployed needed to be safe, energy efficient and quiet.

Adams said that they engaged SMC Corporation ANZ to come up with a suitable solution for the pneumatic automation, in a way that would stand the test of time and offer a blueprint for future automation cells.

"It was our first major automation project — it needed to be robust, flexible and of high quality," he said. "At the same time, it had to be easy to use and low maintenance. There were a number of processes to automate and this took a lot of time and design study.

"As it turns out, the automation project could not have come at a better time. By automating the process, we have been able to continue manufacturing around the clock, even during COVID-19."

In an installation first for SMC on local shores, the company made use of the latest technology from its head office in Japan by implementing the first ZH10 air multiplier in Australia. It was run on a trial and found to be a good fit for the automation project.

According to Jason Sutton, SMC Area Sales Manager in South Australia, SMC has been working on a range of solutions with robotic implementation in mind and this application enabled them to develop a range of end effectors which worked well in the robotic arm.

"The major challenge of the project was the automatic handling of printed circuit boards," he said. "Unlike a traditional suction cup and vacuum generator, we have used an SMC ZH10 vacuum multiplier coupled with a 3D-printed vacuum chuck to pick and place the PCB during automatic assembly."

This solution provides a close gap between the chuck and PCB board but does not seal against it. The large flow rate of the air multiplier trying to draw air through the gap creates vacuum across the PCB board holding it against the chuck. With the PCB only in contact with the chuck at the outer edges, sensitive board components are protected. The pressure switch ensures constant feedback of vacuum in the system to the PLC and indicates correct engagement of the part in the chuck.

He adds that the correct product selection was integral to this project — especially as this would be a prototype of similar applications to follow.

"We needed to provide a solution that could meet all the customer's requirements," Sutton said. "We looked for a complete solution that would tick all the boxes and work collaboratively to deliver an energy-efficient, quiet and smart way of working — sustainable and scalable for the future. By doing this we were able to meet all of REDARC's operational objectives."

The special air multiplier used in this project is quiet. It was a key requirement to not disrupt the quiet work environment in the rest of the factory.

"The beauty of this project is that is showcases so many standard products working in just the right combination to deliver an elegant solution," he continued. "Working with Mitch on the design and problem solving throughout the process was a very interesting journey. It really helped me challenge my product and engineering knowledge to find just the right fit for each part of the automation process."

Adams believes collaboration between all parties was critical and says that this once-off project has now been selected as best practice going forward.

"We were able to successfully automate the assembly of the Tow-Pro thereby increasing the efficiency and the reliability of the process. The solution is easy to work with and ensures both longevity and flexibility," he said.

For a longer and more detailed version online, go to https://bit.ly/2JTv8BW

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Sydney office towers fight food waste

The war on waste has come to Sydney's Grosvenor Place. In a bid to combat food waste, the premium complex with sweeping harbour and city views has installed a waste food recycling system using an enrich360 dehydrator. The dehydrator dehydrates the food collected from office and retail customers, removes the moisture, then heats and cleans the biomass, converting it into a fertiliser that appears much like dirt.

Located in the basement, the machine produces fertiliser for compost, which goes back to the farm for growing food — creating a circular economic system.

More than 10 tonnes of discarded food were processed into the biomass in the first three months of installation.

Grosvenor Place Executive Director Joh Derrick couldn't be prouder of his team, which has embraced the project to make meaningful waste.

"We save on the bills to the tune of $20,000 a year in waste costs, plus we save on the environment by diverting literally thousands of kilograms from landfill and producing a useful, regenerated product to put back to use in agriculture," he said.

In a CBD environment, composting is not an option, but the dehydrator's ability to convert waste in less than 24 hours allows resources to be recovered, reducing landfill and replenishing nutrients.

Diverting food waste from landfill also contributes to reducing the methane waste food emits, so Grosvenor Place scores on many sustainability fronts with this new investment.

enrich 360 said the food waste fertiliser is a good way to stop soil degradation as it replaces the need to use chemical fertilisers and produces more nutritious and tastier food.

Derrick explained that Grosvenor Place is keen to share its experience and happy to showcase the solution to other interested commercial property building managers considering joining the circular economy of food waste.

The achievement of this sustainability goal follows the management team's uptake of the Simply Cups scheme, which was introduced to the building in August 2019.

NEW PRODUCTS

COMPACT CONNECTOR INSERTS

As robotics and other industrial machinery become increasingly compact, multi-axis and multi-functional, the installation space intended for devices such as servomotors is accordingly decreasing. Components like connectors must keep pace with the robotics technology. To assist in this area, the ILME CQ4F/M 03/2 is a combined insert with three poles plus PE with two additional auxiliary contacts for an improved power management.

Its original proprietary design allows a compact combination of power and brake contacts and has been specifically developed for new-generation robots (6 axes) and to be mounted on their relevant servomotors.

Suitable for standard 40A CXF/XM series crimp contacts (up to 6 mm^2 or AWG 10) and 10 A CDF/CDM series crimp contacts (up to 2.5 mm^2 or AWG 14) it also includes a dedicated coding pin, for up to four different codings.

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FOOD FOR THOUGHT

How can you reduce the cost of general waste, increase landfill diversion and earn green points with customers with a food recycling service?

Food waste recycling is the number one opportunity for businesses to take a bite out of the general waste bin and grow their sustainability credentials.

The cost of food waste to the Australian economy is estimated to be around $20 billion each year with 2.2 million tonnes being disposed of by the commercial and industrial sector alone. It's a surprisingly large amount of wastage, especially given the potential of this nutrient-rich organic material.

Supermarkets, wholesalers, importers, retailers, schools, aged-care facilities, hospitality, commercial kitchens and food manufacturers stand to benefit the most from a dedicated food waste recycling service.

In a Cleanaway audit of a large retail customer's waste streams, food waste made up 60% of their general waste bin. General waste bins containing wet and heavy organic material need to be collected more regularly, which increases the cost of service — so the more that's diverted, the less expensive waste services can be. With landfill levies on the up as governments seek to encourage recycling among waste generators, it makes sense for businesses to divert as much waste as possible from landfill.

For food manufacturers and supermarkets where food waste is hard to avoid and often in bulk, our depackaging service is an exciting solution for recovering expired, damaged or mislabelled food previously destined for landfill. Separating food and liquid from packaging can be extremely labour intensive and inefficient so a service that can accept a range of packaging types and organic volume is a game changer for recovery rates. The extracted material isn't much to look at but it's liquid gold for agriculture and Cleanaway works with our partners to ensure nothing goes to waste.

For commercial kitchens, aged care or facilities with food courts and cafeterias an on-site recycling process may be best for kitchen waste. A back-of-house system gives a range of businesses access to efficient food recovery technology at the point of disposal. Cleanaway's units can take care of bones, oyster shells, pineapple heads and avocado seeds that are difficult to break down, heavy and take up a lot of space in a regular bin.

In Australia, Cleanaway is spearheading food waste recovery with fit-for-purpose processing technologies and end-to-end recycling solutions that turn organic material into compost to nourish crops, liquid nutrients injected directly into soil and even electricity to power homes and businesses.

Selecting the right service is more complex than simply having a food waste bin. An experienced service provider will work with you to develop a solution tailored to your needs by:

- assessing the unique requirements of your operations to recommend the right recovery technology,
- supporting the service with staff education and bin signage, reporting, pre and post service audits for compliance and recommendations to improve the service,
- making recommendations to optimise your supply chains and explore ways to complement recycling with waste minimisation initiatives,
- understanding your sustainability goals and measuring services to ensure your KPIs are met.

Good for business, better for the environment, benefits the community. Can you really afford to let another morsel of food go to waste? Now that's a thought to chew on.

Cleanaway is Australia's leading total waste management, industrial and environmental services company. We have supported Australian businesses for over 50 years, delivering solutions that offer extraordinary benefits not only for our customers, but also for our communities. Speak to us for a tailored consultation — cleanaway.com.au/for/food-waste.

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CHRIS HOEY

MANAGING DIRECTOR FOR BÜRKERT AUSTRALIA AND REGIONAL COACH OF ASIA-PACIFIC

What opportunities do you predict for the growth of your industry in 2021?

2021 will be an exciting year for the process automation industry. This past 12 months we've seen how businesses with technology enabled strategies showed flexibility and resilience, and delivered innovative responses, through what many found to be a turbulent time. The next 12 months will distinguish even further those who adopt a resilience mentality over disaster recovery exercises. Being prepared is no longer enough, you need to be wired effectively throughout all your process areas.

Locally we've experienced a push towards digitisation in recent months. Fast-tracked installations by many companies, as they've seen how technology can support them to be more competitive at home and in the global market. Added to this the financial stimulus offered to Australian businesses and the promise of continued support for local manufacturing growth, I anticipate 2021 to be a year of opportunity for those who are ready to embrace digital connectivity.

What are the three biggest challenges or threats facing your industry in 2021?

Firstly, I fear that due to the vast uncertainty we have faced in 2020, that there may be a lack of confidence toward investment by Australian manufacturers. It won't be good enough to try and defend our position, I believe we need to take the opportunity to meet this challenge head on: develop new products, engage new markets and develop new ideas.

Secondly, we should not forget what this pandemic has taught us. In Australia, we need to be more self-reliant, innovative and competitive. We need to use our resources and add value. Our manufacturing industry should be flexible — for growth and downturn, or new innovative product production to meet demand. Remote access and maintenance through new technologies offers greater control and analytics, 24/7 providing peace of mind and industry edge over more manual workplaces.

Finally, the threat of fallout from our largest trading partner cannot be ignored. For me, this proves the need to implement the points I mentioned above. We need to generate new markets and most importantly, add value to our plentiful resources with our plentiful (hopefully better-priced) energy.

What impacts has the COVID-19 global pandemic had on your industry, and how does this affect your business strategies for 2021?

Those within our industry who adapted quickly from the beginning I think have fared well. In embracing digital communication tools, staying connected with customers and continuing to provide essential equipment to essential services, has enabled us to continue our high level of service and high-quality product to existing, evolving and new clients. What we implemented will now remain part of Bürkert in the future, further cementing our innovative nature.

Many of our customers have learnt that things can happen beyond their control and the "status-quo" can change fast. Those who have flourished have been able to pivot. Those who will continue to grow and succeed will not stand still — they'll continue to innovate, evolve and adapt where necessary to keep ahead of their competition and their market needs. That's the key difference.

Our 2021 strategy is to continue to innovate. Digital technology, like connectivity, diagnostics, asset management, simplification and speed in project delivery will set us apart in the industry. We're on board here to support Australian manufacturing where needed; it's imperative to be working at the same pace as these industry leaders, so that's what we're going to do.

What sustainability strategies will be at the forefront for your business in 2021?

Globally and locally Bürkert has firm policies to support short- and long-term sustainability. Through continued support of our customers to implement better, more efficient equipment and process architecture.

Swimming in front of this wave is hard work, riding it would be ideal. I fear however that Australian Government is swimming behind it, which is equally as hard, and we risk not being able to catch up. In the meantime, we will continue to support our customers to implement better and more efficient projects and hope that once again, business leads government in implementing a sustainable future.

Bürkert has been at the forefront of product development in aligning sustainable production value through smart management of raw materials all the way to end user energy efficient processes. We achieve this by an integrated approach with all our new product developments. With this, we can provide a more resilient and flexible range of products for the market, that they can be assured have been produced to the highest standards, resulting in less waste impacting the environment and positively affecting the end user's bottom line in using energy efficient, cost saving equipment.

Chris Hoey is the Managing Director for Bürkert Australia and Regional Coach of Asia-Pacific. Whilst holding a diverse international management portfolio, Chris remains hands-on and strives to be part of developing applications of new technologies to meet current and future challenges. With over 30 years of experience, his enthusiasm for industry evolution and solution development is second to none and is a key influence within the business in seeking new modernisms and efficient processes for Bürkert customers.

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MICHAEL SAINSBURY

CHIEF EXECUTIVE OFFICER, IPD GROUP LTD

What opportunities do you predict for the growth of your industry in 2021?

Since COVID-19, businesses have been seeking to improve efficiencies and are wanting suppliers that offer comprehensive solutions. In September, IPD Group acquired Control Logic, which has given us the capability to provide end-to-end solutions for our customers across Australia. This allows us to streamline our service to customers and is timely considering the growth opportunities that have emerged in the new environment. We are seeing growth in solutions for healthcare including aged care, data centres considering the growth of cloud applications and the demand for data centre space and cybersecurity, food and beverage solutions, and government infrastructure such as schools, roads and rail. Manufacturing is a key opportunity because the pandemic made business realise the impact of having a heavy import strategy, and how this was dangerous for the entire supply chain. To mitigate potential future risks, manufacturing is coming back into Australia, with automated solutions a big part of the manufacturing process.

What are the three biggest challenges or threats facing your industry in 2021?

Apart from ongoing impacts from COVID-19, the biggest threats are:

Cybersecurity. During the past 12 months a ransomware attack put our business offline for three days. For us this is a big threat. Our investment in cybersecurity is significant and we are increasing this investment to protect against both internal and external threats. We recognise that if our system was hacked, it could impact the security of our customers. Our biggest risk internally is our employees not having the knowledge to appropriately mitigate cyber risk. To address this, we provide our teams with cyber awareness training and regularly spam employees with simulated email attacks to determine individual responses. This allows us to identify employees who need further training. Our customers also face similar concerns for their automation networks and we are able to provide them with solutions to help mitigate these risks.

Sustainable energy production. Energy costs are going through the roof and this is a big risk for both businesses and the private sector. One example is new technologies such as electric vehicles, which are proving more popular. While they haven't taken off in this country yet, it's only a matter of time and this will put more pressure on power generation stations. We are already seeing this with the huge amount of energy that powering the uplift in data centres is creating. A key challenge for Australia is whether we will have enough infrastructure to meet this demand, and if not, which is likely the case, tailoring our investment towards clean energy solutions.

Skills shortage. Our company depends on engineering skills for our distribution business and trade skills for our services business. Trying to find qualified people in both of these disciplines is becoming more challenging because there is little attraction for young people to learn a trade compared with the previous generation of employees.

What impacts has the COVID-19 global pandemic had on your industry, and how does this affect your business strategies for 2021?

Our business depends on high technology products that are manufactured overseas, so with factories working at reduced capacity it impacted our supply chain. We tried to mitigate this impact by increasing our inventory and changing the way we did business with our suppliers. It necessitated a much closer working relationship with our suppliers than we had in the past. Before we had more of a transactional relationship but now we have a partnership approach. This has been a good outcome from the pandemic that will remain with our business in 2021 and beyond.

What are your thoughts about the post-COVID 'new normal' in relation to remote working technologies and supporting staff?

As a business we've always put the health and safety of our employees at the centre of everything we do. COVID-19 forced us to provide more flexible working hours and the technology needed for remote work. While our administrative staff could work from home, our warehouse operators needed to remain on site, so we split work shifts to reduce the risk of employees catching COVID-19. During lockdown we met every day as a management team. We'd never used Zoom or Microsoft Teams before, so the first meetings were on Houseparty. We found that applications previously used for social interaction became critical business tools, and reduced business travel. Historically, if a customer in Perth needed assistance, we'd have to physically travel to meet them. Now we can jump on a Zoom call within minutes and give our customers the same level of personalised attention without the travel time or costs. Since COVID-19 we have adopted working from home more than we did in the past. However, we won't move to a permanent work from home environment because so many valuable conversations that happen in the office around common areas, don't happen on Zoom. We believe this also provides a number of benefits for the wellbeing of our 'work family'. We also found that working remotely posed a number of significant challenges for new staff, who didn't feel comfortable with onboarding and training in isolation despite our best efforts. For us, the balance is about having flexibility while ensuring the wellbeing, safety and protection of our employees.

Michael Sainsbury is Chief Executive Officer of IPD Group Ltd and a member of the company's board of directors. He joined IPD in 2013, bringing more than 15 years of technology-based industry leadership, electrical solutions and power monitoring expertise, and senior management experience to his role.

BUILDINGS CAN HELP CREATE A

SUSTAINABLE FUTURE

Paul Crothers

Imagine your ideal building of the future: sustainable, flexible and efficient — designed around and operating in sync with the people who inhabit it.

You don't need to think too hard — the smart buildings of the future are already here and they aren't necessarily the latest gleaming office tower. Increasingly, building owners are taking advantage of digital technology to retrofit existing buildings, with dramatic improvements in comfort, flexibility and efficiency.

Smart, digitised buildings of the future are about much more than cost and comfort — they can lead us towards a carbon-neutral world. With sustainability a pivotal issue for companies across the nation, reducing the emissions that flow from our buildings can be a crucial step in meeting carbon-neutral targets.

Buildings account for 40% of carbon emissions, and we could cut a third of those emissions through greater efficiency alone. One-third of the energy we create for most buildings today is wasted — lights are on when there's no one there, or air conditioning is working ineffectively.

Each year, new (hopefully clean and green) buildings account for less than 1% of the buildings in our cities. The biggest potential gain for our climate comes from retrofitting existing buildings. And when we combine digitisation with electrification we unlock massive efficiency benefits.

The first step in improving the energy efficiency of a building is using digital assets to understand inefficiency, so you can make decisions and automate actions to address it. Digital is a key enabler of sustainability for buildings, providing the capacity to monitor and manage facilities, creating that cost and climate-saving efficiency.

The technology for efficiency is here today, but that tech is often siloed and different functionalities aren't working together. Digital enables us to blend, putting data in the hands of users and allowing them to make decisions to better operate buildings.

The data captured by a building's traditional operating technology (OT) — including building management systems for air conditioning, electrical and energy, security, lighting and more — often sits unanalysed and underexploited. We need to ensure the opportunities provided by the Internet of Things (IoT) can interact with a building's fundamental operating technology to allow its data to be leveraged to enhance a building's ability to become smart and sustainable.

The increasing quantities of valuable data trapped within traditional OTs needs to be unleashed through the convergence of OT and IT solutions that can be enabled with an IoT-enabled platform.

Smart building systems monitor and alter parameters according to user needs — it comes back to helping people work productively; everything from the right light, CO_2 levels, heating and cooling, security, and space utilisation.

For the occupant, the building can alter all these systems according to their needs, providing more comfort and an enhanced working experience. In the smart building, so much comes down to space utilisation and space activation, understanding what is going on across the workplace, around the workplace and where people are most productive. It's about making the right, functional space available at the right time.

Operating our buildings better saves energy, activating services and spaces when and how they are needed, creating spaces for a purpose, with the right level of comfort, lighting and environmental conditions — providing optimum conditions for teams and sustainability.

New technology means building hardware can be altered by software. Software that used to control a floorplate can now zero in on rooms — the air conditioning, the lighting and spaces can be broadened into two, three or four zones.

Traditionally, building systems were built as a fixed arrangement — to make changes to a space or to the functionality of the space, you had to physically shift equipment and people. Now technology allows us to reconfigure the space based on how the space is being used around it.

As we know, what enables smart buildings is the IoT element, activating rich data so it becomes active, available and actionable. Schneider Electric provides IoT-enabled platforms such as EcoStruxure Building Operation that allow for the integration and activation of building data into the IT space, which then allows further integration with activities and services that are more user or business centric.

The next step towards a smart, sustainable building is managing your energy source. We must maximise electrification. Electricity is the most efficient form of energy, especially when digitised to control demand and supply — going all electric and all digital ushers in a new era of Electricity 4.0.

Electricity should come from renewable sources. With the proportion of renewable generation growing steadily, companies should be looking to Power Purchasing Agreements. Schneider Electric's advisory division, Energy and Sustainable Services, has negotiated many of these procurement solutions for companies big and small.

Some businesses are becoming independent of the network by implementing their own microgrids. We helped South Australia Produce Market do just this. Previously, the market's electricity had been externally supplied — now the market has installed a solar-powered microgrid, giving it autonomy, and it is significantly cutting power bills.

Microgrids, powered by solar or wind, reduce carbon footprints, and when combined with battery storage, allow buildings to operate independently of the grid. Solar is a great energy option for many buildings, even creating the potential to become an energy prosumer, selling energy back to the grid.

This pandemic year has seen relationships with places of work change. As we develop new, more flexible ways of working, smart buildings can assist that transition, adapting and evolving to the requirements of the workforce.

Data has played a key role in our changing ways of work as we've embraced remote working. As we contemplate returning to offices in greater numbers, data will enable us to have the necessary information around levels of safety and comfort in the physical environment. It will allow us to better utilise our corporate spaces in safer and more productive ways.

A new offering from Schneider Electric can assist, providing Australia's first all-in-one approach to digitally managing buildings' operations and energy consumption. The Connected Room Solution is an IoT ecosystem that senses dynamic environments and makes automatic and on-demand app-enabled adjustments to lighting, air conditioning and blinds, while also providing interaction with the next generation of smart building IoT devices.

The technology allows us to reconfigure the space based on how it is being utilised, providing dynamic adjustment of environmental conditions for the users' immediate surroundings. It makes a building responsive to the changing needs right now, but also futureproofs it.

The buildings of the future must be both sustainable and productive. Today's global demands for sustainability and flexibility will push the transformation of buildings into overdrive. To survive and thrive as a building developer, owner and operator, you need to capture the power of the all-digital, all-electric world with more efficient and people-centric buildings.

For more information, visit se.com/au/buildings-of-the-future.

Schneider Electric
www.se.com/au/en

NEW PRODUCTS

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EXAIR vortex tubes are designed to provide a maintenance-free solution to a variety of industrial spot cooling problems. Using an ordinary supply of compressed air as a power source, vortex tubes create two streams of air, one hot and one cold, with no moving parts.

Vortex tubes can produce temperatures from -46 to +127°C, flow rates from 1 to 150 SCFM (28 to 4248 SLPM) and refrigeration up to 10,200 Btu/h (2571 Kcal/h). Temperatures, flows and cooling power are adjustable over a wide range using the control valve on the hot end exhaust.

Over the years, the basic vortex tube has been used in many industrial cooling applications. A few have become popular enough to warrant the development of an 'applied product' designed to suit the specific application. These products include the adjustable spot cooler, mini cooler, cold gun and cabinet coolers for cooling and purging electronic control panels.

Standard vortex tubes are suitable for ambient temperatures up to 52°C. High-temperature vortex tubes for ambient temperatures above 93°C are also available.

Applications include cooling electronic controls, cooling machining operations, cooling CCTV cameras, setting hot melts, cooling soldered parts, cooling gas samples, electronic component cooling, cooling heat seals and cooling environmental chambers.

Compressed Air Australia Pty Ltd

www.caasafety.com.au

DIGITAL PANEL METER

Acromag VPM3000 Vertu digital panel meters are able to operate as a transmitter or alarm to satisfy a wide variety of process and temperature applications.

The VPM3000 is field-programmable to accept many inputs including process voltage, process current, platinum RTDs and the four most common thermocouples. It can also provide 24 VDC to power a transmitter's 4–20 mA signal. Two relays and isolated 4–20 mA output options increase the utility of the display. The relays can be used for limit alarms or control applications. The 4–20 mA output provides isolated retransmission of the input signal — especially useful for temperature inputs like thermocouples and RTDs without an additional signal conditioner.

A shallow-depth, 1/8 DIN enclosure features a NEMA4X front panel and convenient mounting hardware. There are two power options: 85–265 VAC or 12–36 VDC. AC powered versions can provide 24 VDC to power a transmitter or other instruments. Programming and set-up are easy with either the four front-panel pushbuttons, the free configuration software or using the Copy function.

Extra-large display numerals are 30.5 mm high for easy reading from a distance. The display intensity is also adjustable to compensate for various lighting conditions, including direct sunlight.

Metromatics Pty Ltd

www.metromatics.com.au

RUGGED TABLET

The Winmate M133WK rugged tablet features an Intel Core i5-8265U 1.6 GHz processor with up to 1 TB to deliver a CPU performance that allows high-performance applications to run with the support of the Windows 10 IoT Enterprise operating system.

The product is IP65 rated for protection against dust, dirt and water ingress. The tablet has passed MIL-STD-810G testing for shock, vibration and accidental drops from 1.2 m to concrete. It features a large, 13.3″, 1920 x 1080 IPS widescreen LED panel with user-friendly touch experience enhanced by projected capacitive (PCAP) multitouch and high readability in humid outdoor environments delivered by optical bonding and anti-glare technology.

The device is equipped with WLAN 802.11a/b/g/n/ac and Bluetooth by default with the option of GPS/GLONASS and 4G LTE for more connectivity.

Backplane Systems Technology Pty Ltd

www.backplane.com.au

LOAD CELLS

Interface load button miniature stainless steel load cells are small in size but have a wide range of measuring capacities, from 22 N to 220 kN. The spherical radius design of the Interface compression load button load cells is frequently used in confined spaces providing high precision force measurement solutions.

Innovating industries are increasing the demand for accurate sensor technologies they can use in OEM applications, like medical devices, drones, industrial automation, packaging and robotics. The engineered product designs of these smaller applications require high-performing load cells, like the LowProfile pancake-style load cells, in a much smaller construction.

Interface load button load cells have diameters ranging from 25 to 96 mm, heights from 10 to 38 mm and are offered in a range of models.

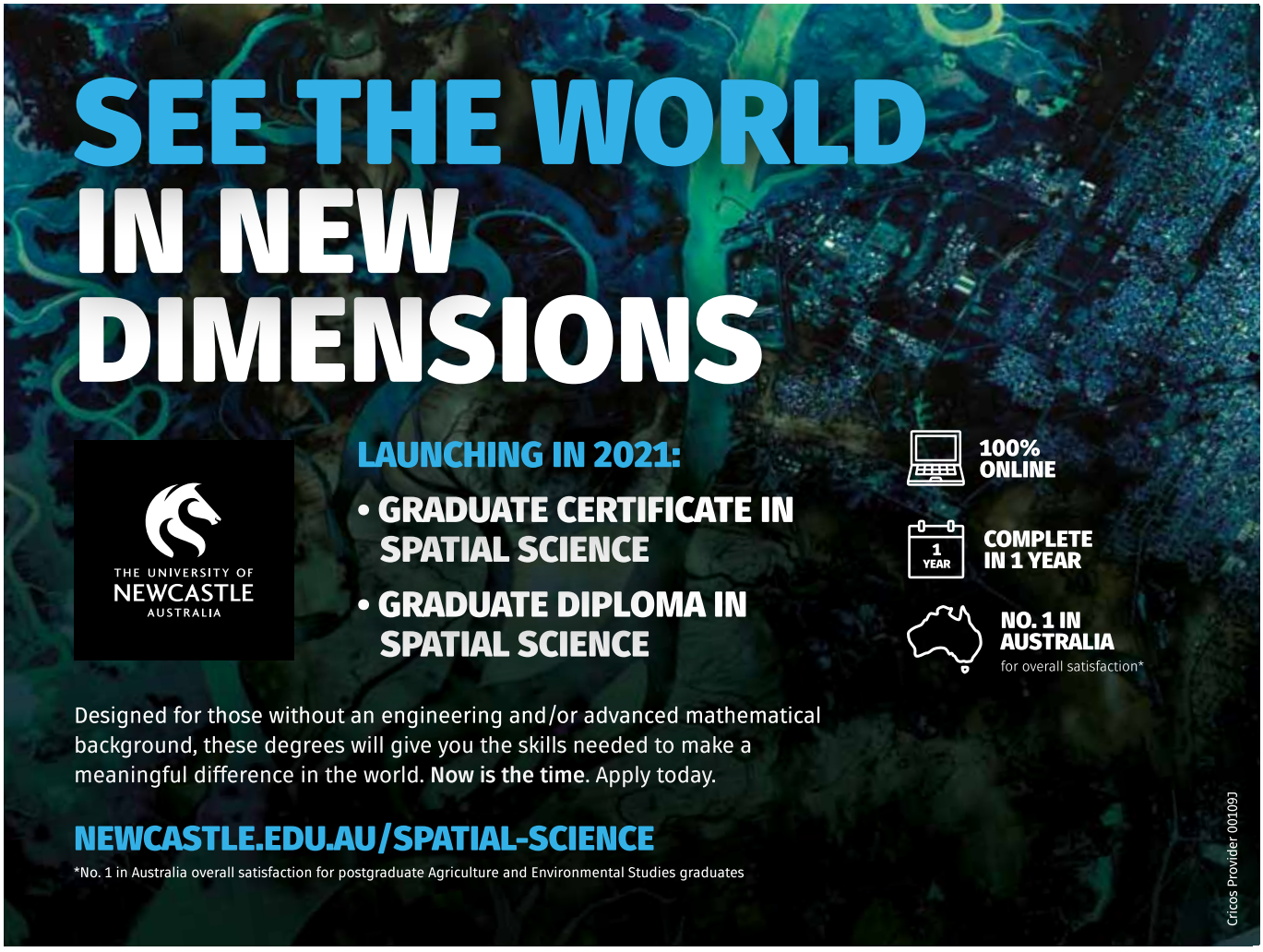
The LBM compression load cells offer capacities from 110 to 220 kN and are environmentally sealed and temperature compensated, while the LBS miniature compression load cell is a small load cell that offers capacities ranging from 22 N to 4.4 kN and can be as small as 3 mm in height.

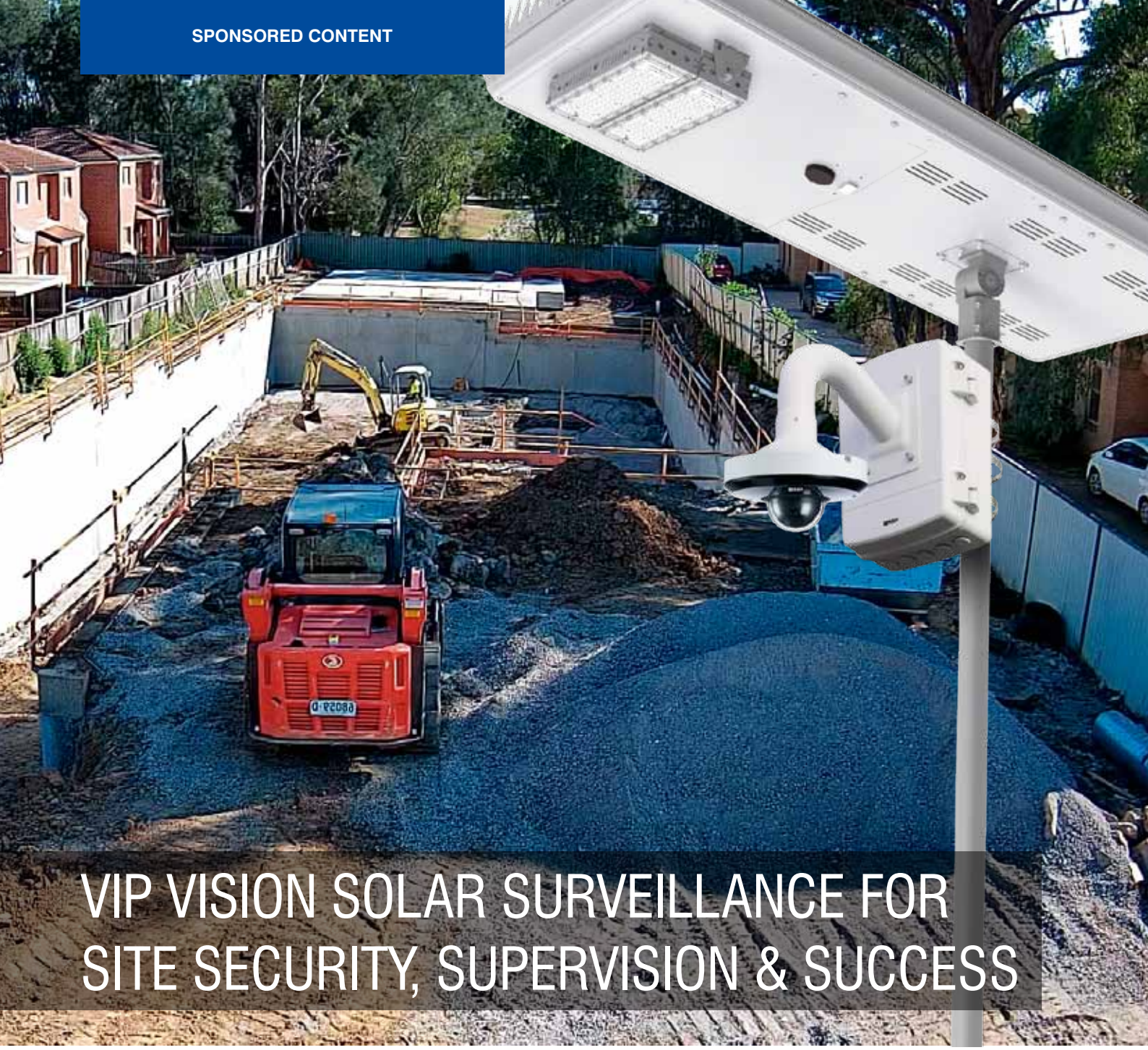
The LBMP overload-protected compression load cell is overload protected, temperature compensated and has a small diameter. Its capacities range from 0.01 to 100 kN.

The LBMU ultra-precision compression load cell offers higher accuracy and enhanced eccentric load rejection with capacities from 444 N to 4.4 kN, while the MSC miniature column compression load cell uses Interface's proprietary temperature compensated strain gages. It has a small compact design with low deflect.

AMS Instrumentation & Calibration Pty Ltd

www.ams-ic.com.au





VIP VISION SOLAR SURVEILLANCE FOR SITE SECURITY, SUPERVISION & SUCCESS

From construction and mining sites to business and government applications, the 4G solar surveillance system from VIP Vision can be delivered to the most challenging of sites.

Outdoors surveillance installations can be challenging to install, especially in locations such as construction sites and farm fields that do not have reliable power infrastructure set up. In addition, underground cable runs to cameras can be both time consuming and expensive.

VIP Vision Solar CCTV Systems delivers professional surveillance to the most challenging of sites. With self-sustaining solar power and an internal lithium battery, the system can be installed in almost any outdoors setting, without the need to run any cabling.

It features the latest in 4G-enabled remote site surveillance, with advanced camera artificial intelligence and simplicity of installation and operation. With comprehensive remote viewing options, the site can be viewed from almost any device, including iOS (iPhone and iPad), Android, PC and Mac software or web browser.

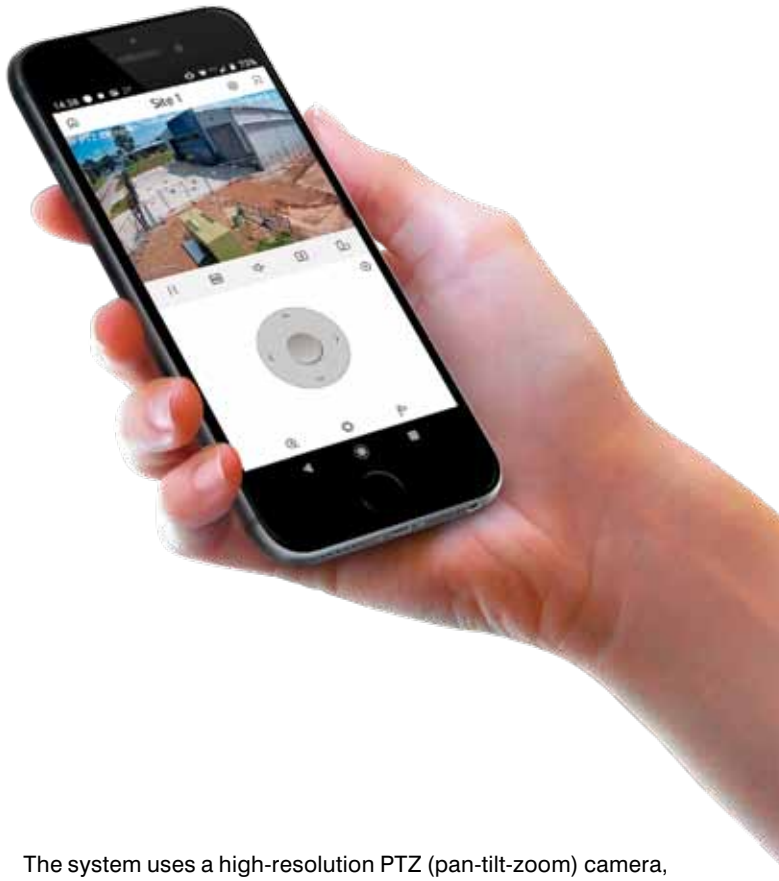
Common solar CCTV applications

Business: Identify people and vehicles entering and leaving remote worksites. Users receive real-time notifications via mobile app or email.

Construction, roadworks & mining: Oversee any construction or mining project. Check arrival and departure times. Generate time-lapse construction videos. Be advised of out of hours activity or site intruders.

Government & councils: Deploy cameras with number plate recognition to identify vehicles committing offences such as rubbish dumping. Provide security and convenience lighting in car parks, nature reserves, boat ramps, walkways etc. Link CCTV cameras back to a centrally managed system.

Rural & farming: Remotely monitor and open/close farm gates or turn pumps on/off. Create long-range WiFi Networks on your



property. Install cameras to monitor livestock, feeding points and machinery sheds.

In all cases the addition of desktop PC software allows remote configuration and monitoring of multiple sites simultaneously. Users can create a video wall at their head office with video feeds from all their sites.

VIP Vision Solar CCTV Systems have recently been installed in multiple construction sites across Sydney, achieving satisfying results.

The system can be set up to take snapshots at regular intervals, which can be used to create video time lapses of the day. This is an excellent way for site managers to review progress made to a building over the course of a day.

With network connections via 4G or WiFi, and remote access via desktop, phone or tablet software, surveillance footage can be easily accessed.

Featuring the latest in AI surveillance technology, the system is capable of distinguishing between people, vehicles, and other moving objects. This, in combination with mobile push alerts, will keep users notified whenever suspicious activity is detected.

The system uses a high-resolution PTZ (pan-tilt-zoom) camera, with rotation up to 355°. This camera can both be controlled remotely via software, and set up to automatically tour the areas, as well as zooming in and focusing on detected people and vehicles. With up to 4x lossless optical zoom, a high amount of detail can be captured from long distances.

The camera features 24/7 continuous edge recording and uses a surveillance-grade micro SD card, automatically overwriting the oldest footage. The included 256 GB card can record over seven days of footage at full resolution, with the use of motion activation being able to far extend this period.

Standard solar surveillance system

The standard solar surveillance model includes:

- 120 W solar panel with built-in 500 Wh LiFePO4 battery to power the system for up to three days in cloudy conditions.
- 50 W LED light (9400 lm) with 360° motion and daylight sensors; can be configured to only light up when needed, be dimmed or disabled entirely.
- 4 MP PTZ camera with pan, tilt and 4x optical zoom functions that can see in total darkness up to 15 m away with built-in infrared illumination (B/W).
- Pole and base with sturdy, galvanised hinged 4.5 m metal pole with approx. 500 kg concrete base.
- Assembly camera junction box and pole bracket with 4G wireless AP.

*SIM card & service charges not included

Contact VIP Vision on 1300 307 067 for a free demonstration

www.vip-vision.com/solar

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WHAT WILL THE POST-COVID-19 SMART BUILDING LOOK LIKE?

Wayne Spencer, CEO

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As Australian organisations prepare for their staff to cautiously return to the workplace in 2021, smart buildings will play a key role in helping them get back to business as usual in the 'new normal'.

Thanks in part to Melbourne's strict lockdown, Australia is faring better than most countries when it comes to tackling the COVID-19 crisis. The staggered easing of restrictions across the country is allowing businesses to plan for a gradual return to work next year, but only with robust social distancing and workplace contact tracing regimes in place.

Tackling the challenges of COVID-19 will see the advantages of smart buildings come to the fore in 2021 although, even before the pandemic, organisations were already embracing their many benefits. The global smart building market is expected to grow from $8.49 billion in 2016 to reach $57.81 billion by 2023, with a compound annual growth rate of 31.5%.

The increasing adoption of energy-saving technologies has fuelled early market growth, offering more cost-effective management of HVAC services. AccessIn is powered by Zetaris technology, which allows both localised and cloud-based HVAC systems to integrate effectively in the one place without the need to rebuild historic technology systems.

Energy management delivers a clear return on investment for smart buildings while also empowering organisations to meet their green targets in alignment with their social responsibility programs.

Enhanced safety and security programs have also driven the take-up of smart building platforms, with the impact of the coronavirus pandemic set to further accelerate adoption.

Take a hands-off approach to smart building access

Touch-free building access will be a cornerstone of the new COVID-safe workplace, as organisations look to reduce physical contact and face-to face-interactions.

This begins at the front door, with automated and secure entry based on user profiles — opening smart locks as well as activating doors and turnstiles automatically, while incorporating infrared heat detection and temperature checks.

Meanwhile, traditional visitor access technologies such as check-in kiosks and physical guest passes will be replaced with touchless solutions that allow staff to securely authorise guests and permit building access without leaving their desk.

These solutions are driven by smartphone apps which take advantage of QR codes, Bluetooth sensors, facial recognition and geofencing, while extending to end-to-end solutions which incorporate car park access.

With most commercial buildings, there is no way of monitoring building occupancy and hibernating spaces accordingly. Likewise, there is no way of monitoring social distancing or trace COVID cases.

Once people are onsite, smart building technologies will allow organisations to meet their COVID-safe social distancing obligations while also demonstrating compliance. This includes enforcing maximum capacity levels, identifying congregation hotspots, issuing distancing alerts, consolidating communication systems, supporting contact tracing and allowing staff to book hotdesks, lockers and meeting rooms.

The COVID-safe practices underpinned by smart building platforms can even extend to the management of cleaning services with minimal touch points, addressing a key challenge for smart building managers by tapping into and analysing building data. Enabling the view of all systems in one interface reduces touch points and increases building efficiency, ensuring that the many points of data are not lost and overseen.

Look to the future

Beyond tackling COVID-19, smart buildings are also a wise long-term investment when it comes to boosting productivity and efficiency across an organisation. The same smart building technologies which underpin social distancing can also allow organisations to make the most of their buildings, such as changing the purpose of spaces to meet different needs at different times of day.

Along with managing and protecting staff, smart building platforms allow organisations to distribute and track assets across a portfolio of sites, as well as manage the life of a building asset to retain commercial value. This includes reporting and digitally auditing faults and maintenance issues more quickly, with predictive reporting for allocating tasks and communicating progress more efficiently. It is also possible to link accounting and time charges with tasks regardless of existing software.

The post-COVID-19 smart building won't just be optimised to help organisations meet the challenges of the pandemic. It opens up a wealth of possibilities for futureproofing buildings, with the use of AccessIn's cutting-edge technology and operations to deliver ongoing value.

AccessIn
www.accessin.io

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In the next 3 years, TSA is focused on driving a circular economy that contributes to a sustainable society, facilitates commercial outcomes and drives public awareness for end of life tyres. We can only do this with everybody on board and committed, from the consumer to government departments both locally and federally.

TSA IS FUNDING SOLUTIONS

Let's make a difference by being custodians of our waste and turn this problem into a sustainable solution.

Use the QR Code to see the innovative tyre derived projects that have been brought to life through TSA funding.

TyreStewardship AUSTRALIA

getonboard@tyrestewardship.org.au

tyrestewardship.org.au

LINA GOODMAN

CHIEF EXECUTIVE OFFICER AT TYRE STEWARDSHIP AUSTRALIA LTD

What opportunities do you predict for the growth of your industry in 2021?

TSA's plans for 2021 remain ambitious and multifaceted.

The COVID-19 pandemic has seen a reassessment of priorities globally. More than ever, people want to ensure the prospect of humanity on Earth is not wasted. Environmental vandalism and the notion of profit at all costs will no longer be tolerated.

The environment is perfect for investment into the recycling of used tyres. The federal government has set the scene for greater consumption of tyre-derived products such as crumb rubber and permeable pavements across infrastructure nationally.

I believe we will see new technology really come to the fore in 2021. Stimulating innovation to advance circular economy principles is at the forefront of the thinking of many organisations.

We expect the export ban on whole baled tyres to come into effect in December 2021. This means we will see organisations start remodelling their business to remain profitable.

We will also see a renewed focus in the off-the-road (OTR) sector. It is vital that this sector considers actions for increased resource recovery.

I believe we will also see retailers being responsible for their used tyres more rigorously than they have been in the past. There is more regulation than ever before and governments at all levels are expecting tyre retailers to do their due diligence with the recyclers/collectors they choose. It will be more critical than ever to be TSA-accredited and continue to meet the Scheme guidelines.

Perhaps most exciting about the year ahead from TSA's perspective is that consumers are going to truly start putting their money with their mouths are, and 'talking the talk' that their tyres do matter. They are going to want their used tyres to be looked after responsibly, and to buy tyres from retailers who use accredited recyclers. It's why TSA is implementing the mytyresmychoice consumer campaign commencing summer 2020.

What are the three biggest challenges or threats facing your industry in 2021?

The export used tyre market we have enjoyed for many years is not going to be the same any more. Countries we have traditionally sent end-of-life tyres (EOLT) to are going to have their own challenges with used tyres. We are not going to have the same outlets to send our tyres to overseas. Some markets will be closed — for example, India may no longer be a viable market for unprocessed used tyres.

While we predict greater investment into tyre recycling across Australia in 2021 — which is exciting — the cost of disposing an EOLT is going to increase.

Research shows us consumers are prepared to pay more for the responsible disposal of their waste, but they want to be comfortable it will be done sustainably. Unscrupulous operators undercutting the cost of collecting tyres with no sustainable outcomes may emerge; illegal dumping may increase.

Australia is also a potential hotspot for dumped rubber crumb from overseas destinations. The levy TSA members pay is 25c per equivalent passenger unit (EPU); compare this to European Schemes where it's $3 per EPU, this provides the opportunity to subsidise their rubber crumb to other destinations. The result is that it can land in Australia approx $200 per tonne cheaper than purchasing locally.

TSA is working with Ernst and Young on an assurity program for its accredited participants. The label provides assurity that the product is generated from Australian waste tyres. This supports local, state and federal government procurement policies and provides a framework to ensure that recycled content is generated from Australian waste.

What impacts has COVID had on your industry, and how does this affect your business strategies for 2021?

It's no secret people's travel has been severely restricted due to COVID, so people aren't travelling — which means less burden on tyres. The global supply chain has been impacted, so as COVID restrictions lift further, Australian retailers and consumers may struggle to get the tyres they're looking for on their cars.

Recyclers have been impacted because they were unable to get containers to export the materials to locations. This further impacted used tyre collections. Recyclers were collecting but the stress on the final disposition of those tyres indicated that in some instances recyclers, collectors and retailers were forced to hold more tyres than they were capable of managing at the time.

From a business perspective, we previously had one auditor travelling around the country visiting recyclers and collectors. Now we have state-based auditors visiting recyclers and collectors even if the borders are closed. And our audit and compliance will continue with self-auditing through technology.

TSA also had to reconsider its auditing process, with restrictions on transport and site visits requiring a rethinking of how these functions could continue. With state-based auditing now in process, supported by a self-assessment questionnaire, TSA is using technology to enhance its auditing function.

Lina Goodman has been Chief Executive Officer at Tyre Stewardship Australia Ltd since January 2019. With more than 20 years' experience in resource recovery and environmental innovation, she started her career at Visy Recycling, which spanned 14 years. Later she joined Honeywell and worked within the energy performance sector. At TIC Group, Lina has been instrumental in delivering circular economy benefits through TIC's Mattress Recycling, Reverse Logistics and Solvup businesses. She currently sits on the Advanced Manufacturing Board, a role appointed by the Victorian Minister for Industry and Employment.

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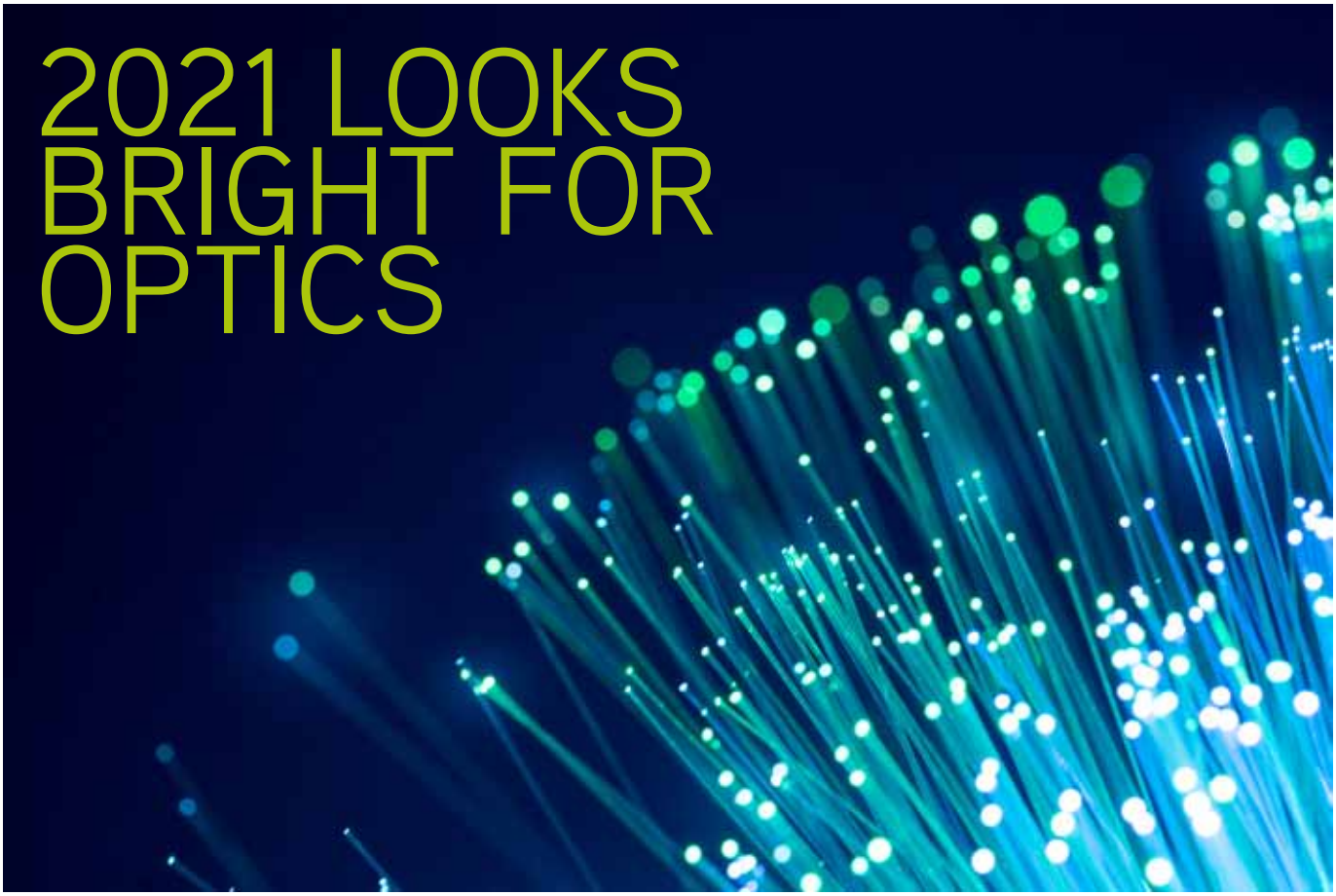
2021 LOOKS BRIGHT FOR OPTICS



With COVID-19 changing the way the world operates, it's clear that working from home is a viable option for many businesses. With this change in the workforce, along with the continued use of online study and telehealth services, comes the need for higher and faster bandwidth for residential and remote networks. This demand has also created more opportunities for fibre-optic vendors, which is expected to continue throughout 2021 as remote working becomes the 'new normal'.

During 2020, fibre-optics and communications solutions provider MSS Data Solutions has seen large and medium enterprises demanding more secure and reliable network performance, in order to collaborate with staff and stakeholders. As part of the demand, **nbn** and 5G networks are growing.

The growth in the **nbn** results in the need for more fibre optics to be installed nationwide, which in turn requires more rigorous and thorough testing.

Behind every 5G tower and antenna is a fibre-optic cable. The complexity of new antenna hardware to meet 5G requirements has resulted in new types of hybrid cables being utilised to connect the antennas to the base hardware. The higher the frequencies used in the higher bands (FR2), such as 20–40 GHz, means even though coverage is lower, bandwidth is higher. The result is the need for additional antennas to enable seamless coverage in each network area. With this, comes more fibre.

With increased bandwidth and data rates on the horizon, discussion of Cat7 and Cat8 copper cable systems has surfaced and being made available. However, the counter argument of simplicity of using fibre has never been stronger because it already caters for the bandwidths that Cat7 and beyond is trying to achieve. So Cat7 and beyond would be more suited for within a rack's connections and using fibre between racks.

The **nbn** is continuing to expand and upgrade from copper to fibre where demand requires it and customers want 100m or beyond bandwidth. With this comes more comprehensive testing and this requires testing regimes and tools that are fully capable to test and verify the installation is capable and connected correctly.

Whether it be for home or business connectivity applications, the fibre in both instances must be tested and verified correctly and MSS Data Solutions has a comprehensive test suite of tools from EXFO to enable and verify this bandwidth and connectivity. This includes testing the ethernet bandwidth that can be delivered down through the installed fibre. If a 100 Gigabyte service is installed, you not only want to verify the optical integrity of the link and its connectors but that the ethernet/IP capability is able to be passed through this pipe, end to end and both ways, up and down, especially when symmetrical throughput is installed. This is especially so in business-grade installations, which are now starting to see 1 Gigabyte symmetrical connections as more commonly available.

Through EXFO, MSS Data Solutions has the testing solutions for this today in addition to having IXIA probe monitoring and Allot cybersecurity monitoring and reporting solutions for proactive network responses when and if required.

The COVID-19 global pandemic has resulted in organisations having to expand their data network facilities and networks, and this has also driven demand for new fibre projects that require fibre and fibre accessories, from racks, splice trays, connectors and everything in between such as fibre cleaning equipment.

With Australia having the pandemic under control, many businesses are becoming comfortable and confident in opening their offices. However, MSS Data Solutions does not expect businesses to operate as they did 12 months ago and expects the trend for fibre to continue to grow throughout 2021.

MSS Data Solutions
mssdatasolutions.com.au

CIRCULAR THREADS

The Australasian Circular Textile Association (ACTA) unveils plans for a circular economy led by product stewardship in the textile industry.

In 2020, Australia's environmental agenda has seen inspiring national leadership. The new Waste and Reduction Recycling Bill passed in August establishes new national criteria for waste handling, and the award of the Product Stewardship Centre of Excellence and National Product Stewardship Investment Fund (NPSI) will contribute to national environmental reform. In the recent NPSI program announcements textiles were the real winner, seeing three grants approved for major textile-related product categories:

1. Corporate workwear (led by the Australasian Circular Textile Association).
2. Mattresses (led by the Australian Bedding Stewardship Council).
3. Outdoor synthetic textiles (led by the Vinyl Council of Australia).

These three distinct sub-categories of textiles will pioneer a broader industry transition to the circular economy.

The ACTA is pleased to have received funding to design its 'Circular Threads: National Uniform and Workwear Stewardship Program', supported by one of Australia's largest uniform suppliers and users. Owner and director of Bisley, Australian manufacturer and supplier of heavy-duty industrious trade apparel, David Gazal expresses his commitment to long-term positive impact, "Bisley is really excited to be partnering with the ACTA and the Bisley team look forward to collaborating as part of our ongoing commitment to sustainable manufacturing practices."

He went on to say, "We see the future of recycling textiles a critical component to meet our environmental and sustainable objectives. Our ultimate aim is to work with ACTA, along with Australian recycling companies, to convert used uniforms and workwear into fibres for future Bisley garments. This is a tremendous step towards reducing the amount of landfill generated by apparel and textiles each year — congratulations to ACTA on being granted funding for product stewardship."

The aim of voluntary product stewardship is to engage key product manufacturers to take a collective interest in end-of-life responsibility for their products, utilising their scale to establish viable means of recovery. This will see the Australian textile industry step up as global leaders in the circular economy while creating local opportunities and jobs.

Australia Post has sought out solutions in the past to responsibly handle old uniforms. As a national company, which oversees various safety requirements in uniforms, Chief Sustainability Officer Susan Mizrahi highlights: "Uniforms are an integral part of many businesses' operations; they protect our staff and show who we are, and their recycling at the end of their life helps reduce pressure on natural resources.

"Australia Post welcomes the National Product Investment Fund and the opportunity it provides to help develop a recycling industry for textiles in Australia; we look forward to working with ACTA on their program."

The Vinyl Council of Australia is working with suppliers to ensure all vinyl-related products (coated/uncoated) in Australia will encompass responsible end-of-life disposal and recycling, (ie, banners flags, linoleum, accessories, furniture). Jan van de Graaff, the council's National Product Stewardship Manager added: "The Australian Government has expressed its intent to move towards a circular economy and one that recognises the value and opportunities associated with waste.

"Effective and well-designed product and industry stewardship schemes have a big role to play in this area, through enhanced design for sustainability, improving the retention of resources within the productive economy and developing systems to capture and recover wastes."

The Australian Bedding Stewardship Council will also be expanding its reach as a successful grant recipient, addressing persistent

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mattress waste for local governments and charities. While we know there's an opportunity to recycle the majority of the components, there's currently no way to recycle the fabric covers taken from all products.

The same applies to kids' car seats. In late 2019, Seatcare received recognition from the federal government, whereby Minister Ley proposed childcare safety seats become a top priority recoverable waste item removed from landfill. More than 1,400,000 new child car seats are sold annually in Australia, and an estimated 200,000 are disposed of each year, the majority going to landfill. A lesser component of the product (which mostly can be recycled) is textile.

Asaleocare, another NPSI grant recipient, will be coordinating recycling trials and scheme design for its feminine sanitary items and incontinence pads, each of which contains a form of textile.

The breadth of textiles in use across the country far outweighs the volume in fast fashion (consumed and used) every year. Through investigative research and analysis, ACTA suggests current import data of textiles is significantly larger than what is tracked in disposal every year — as much as 50% more than commonly thought. The problem is bigger than what it seems.

As textiles garner more attention, the goal is to further expand the local knowledge and expertise to take industry growth to the next level. Echoed support came from the Vinyl Council of Australia in signifying the importance of schematic and systemic change: "It is great to see the federal government actively supporting the Australasian Circular Textiles Association given the strides that they have already taken to date and to foster stewardship of textiles in Australia."

ACTA is the only textile-centric organisation seeking to partner long term with progressive organisations and the federal government. It is aiming to establish a circular economy, develop engaging global leadership programs, harness emerging technology, nurture future generations and grow audience markets between national cross-sectors.

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RESOURCECO

SIMON BROWN

FOUNDER AND MANAGING DIRECTOR, RESOURCECO

What opportunities do you predict for the growth of your industry in 2021?

While the challenges of 2020 are well understood, it's important in times of adversity that we also find the positives and use those as a platform to project us forward. For the waste and resource recovery sector that positivity has been borne out of stronger collaboration between government and the private sector — a willingness to work together to achieve better outcomes for our economy, our environment and our community.

While the circular economy was identified as an area of opportunity pre-COVID, the potential to be driven from a genuine focus on modernising Australia's recycling infrastructure is now broadly accepted to be more important than ever.

Pleasingly the federal government, in particular, has demonstrated a commitment to work alongside industry in driving real action aimed at progressing Australia's circular economy, which has the capacity to not only deliver thousands of jobs, but to also deliver sustainable economic and environmental outcomes. The waste management and resource recovery sector industry is already achieving an annual turnover of $15 billion and providing jobs for 50,000 full-time equivalent employees, reinforcing its status as far more than an essential service.

As we rapidly progress towards the staged introduction of the COAG bans on the export of waste tyres, glass, plastic and paper, there is real opportunity to be gained from advancing the capacity of the local resource recovery sector to step up to the plate.

Our sector is already showing real leadership in the production of world-class products from recycled materials and is actively seeking strategic growth opportunities to advance sustainable solutions to Australia's waste challenges.

The opportunities to enact real change with wide-reaching benefits are much more likely to be achieved on the back of sensible policy, a serious commitment to government procurement at all levels and sustainable funding. We take great encouragement from the federal government's more recent commitments to funding critical infrastructure projects through the $190 million Recycling Modernisation Fund and continued support for the Australian Renewable Energy Agency (ARENA), as well as the launch of the Australian Circular Economy (ACE) Centre. It provides companies like ours with the confidence to demonstrate innovation and continue to invest in projects that will ultimately boost Australia's remanufacturing capabilities and set us up for a sustainable future.

What are the three biggest challenges or threats facing your industry in 2021?

As we overcome challenges around logistics disruptions, buyers abandoning sustainability measures and the new China SWORD policy, it only reaffirms the critical importance of building sustainable domestic end-use markets. Vital to achieving that is a national strategic approach to identifying and investing in infrastructure solutions to sort, process and remanufacture materials from waste.

While the federal government has taken the lead, working alongside industry to drive the transformation of Australia's waste and recycling sector, we need all state governments to match their commitment and set bold targets for onshore recycling.

Waste must be recognised as a valuable resource and in order to keep that value in the Australian economy, we need sensible policy harmonisation to ensure a nationally consistent response, providing the certainty industry needs to back continued growth and investment.

We also need governments at all levels to show leadership in committing to bold procurement targets for the use of recycled material. In using their extensive purchasing power, governments can have a significant impact on creating a demand-driven transition to a circular economy.

What sustainability strategies will be at the forefront for your business in 2021?

Economic viability, environmental sustainability and social equality will be at the forefront of our business in 2021. As a responsible global leader in the recovery and remanufacturing of primary resources, we believe we have an obligation to leave the planet in a better shape than we found it.

We have ambitious plans to grow the ResourceCo business and to continue to invest and innovate, making sure the planet's limited resources are safeguarded for future generations. We are committed to expanding our focus on providing a safer and better environment for communities, by partnering with them to build a sustainable future.

As a natural extension of our core environmental and recycling platforms, we have a strong presence in the delivery of carbon abatement solutions for end use by Australian businesses and we continue to work with our key partners and customers to find opportunities to significantly reduce greenhouse gas emissions.

The health and welfare of not only our 700-strong workforce, but also those people who interact within our supply chain globally, remains a core focus of our business, which is committed to supporting partners and suppliers who can demonstrate ethical business practices.

As Australia progresses in its transition to a circular economy, we all have a role to play in championing positive society-wide benefits.

Simon Brown, Founder and Managing Director, ResourceCo, is an innovator and visionary; he is one of the pioneers of repurposing of waste in Australia and remains a passionate leader in the progression of a circular economy. Simon's ability to identify and forge key strategic ventures has underpinned ResourceCo's growth as one of Australia's leading remanufacturing companies.

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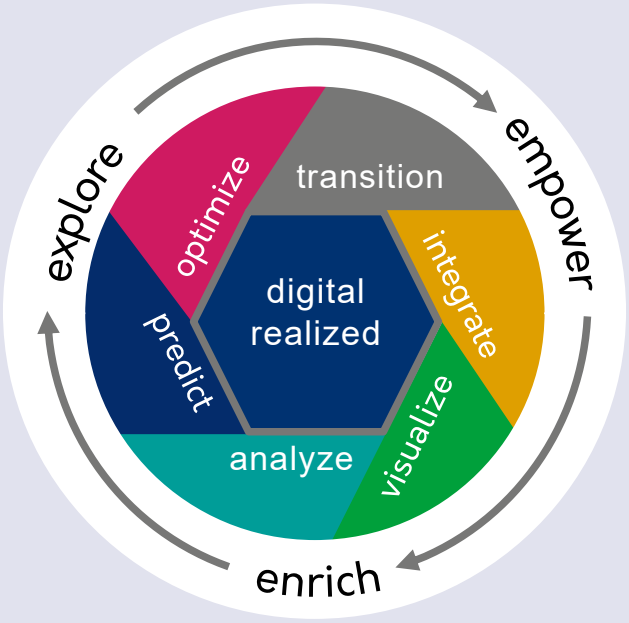

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ARMIN FAHNLE

MANAGING DIRECTOR, ATS GLOBAL AUSTRALIA AND INDONESIA

What opportunities do you predict for growth in your industry in 2021?

A 2018 PwC study of CEOs found that 74% of CEOs see driving operational efficiency as a priority. To this end, many manufacturing businesses have engaged in digital transformation by focusing on improving IT infrastructure and consumer-facing systems over the last decade.

There is now growing interest in what digital transformation means for the factory floor as manufacturers need to become more agile, more productive and more innovative. Agility and productivity should be the end goal to improve the ability for manufacturers to meet market demand competitively. Innovation is a key success factor in long-term sustainability and positively correlated with shareholder returns.

For many, this challenge can be met by realising a transition from disconnected islands of paper-driven manufacturing process management and isolated software applications to digitally operated and digitally connected manufacturing systems that integrate both manufacturing plant and IT systems with operations planning, execution and analysis in a seamless way.

ATS Global works with manufacturers to apply a range of digital technologies and our experience to build digital solutions. In response to supply chain issues I expect to see opportunities to support manufacturers to re-think how they manage their manufacturing operations and how they can commence or accelerate a process of digital transition that can target high-priority opportunities for 'quick wins'.

What are the biggest challenges and threats facing your industry in 2021?

A major challenge over the last two decades has been the lack of genuine productivity growth in manufacturing. The gains in labour productivity due to increased capital intensity have been offset by the cost of that capital investment so that multi-factor productivity has barely moved. Limiting the aspiration of investment to labour savings, a purely financially driven perspective, overlooks the opportunity for manufacturers to be truly innovative, find new business opportunities and adopt new business models.

The question I often ask is: can Australia rebuild a culture that values manufacturing? Can we rebuild a community of industrialists — owners and executives — who have a passion for making things, rather than taking things? Is it possible for publicly owned companies to make the long-term investments in technology, innovation, skills and expertise that are typical of the large privately held Mittelstand in Germany? And has the loss of engineering expertise from public boards created an unsustainable focus on finance and risk rather than wealth creation?

What impact has COVID-19 had on your industry and your business strategies for 2021?

As an automation and manufacturing software business we have been able to do most of what we normally do, working from home, during 2020. Most of our customers have continued operations and we have been permitted to work on-site, when necessary.

Remote access has been important, but in most cases was already in place. The most difficult challenge has been commissioning from home rather than on-site — nothing is as good as being 'on the spot'.

There is no doubt, however, that there are limits to working from home and there is a significant impact on the sense of being a team and the effectiveness and fluidity of collaboration that is so essential to quality engineering and innovation.

What are your thoughts about the post-COVID-19 'new normal' in relation to remote working technologies and supporting staff?

As we move to COVID-normal we will continue to refine our remote working processes. We have created regular online gatherings of smaller teams that allow for unstructured interaction so that there is an aspect of sharing excitement at what's happening in our lives, what challenges are troubling us in our work, and how we can support each other.

Although we will return to the office, we have all come to better appreciate the potential for loneliness and abandonment that people working from home may feel. Our mental health and motivation are priorities and we look to come out of the other side of the pandemic as an organisation that communicates better than it did and supports every team member well.

How is your industry preparing for AI developments or advanced manufacturing?

AI is certainly starting to make an impact amongst ATS Global customers. The challenge we see with AI is one of confidence in what it produces. It is that it is often difficult to understand how the AI makes its decision and difficult to build confidence that the decision is reliable.

ATS has a collaboration with Rulex, which has developed Explainable Artificial Intelligence that makes room for creativity, human knowledge and collaboration. I expect that artificial intelligence that can be explained and behave like a member of a team will begin to win more confidence in the core technology and improve adoption.

For our business there are applications in supply chain activities like scheduling, in process performance optimisation, and in general manufacturing decision support that we have already seen produce substantially performance improvements.

Armin Fahnle manages ATS Global B.V. in Australia and Indonesia. He has four decades of experience in AI, automation and system integration and has been an active promoter of Industry 4.0 with a passion for the renewal of the manufacturing industry in Australia.

TESYS ISLAND — A SMART, NEW LOAD MANAGEMENT SYSTEM

Schneider Electric's TeSys island is a smart, digital multifunctional load management system. Designed to prevent unplanned stoppage, it can switch, protect and manage motors and other electrical loads of up to 80 A in an electrical control panel. Fully digital, TeSys island gives users easy and remote access to predictive application data, leading to early diagnostics and preventative maintenance. For system integrators and end-users, this enables better equipment management and detection of potential faults before any costly breakdowns occur.

Easy to use

TeSys island is easy to install with simple plug-and-play wiring for fast connection. Once installed, embedded algorithms detect abnormal load behaviours and generate alarms before the abnormality becomes a problem and production is forced to stop. Pre-trip warnings can also be set on the system for scheduled maintenance, and predictive alarms provide users with more information about application status so they can take appropriate actions to avoid machine outages. For example, users can identify issues such as starter end-of-life, problems with motors, poor ventilation and reverse wiring. Users can also monitor energy at the load level, easily check health status, troubleshoot and diagnose issues and take action either on site or remotely. To enable this smart system to control loads independently from the PLC, TeSys island also has an autonomous mode option.

TeSys island encompasses the complete lifecycle of the machine by connecting to Schneider Electric's EcoStruxure machine architectures, connecting to edge control, apps analytics and services. It improves full system performance through remote monitoring and leverages digital insight to avoid the risk of machine stoppages. TeSys island can also be integrated into third-party automation solutions with open communications via fieldbuses such as EtherNet/IP, Modbus TCP, Profinet and Profibus. Along with this access, TeSys island also has the highest cybersecurity and safety levels embedded into the system.

Uses across all segments and industries

TeSys island for food and beverage

At a spring water bottling facility in the USA, TeSys island is being used to help fill 45,000 bottles of water every hour. The food and beverage operator was having problems with their previous electrical system and needed a solution that would help them reduce downtime through access to relevant data for troubleshooting. They were also looking to increase efficiency for maintenance personnel and to move to a more digitised system.

Integrating TeSys island digital load management system into the solution has meant the customer has been able to utilise data that indicates warnings, protections and load tripping. It also lets them monitor energy levels and to remotely troubleshoot problems that come to hand. Operators can also run testing and visualisation exercises remotely on their smart phone with the Operation and Maintenance tool.

Manufacturing and automation

At Israel's largest manufacturer of canned fruit and vegetables, TeSys island helped to simplify installation and operations. Designed to reduce wiring and enable EtherNet/IP communication, this load management system generated space savings and allowed operators to easily control systems. Integration with third-party PLCs and software as well as remote management options also meant that TeSys island provided operators with greater flexibility and control.

The best option for mining

When a large mining customer in Australia required a new ore sampler to be built, electrical protection within the switchboard was needed. Looking for a digital load management system that would provide them analytics and remote communications, the switchboard builder requested TeSys island.

Although it is designed to provide protection, analytics and management for up to 10 motors, the mining site application required the switchboard to be built in Form 4, meaning each motor needed to be protected and controlled from its own module within the switchboard. This equated to duplicating each TeSys island's EtherNet/IP module, digital, analog and power monitoring modules for each of the 10 motors. The configuration, even in duplication by a factor of 10, proved to be more than economical due to TeSys island's time-saving features, which meant a reduction in time-to-market and faster machine integration.

More applications in conveying and pumping

In applications where conveyor belts are being used, TeSys island can secure systems and provide early indication of a potential broken belt or excess loading. With customisable warning levels, TeSys island can help maintain uptime by speeding up troubleshooting. Through the Conveying avatar, TeSys island detects issues to protect conveyers and optimise equipment lifetime. Some common issues that can be detected include belt breakage or slippage, excess loading, and any excess material preventing rotation. To simplify commissioning and maintenance, users can also access conveyor information remotely.

In a pumping application, TeSys island can help detect early indications of potential dry running or cavitation in the pump. With predictive alarms, TeSys island can also help users become more informed with pump status and take appropriate actions to avoid machine outage — thereby detecting pump issues without the need of traditional sensors. With the Pumping avatar, TeSys island can identify issues such as low or no flow, debris on the impeller, debris that prevents rotation, deadline detection, reverse flow and leakage.

For more information about TeSys island, visit se.com/au/tesysisland or speak with a local Schneider Electric representative

Schneider Electric
www.se.com/au/en

Life Is On Schneider Electric

Sunlight-powered tech desalinates water in <30 min

An international team of researchers has transformed brackish water and sea water into safe, clean drinking water in less than 30 minutes using metal–organic frameworks (MOFs) and sunlight.

MOFs are a class of compounds consisting of metal ions that form a crystalline material with the largest surface area of any material known.

Led by Monash University, the research team created a dedicated MOF called PSP-MIL-53 — synthesised by introducing poly(spiropyran acrylate) (PSP) into the pores of MIL-53, a specialised MOF known for its breathing effects and transitions upon the adsorption of molecules such as water and carbon dioxide.

PSP-MIL-53 filtered harmful particles from water and generated 139.5 L of clean water per kilogram of MOF per day, with low energy consumption. This was from desalinating 2233 ppm water sourced from a river, lake or aquifer. The research was published in *Nature Sustainability*.

Lead author Professor Huanting Wang from Monash University's Department of Chemical Engineering said the work opened up a new direction for designing stimuli-responsive materials for energy-efficient and sustainable desalination and water purification.

"Desalination has been used to address escalating water shortages globally. Due to the availability of brackish water and sea water, and because desalination processes are reliable, treated water can be integrated within existing aquatic systems with minimal health risks," Professor Wang said.

"But thermal desalination processes by evaporation are energy-intensive, and other technologies, such as reverse osmosis, ha[ve] a number of drawbacks, including high energy consumption and chemical usage in membrane cleaning and dechlorination.

"Sunlight is the most abundant and renewable source of energy on Earth. Our development of a new adsorbent-based desalination process through the use of sunlight for regeneration provides an energy-efficient and environmentally-sustainable solution for desalination.

"This study has successfully demonstrated that the photoresponsive MOFs are a promising, energy-efficient and sustainable adsorbent for desalination," Professor Wang said.

NEW PRODUCTS

IP-RATED RACKS

CERTECH IP-rated racks are designed to protect sensitive network equipment from harsh environments where equipment may be exposed to dust or water. CERTECH IP45 & IP65 rated racks are tough and robust, available in wall-mounted and free-standing options.

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CERTECH racks are covered by a 2-year warranty, subject to use within the static loading specifications and operation within normal environmental conditions.

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Airport PFAS water treatment plant powered by solar

Environmental services provider Enviropacific has completed construction of an innovative water treatment facility at Melbourne Airport to tackle per- and poly-fluorinated alkyl substance (PFAS) contamination. Powered by solar energy, the facility will allow PFAS-impacted soils generated from onsite projects to be safely managed and stored for future reuse.

Designed, built and operated by Enviropacific, the PFAS Water Treatment Plant will enable the airport to treat water runoff from onsite projects. The treated water can be reused for dust suppression, irrigation and maintenance activities across the airport estate.

Enviropacific CEO David Tucker said the project is significant.

"Cleaning up legacy issues anywhere is important, but this was a high-profile project, given its location and purpose. But what makes it more unique is that this is first time we have powered a water treatment plant of this size using 100% solar," he said.

The plant uses 252 395 W Canadian solar panels with 140 kW battery storage to create the necessary power to ensure the system can operate off-grid.

Project Director Tom O'Callaghan said the solar option has resulted in significant time and cost savings.

"This has been a great initiative — it has proved to be the most cost-effective energy delivery option for the project, while also adding the obvious environmental benefits.

"So far, in the first five weeks of operation, we have treated 860,000 litres of PFAS-contaminated water and slurry," O'Callaghan said.

The solar array complements two others at Melbourne Airport and is another example of the airport's commitment to minimise carbon emissions.

Enviropacific Services
www.enviropacific.com.au

EMERGENCY RESPONSE EQUIPMENT

Lampo units from Hydro Innovations are trailer-mounted, multi-purpose machines designed to speed up and simplify the deployment of emergency response equipment for municipalities, emergency services and contractors.

The objective of the Lampo is to enable deployment of multiple pieces of equipment, using only one vehicle.

The central components of the Lampo — the power generator and variable speed drive — are housed in an acoustically rated enclosure. The Lampo multipurpose units are then mounted on an Australian-built heavy-duty trailer and fitted with a self-priming Gorman-Rupp trash pump.

The Lampo units come standard with an air compressor, discharge hose reel, suction hoses, lighting system and a robust mounted tool box.

The units can be configured to suit individual needs and applications, including different size and type of pumps, different size compressors and a variety of additional equipment designed to accommodate individual requirements.

Hydro Innovations

www.hydroinnovations.com.au

CLOUD-BASED BUILDING CONTROL

Intesis ST Cloud Control is a cloud-based solution from HMS that enables easy monitoring and control of any BACnet or Modbus device from an end user-oriented app and a web-based dashboard.

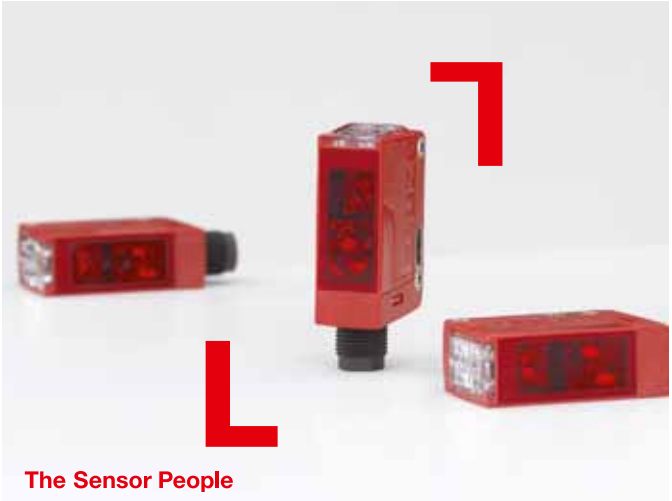
Intesis ST Cloud Control uses HMS Hub for communication between connected devices and the cloud interface, utilising an edge connectivity solution by HMS Networks — which is now also brought to the building management arena to ensure safe and secure transformation of information.

The flexibility and scalability of the platform allows users to integrate as many variables as needed on an unlimited number of devices, providing a user-friendly Android and iOS app for users to have on hand control. Users simply install the ST Cloud Control gateway in the desired location and use Intesis MAPS for PC-based configuration. Here, the desired widgets can be created (eg, Booleans, Operating Modes, Dimmers, Analog Values, Error Signals, etc), after which they can be mapped with the BACnet objects or Modbus registers of choice.

After configuration, all widgets will appear automatically in the app and web interface, provided in a safe and secure way via the HMS Hub Edge Connectivity solution for BACnet IP/MSTP or Modbus TCP/RTU devices. Up to 32 devices can be connected to each gateway, with up to 12 widgets per device. Users can create scenes and interact with multiple concurrent devices. A calendar shows the daily planned installation commands and notifications keep users updated about system status. Device sharing and user permissions management is available from a common dashboard.

Global M2M

www.globalm2m.com.au



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AVERAGING PITOT TUBES

The McMenon MAPT is a multiport self-averaging flow meter with a design based on the classical pitot tube concept of fluid flow measurement. It produces an averaged differential pressure (DP) signal proportional to the square of the flow rate. The DP output is normally piped to a differential pressure transmitter in order to generate an electrical signal proportional to the flow rate.

The outer impact tube has a number of pressure sensing holes facing upstream that are positioned in accordance with a log-linear distribution. The 'total pressures' developed at each upstream hole by sum of the impact of the flowing medium and the static pressure are firstly averaged within the outer impact tube and then more accurately averaged within the internal averaging tube. This pressure is represented at the head as the high-pressure component of the DP output. The low-pressure component is generated from a single sensing hole located on the downstream side of the outer impact tube, measuring static pressure. For bidirectional flow measurement, the MAPT can be supplied with the same number of downstream ports as upstream. The MAPT is an improvement on the round sensor design due to profiled flats positioned around the downstream hole in order to define the point at which the flow lines separate as the fluid passes around the outer impact tube. This creates a stable pressure area at the downstream pressure sensing hole, maintaining a more constant flow coefficient at high velocities and enabling a very wide range of flow measurement.

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NEW PRODUCTS

MODULAR I/O SYSTEM

Weidmüller's u-remote compact distributed I/O platform offers a streamlined design while providing features such as hot-swappable slices, an integrated self-configuring web server interface and simple plug-in connections.

The u-remote platform is a solution that's built for faster installation and set-up, and designed to improve performance and productivity. At 11.5 mm wide per modular slice, its slim design gives it a high-channel density.

Being vendor-neutral, it supports integration with all major fieldbus networks including EtherNet/IP, Profinet, EtherCAT and Modbus TCP for seamless compatibility with existing plant and machine networks.

An integrated web server helps speed up installation and provides real-time diagnostic access to up to 64 connected I/O slices or cards. Its high-speed system bus also provides high performance and works with as many as 256 DI/DOs in a 20 μs cycle time.

Weidmuller Pty Ltd

www.weidmuller.com.au

DISTRIBUTION BOARDS

Following the launch of the APS DB Ultimate, APS Industrial has released the second range within the 'DB' family, the APS DB Essential.

Consistent throughout the DB family of distribution boards, the Essential is custom designed for the demands of Australian industry, and is purpose built for compatibility with Siemens circuit breakers.

The DB Essential has been developed as a lightweight distribution board for high-end commercial and medium-duty industrial environments. The enclosure by KATKO is a fully welded construction and meets the highest IK rating against external mechanical impacts while maintaining an IP55 ingress rating.

Together, these ratings make this range of distribution boards suitable for indoor and outdoor applications typically seen in office, retail, hotel warehouse and distribution applications.

While the DB Essential does not offer a removable gear tray (as featured in the DB Ultimate), the DB Essential does offer flexibility in equipment options thanks to careful design considerations and a range of features which include IP55/IK10 KATKO enclosure; dual quarter-turn locking system; removable hinged escutcheon and door; continuous poured door seal; galvanised gear plate; dual earth neutral bars; and a removable gland plate (top).

APS Industrial

www.apsindustrial.com.au

MEGOHMMETER

The AEMC megohmmeter model 6524 is suitable for testing cables, small motors, pumps, transformers and industrial equipment. It offers insulation test voltage selection from 50 to 1000 V. It also offers DAR and PI ratio tests, with insulation resistance up to 200 GΩ.

Other features include a timed test mode up to 40 min for an insulation resistance test; test lock feature for hands-free timed measurements up to 15 minutes; and continuity tests at 20 or 200 mA.

The product also offers test lead resistance compensation for low resistance measurements; true RMS AC/DC voltmeter up to 700 V; ohmmeter to 1000 kΩ; frequency measurements from 15 to 800 Hz; auto discharge after insulation test; and hold function to 'freeze' readings.

The megohmmeter features a large and bright dual display with blue backlight, as well as an auto standby feature triggered by inactivity, which saves on battery power.

AEMC Instruments

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MARK FERGUSON

CEO, KAISHAN AUSTRALIA

What opportunities do you predict for the growth of your industry in 2021?

With a renewed emphasis on local manufacture, it is anticipated there will be an increased demand for economical, sustainable compressed air generation to power machinery and tools across a wide variety of industries. Opportunities in manufacturing of scientific instruments, new age technologies and equipment, and a return to homegrown design and engineering will foster the need for new generation, highly efficient air compressors and ancillary equipment.

With the growth of new industries will come the need for existing manufacturers to upgrade their equipment to the new world standards required to compete on both the local and international markets.

With energy costs rising constantly, compressed-air-reliant industries will need to lower the cost of energy input whilst maintaining or increasing compressed air power output. This will be achieved by upgrading outdated equipment by offsetting capital expenditure with massive energy savings over years of operations.

We at Kaishan Australia are at the forefront in the supply and servicing of super energy-efficient air compressors for all types and sizes of industry over a wide range of applications.

Our support and service teams are primed for a high demand in new equipment installations and regular service programs that maintain compressed air systems at peak operating efficiencies. These highly trained specialists have the experience and know-how to maximise operating efficiencies in virtually any type or brand of air compressor and system.

What are the three biggest challenges or threats facing your industry in 2021?

1. Finding the right people to lead our industry into this new decade. From experienced and entrepreneurial managements to highly trained support and service technicians who can keep pace with the latest energy-saving engineering and technologies.
2. Continuing to research and develop ever more efficient compressors and system components that will keep pace with the demands of industry in a world that is experiencing energy shortages and ever increasing costs.
3. Keeping in tune with industry developments so as to predict and cater to the changing needs of Australian industry. We need to be proactive rather than reactive to growth and change.

What impact has the COVID-19 global pandemic had on your industry and how does this affect your business strategies for 2021?

Obviously, the restrictions placed on industry with reduced workforce, greatly changed working conditions and operating limitations for our own business have affected our bottom line. More importantly the effect on our client companies and general suppression of business expansion has reduced the demand for our products, particularly in the smaller business sector.

Whilst some companies saw complete or partial shutdown as an opportunity to upgrade or service existing equipment, our service division continued to operate utilising strictly COVID-safe procedures on a 24/7 basis to solve problems swiftly and keep clients operational at the highest efficiency possible.

We have planned to operate at maximum possible capacity with finely tuned contingency strategies which can quickly be implemented should COVID restrictions or lockdowns re-occur. We have re-assessed our future strategies to include rapid response to any predictable future conditions to ensure we maintain a supply chain and service protocol that ensures our clients receive the highest quality of product and support possible.

How has the current international uncertainty impacted your cybersecurity and/or supply chain management plans for 2021?

Being a largely autonomous Australian contingent of a leading global corporation with manufacturing plants and offices throughout the world, we are confident that the Kaishan group and our integrated strategies and systems are prepared for any contingency that may threaten.

Whilst we are aware of international political influences affecting world markets, our position as a market leader in the Australian compressed air industry employing a large national workforce is one of continuing to develop and service Australian industry. Formerly operating as Southern Cross Australia Pty Ltd with over 40 years' experience in supply and service of high-quality air compressors and service, now as Kaishan Australia we are in a far stronger and stable position to supply and service Australian industry.

What are your thoughts about the post COVID-19 'new normal' in relation to remote working technologies and supporting staff?

As a supplier of energy-efficient air compressors and systems, we are well prepared to face the changes of COVID-normal conditions. Whilst it is preferred that our workforce can now operate close to normal, we can operate with remote staff connections particularly in the sales and marketing areas. Our tech service teams are fully equipped and stocked to operate with minimal office interaction. Kaishan Australia will always support its staff to remain as safe and efficient as possible until we can drop the COVID from 'normal'.

For over 30 years Mark Ferguson has worked with a myriad of compressed air equipment applications across Australia. Starting in the industry as a Graduate Engineer, Mark has been involved in all aspects of compressed air including sales and marketing, design and manufacture through to business leadership. "It has been an amazing journey through an incredible number of industries and applications and I've never lost the passion for what I do."

Controlling aim points for heliostat fields in operation

Among solar thermal power plants, solar tower systems are considered to have the greatest potential in terms of efficiency and cost reduction. In particular, costs can be saved on mirrors (heliostats), which account for between 30 and 40 per cent of the investment. However, frequent calibration or control of the heliostat aim points is required. In the HelioControl project, the Fraunhofer Institute for Solar Energy Systems ISE developed a calibration and control system based on digital image processing for heliostat fields. With this method, the aim points of many heliostats can be determined during operation in a timely and cost-efficient manner.

In concentrated solar thermal tower power plants, there can be several hundreds, tens of thousands or even a hundred thousand mirrors that concentrate the sun's rays onto a central absorber (receiver) at the top of a centrally located tower. The generated heat is transferred to a heat transfer medium (such as molten salt), which is used to generate steam and drive a turbine. In conjunction with a thermal storage unit, the stored heat can also be used to generate electricity at night.

Since the mirrors tracking the sun reflect the radiation over distances of up to one kilometre, even small angular deviations of aim points leads to large losses in power plant efficiency. Although the control system sets the mirror position using a sun-tracking algorithm, it is not known whether deviations between the targeted and actual coordinates exist or how large these deviations may be during operation. During power plant construction, the heliostats are precisely aligned and then they are regularly recalibrated and adjusted via control parameters during operation. This measure, however, demands considerable time and cost for power plant operators, especially with large heliostat fields with many thousands of mirrors. When calibration procedures require reduced effort or are carried out with a closed-loop control, cost reduction potentials can be expected through savings in the structure or drive system.

The goal of the HelioControl project, which was funded by the German Federal Ministry for Economic Affairs and Energy BMWi, was to develop an efficient camera-based calibration and control system for heliostat fields.

During operation, the aim points of individual mirrors are identified from the total concentrated flux density distribution. A video of the irradiated receiver is recorded with a camera. By modulating a periodic movement of the mirror, a signature is introduced into the flux density distribution at the receiver, which can be associated to the individual mirror and its contribution. By using different frequencies, the aim points of several mirrors can be determined simultaneously.

"Using digital image processing, the actual aim point of the heliostat is determined," explained Dr Gregor Bern, Project Manager at Fraunhofer ISE. "If this deviates from the targeted aim point, the values are transferred to the heliostat control for correction."

For the new method, the Fraunhofer ISE project team developed software that allows aim points to be measured in parallel during operation. After laboratory testing, the system was deployed in the heliostat field at the Themis tower power plant in France. The results are promising. The aim points determined from the images are usually only a few millimetres from the actual aim point. The closed-loop control circuit was also successfully demonstrated.

"Theoretically up to two heliostats per second can be measured in parallel with the HelioControl system. This means that a power plant the size of Noor III in Morocco with 7400 individual heliostats can be recalibrated in less than one hour instead of several weeks as was previously the case," Bern said.

By measuring the aim points and making a corresponding readjustment, the demands on the intrinsic precision of the drives and on the gear backlash in the power transmission are reduced. The precise and homogeneous alignment of the aim points also avoids so-called "hot spots" — local regions with excessive temperature — which can cause severe damage to the receiver. This increases both the lifetime and the thermal efficiency of the receiver, as it can be operated closer to maximum temperature.

Using simulation models, the project team calculated measurement speed, potential savings and possibly increased operating consumptions of the heliostat motors. The researchers calculated a savings potential in the field of at least 5% for a reference model. This is a considerable amount in view of investments of several hundred million euros for a power plant.

Since the HelioControl algorithm uses industry-standard interfaces, it can be easily integrated into existing power plants. It can also be used for the optimal calibration of heliostats during power plant construction. The Fraunhofer ISE project team is presently looking for further partners for demonstration and commercial application of this approach in large tower power plants.

Fraunhofer Institue for Solar Energy Systems ISE
www.ise.fraunhofer.de/en.html

PORTABLE NETWORK TESTER

Anritsu introduces the Network Master Pro MT1040A, a portable 400G network tester for evaluating the transmission quality of networks operating at speeds ranging from 10 Mbps to 400 Gbps. Featuring a compact design, ease of use and broad test capabilities, the MT1040A can be used to efficiently and confidently install, maintain and troubleshoot communications devices, transceivers, cables, networks and data centres up to 400 Gbps.

Directly inserted next-generation QSFP-DD and OSFP multi-rate modules and break-out cables up to 400G with native SFP+/SFP28, QSFP and OSFP interfaces allow the Network Master Pro MT1040A to perform forward error correction (FEC) verification, Bit Error Rate, throughput and latency measurements. These tests verify performance of high-speed network cables and devices; private and distributive networks; access, metro and core network segments; mobile edge computing, and data centre TOR/COR equipment addressing new 5G application services. Communications carriers, network installation and maintenance companies, and back office and data centre personnel can use the tester to ensure the transmission quality of 400G Ethernet, OTN, eCPRI/RoE/CPRI/OBSAI and Fibre Channel networks and elements.

The Network Master Pro MT1040A has a built-in 400G Ethernet FEC analysis function for quality evaluations of QSFP-DD and OSFP optical modules and 400G devices and equipment. Additionally, the MT1040A can be configured with compatible OTDR modules to simultaneously conduct optical line measurements to troubleshoot optical fibre faults.

Throughput and latency measurements between two remote points using GPS can be achieved by linking dual MT1040A instruments — one as a local and another as a remote. Using this functionality, uplink communications speed can be measured by the local tester while simultaneous and accurate analysis of the downlink communications speed is done by the remote unit.

Designed for today's installation and maintenance (I&M) environments, the battery-powered MT1040A has a large 9″ touch panel for good operability. Measurements are simplified by a built-in remote control over network capability, as well as automatic test functions and multiple pass/fail evaluations that can be performed by pressing a single button.

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Transforming the electrical wholesale industry

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With COVID-19 restrictions reducing opportunities for in-store interactions, the electrical wholesale industry has had to rethink the way in which it operates.

Many electrical retailers are now relying more heavily on online and phone-based connections to maintain proximity with their customer base.

One such electrical wholesaler, which has successfully transformed into a multi-channel customer service operation, is JH Market.

JH Market operates a marketplace for products sourced globally that are designed, tested and certified to Australian standards. The business is almost 25 years old and has grown from a small walk-in store to an industry-leading supplier of lighting and electrical products with branches in Victoria and Queensland. It supports a 12,000-strong trade customer base and is currently diversifying with a focus on new customer acquisition and expansion into South Australia.

"It's pretty rare in our industry to have a phone-based sales team and multi-channel support for customers," said Michael Gonsalvez, JH Market's Chief Experience Officer.

"Most of our industry is still reliant on physical showrooms, with sales interactions and pickups in store."

The business already operated with most of its IT infrastructure in the cloud, so when it moved to a new office in late 2019 and its on-premise phone system contract went up for renewal, RingCentral was chosen from a shortlist of cloud communications solutions which also had outbound dialler capabilities.

According to Gonsalvez, part of JH Market's vision was to 'turbo charge' account management with much more targeted and relevant outbound sales calls and interaction with their customers. Rather than each salesperson calling down a list of their trade contacts, JH Market has integrated customer scoring data from its e-commerce platform with other customer data analytics, including buying history and contact rates, using data science to predict the optimal times to be calling each customer on particular campaigns or regular catch-ups.

When the first COVID-19 lockdown came into effect in March, JH Market already had its new RingCentral Office and Contact Centre communications solution, e-commerce site and account management operations in place, so it was quite straightforward to revert to a work from home model for all back-office staff.

"Using RingCentral, we have daily video stand-ups with our marketing, data, product and development teams, and weekly all-staff meetings. It's great to collaborate with Atlassian and Trello, but nothing beats a video or phone call," Gonsalvez said.

JH Market has been able to keep its Victorian showrooms open just for trade customers, with the building and construction industry continuing to operate through the pandemic. However, there has been a significant overall slowdown of work with a sizeable reduction in JH Market's average customer order size, which is being reflected throughout the industry. Despite this, JH Market has seen an increase in overall efficiencies in the sales process, online and phone-based sales, and frequency of orders that has insulated the business from any COVID-19 impact, and ideally positioned JH Market to respond quickly when the market rebounds post-pandemic.

There are a number of customer experience innovations in the works. JH Market has just launched RingCentral Live-chat on its website and plans to increase its omni-channel connections with customers.

"There's a lot more potential in e-commerce business across Australia, so we will be looking to increase diversification by further integration of our different customer engagement channels and introducing more online campaigns through the use of eDMs and social media," Gonsalvez said.

RingCentral Australia
www.ringcentral.com.au

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The P1AM-100 CPU supports the full suite of Productivity1000 I/O expansion modules, including: discrete, analog, temperature, relay, high-speed input, pulse-width modulation.

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THERMAL FLOW METERS FOR WASTE-TO-ENERGY

The ST80, ST100 and MT100 Thermal Mass Flow Meters from Fluid Components International (FCI) are designed to offer accuracy, repeatability, ease of operation, installation and low maintenance to enhance plant performance while driving costs down in waste-to-energy incineration plants.

Waste incineration plants (WIP) applying waste-to-energy (WTE) technologies provide an economical and decreased waste footprint alternative to conventional organic waste disposal. WIPs convert their waste streams into electrical power by burning the waste to heat steam boilers, which in turn drive turbine electric power generators.

The WIP combustion process uses forced draft primary air and grate air, and in some systems secondary air, that all must be measured for efficient mixing and boiler control. All WIP systems require the measurement of the air mass flow rate to control the boiler properly and treat end-of-process hot flue gases.

FCI's ST80, ST100 and MT100 Series Thermal Mass Flow Meters are used for measuring WIP boiler system intake air and back-end flue gases. The meters are suitable for use in high-temperature, dirty plants with fly ash residue, due to their rugged, no-moving parts design that is resistant to clogging and fouling over a long life.

FCI's compact thermal dispersion mass flow meters are direct mass flow instruments that do not require the addition of costly temperature or pressure sensors, or their added wire-runs and pipe penetrations. Their insertion-style configuration provides an easy, cost-effective solution to install for the larger line sizes common in waste-to-energy incineration plants.

Typical WIP requirements that FCI meters meet include pipe diameters that range in diameter or square/rectangle sizes from 200 to 2500 mm, temperatures of 0 to 260°C and pressures of 0.05 bar [g].

AMS Instrumentation & Calibration Pty Ltd
www.ams-ic.com.au

MOBILE TOOL CASE

The XXL III electric tool case from Wiha features large, specially designed wheels that allow it to easily roll over steps or rough terrain, overcoming obstacles frequently encountered on worksites. The case also features strong legs and an extendable step, allowing it to be used as a mobile mounting aid or for accessing difficult locations including ceilings and elevated spaces.

Two recessed notches in the case lid serve as a sawing aid and cutting cable ducts, pipes or rods to length is simplified thanks to the integrated ruler. Positioning the case on the four unfolded legs ensures a much more convenient, efficient and ergonomic working position, as users no longer have to bend down to the floor to get the tools. Shock absorbers prevent unintentional closing of the case lid and lower the risk of crushed fingers.

The tool case includes familiar tools for the electrical trade including voltage-proof screwdrivers, plier solutions, automatic crimping and stripping tools and special hand tools including a spirit level. It additionally includes a hacksaw, a multifunctional flashlight and electrician's hammer. The 32-piece slimVario electric set is also included.

Premium Tools
www.wiha.com

ELECTRICAL TESTER

The Fluke T6-1000 PRO electrical tester measures voltage up to 1000 V AC and current up to 200 A AC, all through the open fork and without test lead contact to live voltage. It saves time by displaying voltage and current measurements concurrently and utilises Visual Continuity technology, automatically turning the screen green for continuity — a useful feature in noisy environments where it's too loud to hear the beeper.

The T6-1000 PRO features true-RMS, helping to provide accurate voltage and current measurements, even when measuring complex signals.

Fluke Australia Pty Ltd
www.fluke.com.au

LASER SCANNER

The Micro Epsilon scanCONTROL 30xx/BL laser scanner is designed for dynamic measurement applications that require a system with high resolution and accuracy. It is primarily used for process automation tasks, but can also be applied in production, process monitoring and quality control. The scanCONTROL 30xx/BL is also integrated with a High Dynamic Range (HDR) feature that offers additional exposure and control features for generating accurate measurements on challenging surfaces.

The scanner is available with a measuring range of 25 and 50 mm along the laser line with a capability to measure up to 5.5 million points per second and generate up to 2048 measuring points per profile. This translates to a fine x-axis resolution of 12 µm, which is suitable for measuring heterogenous surfaces. The sensor also offers a high measuring speed of 10 kHz for dynamic and high-speed measurement applications.

The output values from the scanCONTROL 30xx/BL are available via an Ethernet or RS-422 interface. It is also available with an optional gateway to enable integration with other popular industrial communication interfaces such as ProfiNET, EtherCAT or EtherNet/IP industrial control systems.

The scanCONTROL 30xx/BL is also available with blue laser technology. The blue laser diode generates short-wavelength laser light that hardly penetrates the objects. This provides advantages in some measurement applications, particularly when used in measuring organic materials or objects with shiny, reflective and highly polished surfaces.

Bestech Australia Pty Ltd
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Cybersecurity is the practice of protecting networks, systems, hardware and data from digital attacks, especially for control networks, because they are the communication backbone of so many critical processes. Water and sewerage treatment, utilities, oil & gas, and industrial manufacturing all rely on networking to make everything run smoothly.

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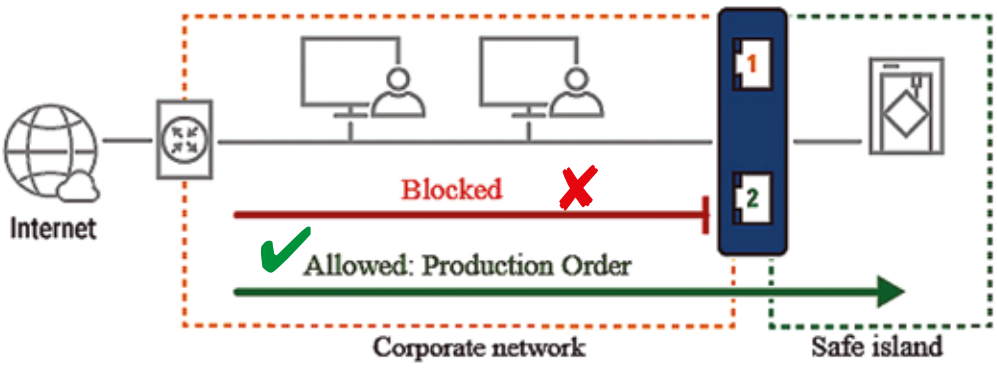

www.teautomation.com.au sales@teautomation.com.au

FANLESS BOX PC

The EPC-C301 is a compact, fanless box PC powered by an 8th Gen. Intel Core processor. The device integrates Intel and Canonical technologies, provides Ubuntu OS and OpenVINO toolkits, and is aimed at accelerating the advancement of AIoT. It supports four GbE LAN and four USB 3.2 ports and a 10 Gbps port to accommodate the IP/HD camera inputs required for AOI, APNR and other machine vision applications.

To improve expandability, the EPC-C301 features four USB 2.0 ports and four UARTs for card readers, barcode scanners, keypads, fingerprint sensors and other peripherals. The device also has two isolated CANBus ports designed for use in automation and medical applications. The solution is equipped with Windows and Linux-based drivers/APIs to improve convenience and compatibility. This combination of diverse I/O and OS makes the EPC-C301 exceedingly adaptable for a large range of applications.

The EPC-C301 includes an M.2 E-Key for Wi-Fi and Bluetooth, M.2 B-key for LTE and a mini-PCIe slot, which is compatible with Advantech's VEGA-330. This system functions in broad operating temperatures (-20 to 60°C) and is suitable for use outdoors. The EPC-C301 also features WISE-DeviceOn, an IoT device operation and management software, which enables users to integrate, visualise, operate and manage their industrial IoT devices through cloud services.

Advantech Australia Pty Ltd
www.advantech.net.au

MOBILE MIMO ANTENNAS

The Step Global LTM and LTMG Series of mobile antennas employs MIMO (multiple-input-multiple-output) technology to accommodate a range of options from 3-cable antennas to a 9-cable antenna, the LTMG-944, that contains 4 x LTE for dual-carrier Cellular MIMO, along with 4xWiFi and 1xGNSS internal elements.

All antennas come with integrated ground plane and have a very low correlation coefficient. They are built for harsh environments.

The range of elements that can be specified are: Global 5G/LTE: 617–960 MHz and 1710–6000 MHz, Global LTE: 694–4200 MHz, Wi-Fi & DSRC: 2.4–2.5 and 4.9–6.0 GHz, UHF: 450–470 MHz, GNSS: 1561, 1575 and 1602 MHz, Iridium: 1616–1626.5 MHz.

The "G" after LTM specifies GNSS — Global Navigation Satellite System. GNSS operates on GPS, Galileo, Glonass, QZSS or Beidou at 1561, 1575 and 1602 MHz. All antennas come in thru-hole or mag-mount enclosures and thru-hole can be supplied with pole mounts. All cable lengths and connector types can be customer specified.

Step Global Pty Ltd
www.stepglobal.com.au

SWITCHBOARD HOT SPOT DETECTION

Safe Connect Australia-New Zealand has released colour change clips that display and remain bright pink the moment any cable or connection becomes hot, proving a cost-effective way to permanently monitor electrical connections and components.

The simple push-on application makes it easy to retrofit to existing electrical installations or include in new projects. Unlike expensive thermal imaging, which provides a snapshot of current operating loads, the permanent colour change when a cable reaches 71°C provides an indication of all hot spot events, regardless of when they occurred.

Available in various sizes to fit all types of cables, the clips attach to the cable insulation and create no interference with electrical connections.

Safe Connect Australia-New Zealand
www.safeconnectaustralia.com.au

INTELLIGENT INFRASTRUCTURE GATEWAY

The Vertiv Liebert RDU501 is an intelligent infrastructure gateway appliance that integrates with data centre racks. It enables operators to monitor the performance of all IT assets, including thermal management units, UPS and generator sets.

The product is an upgrade to the existing Liebert RDU-A G2 appliance, and comes equipped with a web server, automated IT server shutdown and out-of-band management to enable complete control over data centre infrastructure. The appliance offers more device connections than its predecessor and also collects data from environmental sensors for enhanced infrastructure monitoring.

Vertiv Co
www.vertivco.com

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Wash-down rated Uprox Inductive sensors from Turck are ideal for liquid processing lines, in filling functions, or other types of food processing machinery to detect metal valves. Plus, IO-Link makes remote monitoring easy.

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NEW PRODUCTS

FIMER STORAGE PRODUCT AVAILABLE ON SA HOME BATTERY SCHEME

FIMER's REACT 2 residential energy storage solution has been included on the South Australian (SA) Home Battery Scheme. The SA Home Battery Scheme gives all grid-connected South Australians access to their state government subsidies and low-interest loans to help pay for a home battery system and new solar if required.

The subsidy is calculated on the kilowatt-hour capacity of the battery purchased. With a REACT 2, depending on how many battery modules are installed, home owners could save up to $4000 on a home battery installation.

"It is great to have the REACT 2 on the South Australian home battery scheme," said Jason Venning, Country Manager, FIMER Australia. "Our solution provides home owners with the choice of a high-quality hybrid inverter and modular battery system from one manufacturer with a 10-year warranty and a battery performance guarantee."

The storage solution includes a hybrid single-phase inverter available in power ratings of 3.6 and 5.0 kW. It is claimed to have one of the industry's highest energy efficiency rates, providing up to 10% more energy than lower voltage battery systems. The system is flexible and can be expanded from 4 to 12 kWh, depending on the number of batteries used, and can achieve up to 90% energy self-reliance. Available with both AC and DC side connection, the solution is suitable for both new and retrofit applications.

Alongside the SA Home Battery Scheme, the REACT 2 is also available under the Victorian battery scheme.

FIMER Australia

www.fimer.com

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AI INFERENCE PLATFORM

The Neousys Nuvo-7166GC-T4 is a ruggedised AI inference platform that features two PCIe slots to support an NVIDIA Tesla T4 inference accelerator providing 8.1 TFLOPS in FP32 and 130 TOPs in INT8 for real-time inference, based on a trained neural network model. Powered by an Intel 9th/8th-Gen Core 6/8-core CPU and 64 GB DDR4-2666, it is designed to offer an optimal balance between CPU, GPU and memory performance.

The Nuvo-7166GC-T4 Package utilises Neousys's Cassette module that has an Air Tunnel Design to guide intake air to flow through the passive heat sink of the NVIDIA Tesla T4. The Cassette module is equipped with a second fan to deliver airflow for a second performance PCIe card installation. This cooling design guarantees operating temperatures of up to 60°C with a sustained 100% CPU and GPU loading.

The system features an M.2 NVMe interface that supports ultra-fast disk access and USB 3.1 Gen2, GbE and PoE ports for data input. The Cassette module offers an additional Gen3 x8 link PCIe slot for installing a high-performance PCIe card or a variety of sensor or image acquisition cards.

Backplane Systems Technology Pty Ltd

www.backplane.com.au

THREE-PHASE HYBRID INVERTER

SolarEdge is bringing DC optimisation to the three-phase residential market in Australia with the introduction of a hybrid inverter that offers design flexibility.

With fewer, longer strings, the inverter addresses typical PV design restrictions, such as varying panel types and string lengths. Allowing for simple installation of large systems, the solution is said to reduce roof penetrations and allow for multiple orientations and tilts on the same string.

Supporting a simplified plug-and-play installation of the SolarEdge battery — when available — the hybrid inverter presents a single solution for both energy storage and on-grid PV. With easy future upgrades, such as battery storage and smart energy add-ons, the inverter further utilises excess energy production. For maximum system efficiency, the solution leverages additional power from DC oversizing up to 200% — because energy that would normally be lost in an AC-coupled solution will be redirected to a battery for optimised self-consumption and fast system ROI.

The product will be available in the 10, 8.25, 7 and 5 kW power range.

SolarEdge Technologies Inc.

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PANDEMIC PAUSE OF OUR WAR ON WASTE

*Preston Geeting**

Only eight months ago, the world was a very different place. Shoppers were beginning to bring their own bags to grocery stores and opting to use disposable products. It was evident that consumer sentiment had massively shifted and a new focus on friendly packaging solutions was emerging.

2020 was set to be the year that the 'war on plastic' would make great advances; then along came coronavirus and that all changed.

In less than a year, COVID-19 has turned our world upside down. As we all contended with the unfamiliarity that came from living in a new normal, the war on plastic took a back seat to the pandemic. The pandemic brought a tidal wave of plastic with it; plastic that filled our homes, streets, rivers and oceans.

But why did this happen?

How could a virus press pause on global sustainability goals and instead make plastic fantastic again?

1. Working from home

As workers were forced from their office cubicles to their kitchen tables, and lockdowns and quarantines ensued, life changed dramatically for everyone.

E-commerce and home delivery soared as people shopped online and ordered takeaway meals instead of dining out at restaurants and cafes. The demand for efficient and effective protective packaging was high as people sought goods that were delivered undamaged but were also safe and hygienic. The risk of surface contamination had been reported. People therefore were worried and opted for plastic covered foods and goods to ensure their products had not been touched or coughed upon by a COVID-19 infected person.

2. Disposable gloves and masks

The World Health Organization recommended the use of masks to overcome the risk of infection. Since then, many areas of the world have made wearing masks compulsory.

Sales of PPE have soared; however, the number of masks, gloves and face shields being discarded incorrectly has also soared. These items are now starting to litter our streets, beaches and oceans.

The World Wide Fund for Nature estimates that based on the number of masks being purchased currently around the globe, if only 1% of masks were discarded incorrectly and ended up as litter, this would result in 10 million masks being dumped in the environment.

3. Recycling is not possible

One of the greatest barriers to sustainability is simply not having sustainable options available. The pandemic has challenged waste reduction by removing recycling as an option.

Those who are committed to recycling have found that in many cases they are no longer allowed to due to restrictions imposed by the virus. Some coffee retailers are refusing to serve coffee in reusable cups. Some establishments are now advising customers "don't bring your own containers". Due to harsh lockdowns, charity shops and recycling depots have been closed and recycling services have been suspended.

In many cases today, even if you really want to recycle your unwanted goods and promote a circular economy, you can't.

A moral dilemma of epic proportions

Despite the evident health concerns that a global pandemic brings, consideration must to be given to the heavy burden single-use plastic packaging has on the environment. Sustainability was already a major global issue before COVID-19 and is now to a certain regard, 'on the back burner'. At what point will the focus return and if it does return, will it be too late?

Together we can

"It is tragic to see how coronavirus has impacted global health and how petrol chemical companies leveraged it to accelerate more plastic usage in order to roll back progress on plastic pollution," stated Susan Koehler, Chief Marketing Officer at Footprint, a US-based material science engineering firm focused on reducing or eliminating plastics through the development and manufacturing of revolutionary plant-based technologies.

"The pandemic has challenged people's view of sustainability because they are understandably worried about health and hygiene, but it is still possible to protect your health and the environment. There needs to be more support and education in this area. There needs to be more innovation in packaging development and collaboration between recycling companies and providers. We know that by working together we absolutely can achieve a sustainable future, for ourselves, our children and our children's children.

Getting back to where we belong

The world has changed and by now we all know that the new normal is here to stay. We might not be going back to life as we knew it just yet, but sustainable development goals for consumption and production will become a key global priority once again.

Technology is already well on its way to creating a recyclable, friendly packaging solution. It will be the most innovative companies that embrace this technology and lead the way forward in the race to protect our planet and build a more sustainable future.

**Preston Geeting is the co-founder and director of Packform, a company that aims to be a tool that allows all players in the packaging industry to achieve maximum efficiency with minimum effort. It can provide a borderless platform that allows its users to find suppliers locally, nationally or internationally.*

IP67 RUGGED GPU COMPUTERS

The Neousys SEMIL Series of fanless GPU computers features a patented system architecture, specialised chassis, custom-moulded O-ring sealed enclosure and M12 connectivity. Available with various IP rating configurations, the semi-military computers are said to offer reliability under extremely harsh conditions in chemical, food and beverage and factory environments, as well as in industrial autonomous vehicle and military applications while maintaining COTS availability. They feature MIL-STD-810G shock and vibration capability and EN 50155 railway certifications.

SEMIL supports an NVIDIA Tesla T4 or a Quadro P2200 GPU. It can operate under 100% load without the GPU throttling at up to 62°C ambient temperature. As well as being IP67 waterproof, the system is enclosed in a stainless steel and aluminium chassis for corrosion resistance.

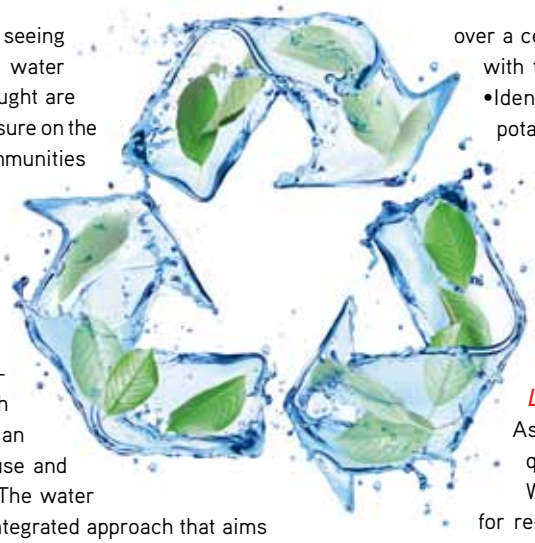
The system is also equipped with robust M12 connectors, and also comes in various form factors including 2U 19″ half-rack and full-rack form factors or with brackets for flexible rack or wall mounting. A SuperCap UPS can also be included to ensure the system continues to operate in the event of an unforeseen power outage.

Backplane Systems Technology Pty Ltd
www.backplane.com.au

OPINION

APPLYING THE CIRCULAR ECONOMY TO WATER

Kirsty Bauer, Environmental Scientist at SMEC*



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Australia, and the world, is increasingly seeing the effect of climate change on our water supply and security. Scarcity and drought are becoming more prevalent, placing pressure on the current water supply network, and communities are expecting better solutions. As we prepare for summer, it is timely to discuss how we can best utilise our existing water supplies and create a more resilient future.

The concept of a circular economy challenges the traditionally linear take-make-use-dispose behaviour on which our society is built, and envisions an economy based on regeneration, re-use and repurposing the resources we have. The water industry is increasingly adopting an integrated approach that aims to optimise the assets, improve catchment health and deliver better value for customers, but what is next?

One area which is still evolving is potable water (ie, water treated to drinking quality) being used by industry and manufacturing in situations where non-potable water would be suitable. Non-potable water is a massive resource in Australia which is generally underutilised and often literally going to waste, by being diverted to stormwater or sewage treatment plants and ultimately released into the environment.

This water is a vital part of developing a more resilient future and can be sourced from greywater harvesting, rainwater capture, from water exported from sewage treatment plants and a range of other sources (such as harvesting humidity). It presents a significant opportunity to protect our drinking water supply whilst also supporting economic growth and the environment.

A collective action plan

A collective, multi-pronged approach is required to develop a circular economy for water, to utilise potable water more effectively and efficiently whilst also better utilising existing and new non-potable water sources. There is a need to define the spectrum of water-quality requirements for different activities and their likely demands; for example, using rainwater to water gardens, top up swimming pools, suppress dust on construction sites and wash vehicles. These solutions are achievable by constructing simple community or district rainwater collection points to enable greater accessibility to this type of water supply.

An action plan for connecting the water sources with the water users is needed. Such a plan would focus on:

- The non-potable water sources available; for example, water discharged from sewage treatment plants used in irrigation schemes, and where that water could be best used to replace potable water in the first instance.
- Sources of non-potable water that could be harnessed with minimal difficulty (rainwater, for instance) and replace potable sources nearby. As an example, local government requirements for new developments with roof/stormwater drainage volumes over a certain amount to include a rainwater tank with the water used onsite.
- Identifying the highest water uses where potable water can be replaced and manage the implementation of the replacement measures.

The above approach recognises that potable water redundancy would likely be required in the transition period, but the journey towards change would have been started.

Legislation is only part of the solution

As with most water infrastructure, this requires a long-term view and commitment. Work has been done on quality requirements for re-use purposes for several decades now, and is increasingly better supported by evidence. This process has, to some extent, reached a milestone with the final documents in the National Water Quality Management Strategy's 'Australian Guidelines for Water Recycling', but legislation and planning does not always support advanced re-use.

Re-use tends to vary on a state-by-state basis — for instance, Class A re-use requirements in Victoria (which match Queensland's Class A+) are well developed. Education of authorities and developers is reasonably progressed, but there is less support for onsite re-use options such as composting toilets.

Planning and legislation need to be revised to support a nationally consistent approach coupled with effective communication, training and support of all regulatory officers tasked with assessing applications, as well as educating developers and industry.

In addition, provision must be included for future changes, which may, for instance, allow households to generate electricity, compost and re-use water of varying quality onsite, without needing to use delivery infrastructure.

Creating a water network more resilient to change

The obvious benefit to developing a circular economy for water in Australia is the development of a water network which is more resilient to change. By utilising our existing water supplies more efficiently we are creating a system which, at its core, values the water supplies and assets we already have.

Taking the concepts of a circular economy and applying them to the water industry is an opportunity to approach the required changes in a methodical and logical way. This could include prioritisation of planned investment from linear infrastructure to more resilient circular systems, ranging from small local systems to large-scale water re-use schemes.

This shift in perspective is vital; we need access to safe, secure drinking water — without it, our civilisations would not be able to exist, let alone grow. As populations continue to multiply and water supplies continue to become uncertain and decrease, water security and resilience will continue to generate national and global conversation and focused actions.

**Kirsty Bauer has extensive knowledge and experience in sustainable infrastructure projects and is a strong advocate for generational change in the implementation of sustainability. She has demonstrated expertise in professional services, across energy, carbon, environmental management, sustainability, waste and water management.*

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