Electrical Comms Data
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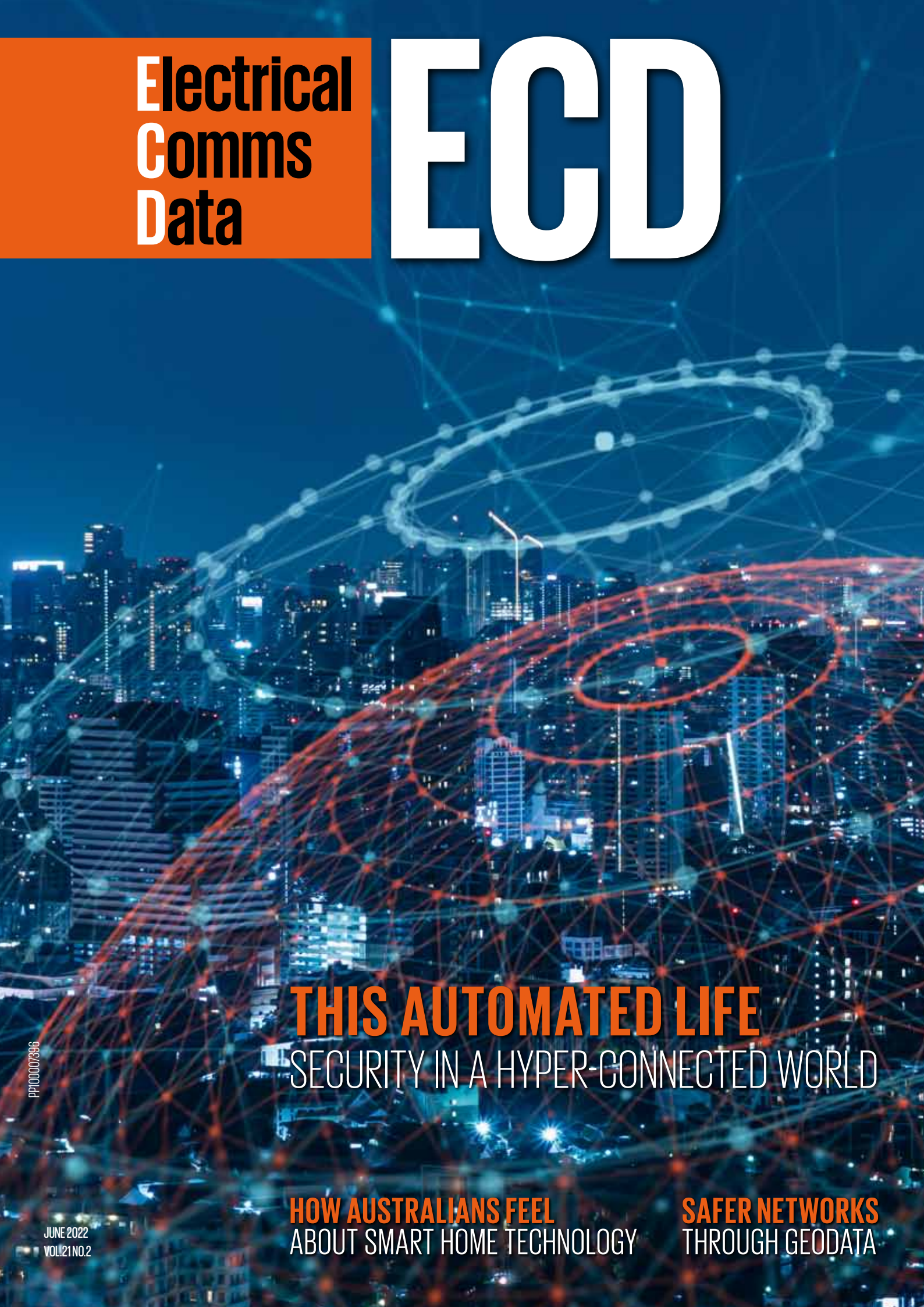

THIS AUTOMATED LIFE
SECURITY IN A HYPER-CONNECTED WORLD

HOW AUSTRALIANS FEEL
ABOUT SMART HOME TECHNOLOGY

SAFER NETWORKS
THROUGH GEODATA

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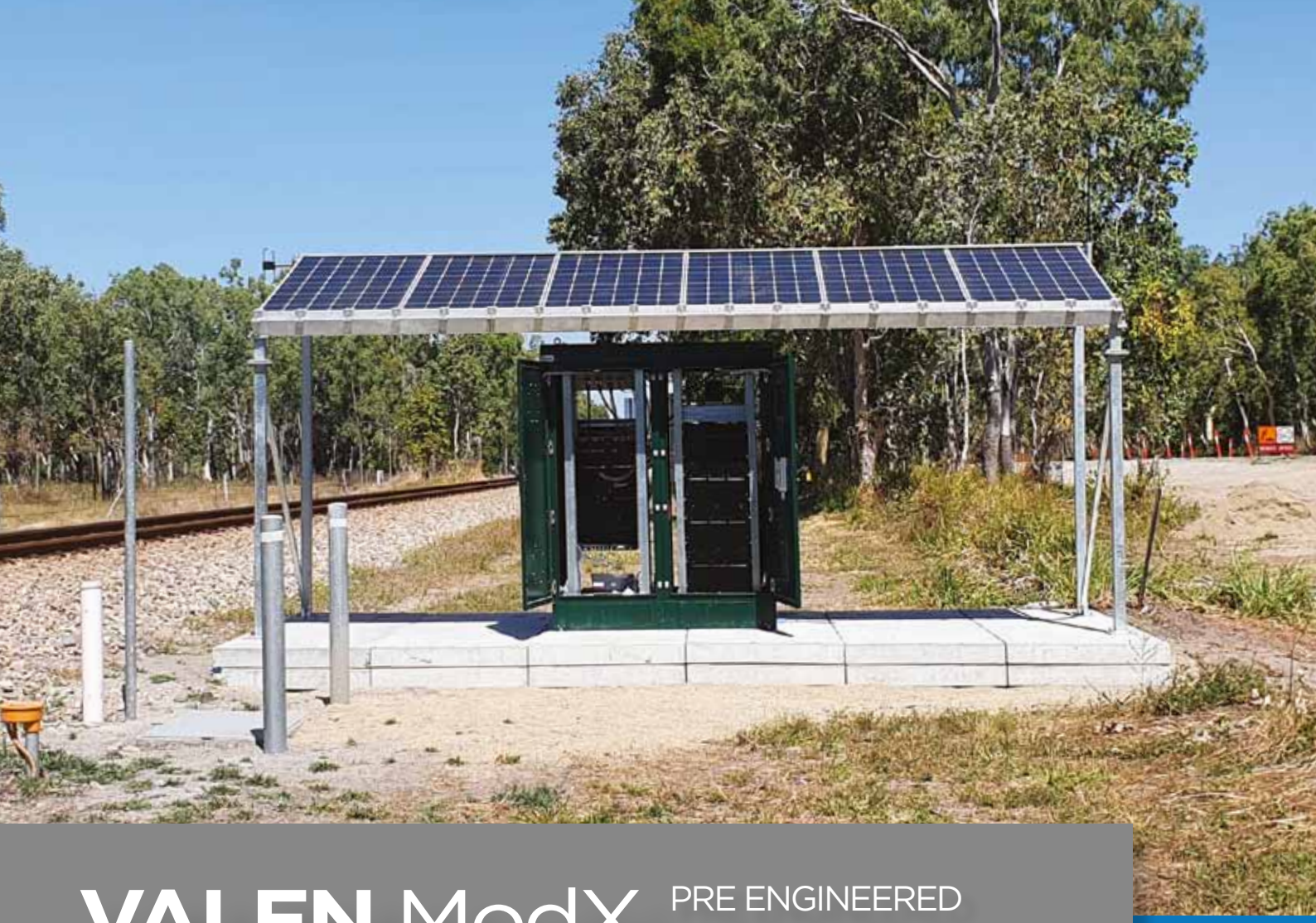

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FROM THE EDITOR

Does 'smarter' mean safer?

Welcome to the June issue of ***ECD***, which considers the enthusiastic adoption of automated systems — and introduces a note of caution. In our increasingly digitised and automated world, where smart cities have come to represent a futuristic ideal of seamless efficiency and productivity, there's a frightening possibility that vulnerabilities will be overlooked in the rush to embrace hyper-connected systems. In its most realised form, the smart city is a complex matrix that reaches into every aspect of civic life, from public transport to waste management — if something goes wrong, the fallout can be devastating, with every part of the network potentially affected.

In this issue's feature article, Jon McGettigan drills down into the inherent weaknesses of smart cities and suggests what should be done to avert disasters.

On a more domestic scale, smart home technology is becoming ever more popular (according to an ***ABC Science*** article from earlier this year, the 9000-strong Facebook group "Home Automation Australia" [HAA] tripled its members over six months last year) among a range of age groups. 'How Australians feel about smart home technology' explores some of the results of a recent survey of 1000 respondents, and finds that positive attitudes towards smart devices are often not matched by an awareness of the security risks.

In contrast, a couple of this issue's case studies show a more positive aspect of the security–automation nexus, demonstrating how automated systems have improved safety in a hospital and for a New Zealand electricity network.

Finally, as part of ***ECD***'s continuous coverage of the pressing topic of sustainability, Mark Deguara looks at data centres — a crucial part of our digitised, automated lives — and presents five steps for making them more environmentally viable.

Katerina Sakkas — Editor
ecd@wfmedia.com.au

WHY SMART CITIES OF THE FUTURE NEED SECURE INFRASTRUCTURE

Jon McGettigan, Regional Director, Australia, New Zealand, and the Pacific Islands, Fortinet

Smart cities have long been anticipated as a utopian vision of urban living. These hyper-connected hubs leverage IT, the Internet of Things (IoT), the Industrial Internet of Things (IIoT), and operational technology to create a smart environment that improves the quality of life for its citizens and visitors.

A smart city is a hive of ubiquitous, ongoing digital communication. The dynamic interaction of public and private organisations, people, devices and assets drives the smart technologies that in turn control water management, waste management, streetlights, air quality monitoring, on-demand public transport and other sensors that manage the social, physical, institutional and economic infrastructure of the city.

However, this massive amount of data exchange, integration between disparate devices and dynamically changing processes creates an unprecedented cyberthreat. If it's connected, it needs to be protected. As connected device numbers escalate to around 30.9 billion by 2025, this creates a growing digital attack surface.[1]

Each of these devices has its own vulnerabilities. And each device can pass those insecurities right through every layer of the city's smart infrastructure. A problem in one service area can quickly cascade, potentially leading to catastrophic failures and the disruption of law enforcement, residential services, hospitals and schools.

Without effective cybersecurity, smart cities cannot defend themselves against data breaches, hacking attacks and malicious actors. Many municipalities may be enthusiastically deploying smart city technology; however, there is often little strategy around its protection from cyberthreats.

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Inconsistent architecture, legacy systems and rushed deployments designed without cybersecurity at their core leave cities vulnerable, exposing easy targets for malicious attacks. Hasty patches and retrofits tether old systems to new, leaving weaknesses throughout the infrastructure.

Weaknesses can permeate all levels of the smart city infrastructure. Newer technologies may generate data in different formats. Older systems may have different, or weaker, security protocols and use different communications tools. If sensors, routers, switches, firewalls, endpoints or cloud services start to fail, hackers and attackers can pounce.

The lack of accepted standards governing IoT devices further exacerbates the problem. When cities experiment with new vendors or products, there's no guarantee that their technologies can talk to any of the existing infrastructure. The focus may be on the service they deliver rather than how they fit into the cybersecurity framework, potentially causing catastrophic data leaks.

Further to the issue of industry standards, bespoke, custom-built deployments also present a significant challenge. Older smart cities were unique builds or ad hoc, unconnected pilot initiatives. As technology has evolved, so have these initiatives, demanding an ongoing expansion plan, which is a potential minefield of backwards-compatible solutions that compromise interoperability and security.

Include the ever-changing requirements of individuals, economic drivers, pandemic implications, military threats and politics in the mix and it becomes clear that smart cities need to be agile, constantly responding to the world around them. However, they also need to focus on a secure core to protect their growing communities.

> A HOLISTIC APPROACH TO CYBERSECURITY, THE CONVERGENCE OF PHYSICAL AND DIGITAL INFRASTRUCTURE, AND THE INTERCONNECTEDNESS OF SYSTEMS AND DATA IS THE GOAL OF ANY SMART CITY.

With the right security technology and cybersecurity guidance, protecting smart cities is achievable. A holistic approach to cybersecurity, the convergence of physical and digital infrastructure, and the interconnectedness of systems and data is the goal of any smart city.

An integrated cyber risk framework should form the core of any smart city development. The goals of confidentiality, integrity, availability, safety and resiliency should be the foundation of any smart city planning.[2] It should inform how cyber risk may impact the entire city ecosystem across the regulatory, social, physical, institutional and economic infrastructure.

A robust and resilient cybersecurity core will let smart cities resist and predict cyber attacks. Instead of scrambling to shut down attacks, intelligent data collection and analysis across the entire infrastructure (both physical and digital) enables smart cities to leverage a more future-facing management system and then develop forensic capabilities to help trace a threat and contain it, preventing it from spreading beyond its host city.

As well as the technology itself, there is the vital element of human maintenance and management required to keep the infrastructure viable and effective. The cybersphere is constantly evolving. Threats are expanding at an even faster rate. An agile team that's efficiently administrating the infrastructure can proactively protect the city and its community.

Municipalities are deploying smart city technology and seeking ways to take advantage of the inherent benefits smart cities bring to their communities. However, deploying these technologies with little cybersecurity strategy may create fragmented and insecure systems.

With the right security technology and cybersecurity guidance, protecting residents from cyberthreats and attacks is genuinely possible. Smart cities can also be secure cities.

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HOW CLIMATE CHANGE WILL DISRUPT ELECTRICITY NETWORKS

A detailed new report from Energy Networks Australia (ENA) explores Australia's changing climate and how this is likely to affect future planning and investment by network businesses. The report, 'Electricity Networks: A guide to climate change and its likely effects', consolidates the latest scientific information on climate change and its impact on the electricity grid.

Taking into account the effects of extreme weather events on electricity network staff as well as the infrastructure they work on, the report draws on information published by CSIRO, the Bureau of Meteorology, the Intergovernmental Panel on Climate Change, universities, the Earth Systems and Climate Change Hub, and state government agencies.

ENA Chief Executive Officer Andrew Dillon said the changing environment presented new and unique challenges to Australia's electricity system.

"Australia has warmed by about 1.4˚C since 1910 — rainfall patterns are changing and extreme events, such as the recent floods in Queensland and New South Wales, are becoming more frequent and intense in many places," he said.

"These heatwaves, bushfires, storms and floods often seriously damage network infrastructure resulting in more and longer outages to customers and increased disaster recovery costs.

"Networks are acutely aware of the need to ensure the grid is resilient in the face of these challenges and customers want sensible investment to ensure they can manage through and recover from natural disaster events."

Dillon said the report would help inform further discussion about how networks could continue to best serve customers and communities in this changing environment.

"The document includes forecasts for each state and territory. Where available, there are projections for temperature increases, annual rainfall by area, sea level and extreme weather events," he said.

"For example, in Victoria, the number of days with very high fire danger rating in spring is increasing across the state. Under the projections outlined in the report, by 2050 there are likely to be 40% more very high fire danger days.

"In Queensland, tropical cyclones are projected to become less frequent, but the intensity is projected to increase leading to more flash flooding and damage to homes, businesses and infrastructure."

The report is designed to be an authoritative resource for the entire energy sector including executives, board members, operational staff, investors, market bodies, regulators and governments.

ELECTRICAL ERROR PLACES FAMILY AT RISK

A Nedlands family was placed at risk of serious injury after an electrical work errr caused the metal pipes at their home to become energised, with one person receiving an electric shock from a shower tap.

Following the November 2019 incident, Building and Energy prosecuted Canning Vale electrician Samuel Thomas Alliston (EW161275) for not adequately supervising the electrical work, which was carried out by an apprentice under his supervision. On 1 April 2022 at Perth Magistrates Court, Alliston was fined $5000 after pleading guilty to breaching WA's electrical licensing regulations.

The court was told that Alliston and the apprentice attended the Nedlands property to replace the main switchboard and install new lights and a fan. That evening, an occupant at the house received an electric shock from the shower tap, but luckily there were no serious injuries.

Building and Energy's investigation found that the main neutral conductor at the switchboard was left disconnected. Without a neutral connection, circuit protection mechanisms do not work and earthed metal objects are exposed to hazardous voltage rises that could cause lethal electric shocks or fires.

Magistrate Thomas Hall also ordered Alliston to pay costs of $1804 and emphasised the seriousness of any electrical offence, adding that "the buck stops" with the supervisor to ensure work is carried out correctly.

Western Australia's Director of Energy Safety, Saj Abdoolakhan, said the missing connection put lives at risk.

"It is essential that apprentices are properly supervised so the public can be confident in the safety and quality of the electrical work," Abdoolakhan said.

"This is another case where, had the mandatory checks and tests been undertaken, the electrician would have picked up and corrected the error."

SECURE YOUR DATA & EQUIPMENT

A data enclosure is your last line of defence, so it needs to be strong enough to stop unauthorised access.

The MFB range of Class B and Class C enclosures are purpose built frames fitted with key locks and boltwork approved by the Australian Government Security Construction and Equipment Committee (SCEC)

All enclosures are fitted with tamper evident cable entry systems, high impact clear polycarbonate panels on doors, secure venting systems and certified combination locks.

An alternative product, the MFB range of High Security enclosures provides a lower level of security and is not SCEC approved. Effectively construction methods mirror the Class B and Class C series, however the doors are fitted with a cheaper bilock keying system. Also additional flexibility with the design regarding cable entry encourages effective quick installation and high volume data cable installations.

With over 50 years in the business, and backed by the SCEC approval for manufacture, these Australian built 19"rack mount enclosures provide peace of mind in relation to the security your data needs.

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MELTING DOWNLIGHTS INVESTIGATED IN BONDI JUNCTION APARTMENTS

Lighting Council Australia has stated that in August 2021 it reported to New South Wales Fair Trading that light fittings in a Bondi Junction apartment building were melting and smouldering. NSW Fair Trading is the electrical safety regulator in New South Wales responsible for enforcing the compliance of electrical equipment.

More than seven months after the initial report, Lighting Council Australia said that NSW Fair Trading had made contact with the building manager, obtained melted product samples and started an investigation into the cause of the melting. According to the lighting body, this followed a number of messages from itself to NSW Fair Trading highlighting the potential danger posed by these light fittings and a Lighting Council Australia media release that was picked up by David Shoebridge, Member of the New South Wales Legislative Council.

Lighting Council Australia said Shoebridge highlighted its media release to NSW Fair Trading during a general committee meeting of the NSW Small Business Estimates Committee Meeting (Estimates is the post-budget parliamentary process) on Friday, 11 March.

NSW Fair Trading stated that they did not know anything about the current enquiry and would investigate the matter. The Lighting Council thanked Shoebridge for recognising the potential seriousness of this situation and for his prompt intervention. Following that Estimates Committee the Lighting Council understands that NSW Fair Trading contacted the Bondi Junction building manager and picked up the melted products on Monday, 14 March.

"Lighting Council Australia will continue to seek the cause of the product failures with the aim of improving the safety of this Bondi Junction residential apartment building and the Australian lighting market," the lighting body stated.

"Consumers should not be exposed to dangerous lighting equipment, and when potentially serious issues arise, suppliers should be asked to prove that their products are safe and compliant."

NEW FLEET OF ELECTRIC PRIME MOVERS UNVEILED

In what has been described as an Australian first, a new electric fleet of Class 8 Prime Movers was unveiled at the Janus Electric Showcase in White Bay, Sydney, on Tuesday, 5 April.

Rather than building electric trucks from scratch, Australian technology company Janus Electric has developed a solution that involves converting existing heavy vehicles so that they can be powered by the company's exchangeable batteries, which can charge 'anywhere, anytime' using renewable energy. "Our electric fleet is a mix of some of Australia's popular prime movers, including Kenworth, Freightliner, Mack, Volvo and Western Star vehicles, proving conversion is simple and easy to do across all makes and models," said Janus Electric General Manger Lex Forsyth.

"We don't need to purchase brand new electric vehicles to electrify Australia's freight network, our technology simply converts the heavy vehicles already out on Australian roads."

Forsyth believes these electric vehicles will transform Australia's freight network by significantly reducing emissions, operating costs and Australia's reliance on imported fuels — as well as underpinning greater investment into renewable energy generation. "Unveiling Australia's first electric freight fleet, made up of existing converted heavy vehicles, is a very important step forward for our road transport industry," he said.

Pointing out that all heavy vehicles require major engine rebuild at 1,000,000 km, Forsyth said this presented an ideal opportunity to convert to electric using the Janus Conversion Module (JCM).

"Electrifying our road network is no longer a pipedream for future Australia, but a real, tangible solution for today that we can act on now."

After undertaking operational trials since 2020, Janus Electric will also be expanding the use of its technology into more rugged terrain. "We have just announced a new partnership with Qube and OzMinerals that will see our technology put to the ultimate test, powering the world's largest electric truck to haul heavy mining loads through the harsh terrains of the Australian outback," Forsyth said.

"The 12-month trial will see our technology put through its paces under some of the harshest conditions in the world."

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HOW AUSTRALIANS FEEL ABOUT SMART HOME TECHNOLOGY

A new survey by Savvy canvassing 1000 Australians to see how they feel about using the Internet of Things (IoT) in the home has found that older Australians in particular are embracing smart home technology.

Almost half of Australians aged 55 to 65+ years (48%) now own one or more smart home devices and have spent between $1000 and $2500 on IoT technology. 41% currently have 5–10 connected devices.

This suggests that generally, members of this generation can be described as tech-savvy. They rely on IoT devices for safety and security, to manage and control their appliances remotely and to stay connected with family and friends. 75% of boomers and seniors have purchased smart security devices, while home entertainment products (53%) and smart hubs and assistants (47%) follow closely behind. (In comparison, the adoption of smart home technology is also prevalent from the ages of 18–24 and 35–44, with 58% relying on the IoT.)

However, the data also showed 33% of older Australians feel they are not tech-savvy enough to understand the risks of smart devices. These respondents choose not to use smart home devices because they do not believe they can protect themselves accordingly.

Overall, almost half (48%) of Australians are willing to spend more than $1500 on smart home devices, with 42% prepared to invest an extra $1500 to $5000 over the next 12 months.

44% of Australians across all age groups say they do not intend to invest in smart home devices because the products do not fit their needs. Privacy concerns are also a problem and deter many from buying devices for their homes. 21% of respondents are concerned smart devices are insecure.

Safety is the biggest motivator, followed by convenience and control

47% of respondents said increasing their safety and security is the main reason why they have chosen to invest in domestic smart technology.

Devices such as smart locks, cameras, video doorbells and security systems are the top purchases, while 44% are investing in IoT for the convenience and control of managing their devices remotely. The ability to monitor and control appliances, whitegoods and even gardening products with the push of a remote button or a voice command is popular across all age groups.

> WHILE THESE DEVICES ARE DESIGNED TO MAKE OUR LIVES EASIER, THEY ARE ALSO BECOMING THE NEW WEAPONS OF CHOICE FOR SCAMMERS, HACKERS AND PERPETRATORS OF DOMESTIC AND FAMILY VIOLENCE, SO SECURE DEVICES ARE PARAMOUNT.

When ‘smart’ isn’t necessarily safe

Despite safety and security being the top motivators, 13% of boomers and seniors have admitted their devices are not protected, taking no security measures or action to protect themselves from cyber attacks. 60% of seniors surveyed do use strong passwords, but only 8% use multiple measures such as two-step verification, router protection, VPN blockers, regularly updating devices and turning devices off when they are not in use.

Smart doorbells and security systems are among the most vulnerable household items for cyber attacks, yet 68% of respondents are still unsure about whether they are comfortable or uncomfortable with these risks. While these devices are designed to make our lives easier, they are also becoming the new weapons of choice for scammers, hackers and perpetrators of domestic and family violence, so secure devices are paramount. Lack of user security awareness is a common exposure of smart devices to vulnerabilities and cyber attacks.

Cost and privacy issues remain among the respondents' top concerns. 49% say they cannot afford the investment, while 82% worry about privacy and the collection of data and personal information. Surprisingly, only 8% are concerned about the mental health impact smart technology has on kids, teenagers and young adults.

As for whose responsibility it is to protect domestic IoT devices from hacks and privacy breaches, 89% of boomers and seniors say it's on everybody, including users and consumers, device manufacturers, device sellers, internet providers and the government, while 20% of all respondents feel it is only the manufacturers. 32% of respondents have chosen not to invest in smart home devices because they are concerned about security breaches and the possibility of being spied upon, harassed or having their personal information hijacked.

While the highest use is from boomers and seniors, younger generations are also on IoT devices

Australian children have been using smartphones more than ever in the last few years to play games, take photos, watch YouTube videos and keep in touch with their parents. But where do they sit with other connected devices in the home?

The survey shows 28% of IoT users are 5 to 10 years old. Toddlers are also accessing smart devices now, with 16% under the age of 5. This suggests smart devices are playing an increasingly prominent role in the lives of preschoolers, despite the risks and digital technology being a challenging space to navigate.

Sustainability and energy management are growing motivators for IoT users, with eco-smarts on the rise

While safety, security, convenience and control top the reasons Australians invest in smart devices, a growing number of users are also prioritising sustainability.

23% of respondents adopt smart home technology to track and reduce energy usage, save money on utility bills and create a more eco-friendly household. Products such as smart energy devices and climate appliances are popular investments. 37% of users buying smart devices for sustainability are 18 to 24 years old, while 23% are 35 to 44.

This could suggest a shift in consumer preferences. As more Australians accept responsibility for sustainable living, the need for energy-efficient homes is no longer a current trend during a smart home boom but a much larger movement towards long-term sustainability.

Motor control for high current contactors

Schneider Electric has launched its new generation of TeSys Motor Control for high current contactors.

The TeSys Giga will replace the soon-to-be-discontinued TeSys F product range, offering higher performance and durability, with the latest in smart technology innovations.

Operating from 115 A to 800 A for AC-3 applications and from 250 A to 1050 A for AC-1 applications, TeSys Giga has a range of features designed to maximise the machine's running time, including a modular design, compact footprint, lower consumption coils, self-diagnosis capability and highly reduced references.

TeSys Giga also offers electronic overload relays with full-scale protection and a set of accessories including improved auxiliary contacts.

Schneider Electric
www.se.com/au

Laptop

Created with the hybrid workplace in mind, the 14.0″ Portégé X40-K laptop is 17.9 mm wide and weighs under 1.46 kg. (Weight may vary depending on product configuration, vendor components, manufacturing variability, and options selected.) Though thin and light, it was engineered and tested to MIL-STD-810H standards for strength and durability. It has a thin bezel 14.0″ IPS or multi-touch display, premium backlit keyboard and large multi-touch ClickPad embedded into a comfortable aluminium palm rest.

With full-performance 28-watt 12th Gen Intel Core processor options, the Portégé X40-K benefits from enhanced efficiency afforded by Intel's new hybrid architecture. Configurable with either Core i3, Core i5 or i7 CPUs, up to 64 GB of memory and reinforced with speedy SSD storage, Wi-Fi 6E and Thunderbolt 4, the Portégé X40-K is suited to multitasking. Intel Iris Xe graphics add crisp video performance, support for up to four external 4K displays and enhanced security.

The laptop has a variety of ports, including full-size HDMI, Gigabit LAN, 3.5 mm audio and USB-A, as well as a microSD card slot. When not in use, Sleep & Charge technology keeps a USB port powered, allowing the laptop to charge a smartphone and other accessories.

The Portégé X40-K comes preconfigured with Windows 11 Pro and meets Microsoft's strict Secured-core PC requirements (vPro models). It is designed to address the security and manageability challenges posed by the accelerated shift towards flexible working patterns.

Dynabook's proprietary BIOS offers another security layer to mitigate BIOS level security threats, while integrated features like Trusted Platform Module (TPM) 2.0, enterprise grade encryption and optional Windows Hello fingerprint and face authentication provide more protection against data, device and identity threats.

Intel Active Management Technology (AMT) (vPro models), integrated into the new 12th Gen Intel Core processors, offers streamlined management of devices, even remotely. Dynabook's proprietary BIOS can also be upgraded and managed remotely to maintain high levels of security.

Dynabook ANZ Pty Ltd
https://anz.dynabook.com/

HOW HAZARDOUS AREA LIGHTING IMPROVES UNDERGROUND MINE SAFETY

Lighting is one of the most common causes of explosion ignition in high-risk mining environments. In addition, inadequate lighting and electrical light failures pose major safety risks within hazardous mines.

In 2020, the International Council on Mining and Metals (ICMM) reported fire and explosions as the third-highest cause of fatalities globally[1].

Ensuring that hazardous area lights meet the highest local and international safety standards and certifications is paramount to keeping workers safe, while also improving light quality and visibility, maximising productivity and reducing operating costs.

Exposing the dark side to inadequate lighting

Many underground coalmines continue to operate with inadequate lighting in hazardous underground areas like coal wash plants, reclaim tunnels and conveyor systems where flammable gases are present.

In many cases, coal wash plants and reclaim tunnels are positioned underneath coal stockpiles and are at risk of fire and explosion because of the potential build-up of methane gas and coal dust due to coal transportation.

Because reclaim tunnels serve as the main transfer point from coal stockpiles to other areas within the mine, appropriate lighting is paramount.

In addition to the possibility of explosion ignition, traditional lighting sources like fluorescent lighting pose serious health and safety risks. The inadequate distribution of lighting increases the likelihood of slip and trip hazards, and makes it more difficult to detect any damage to conveyor systems and other vital equipment, further compromising safety, visibility and productivity.

The rise of LED strip lighting

There has been a rising demand for linear lighting systems, like LED strip lights, that provide continuous illumination in often hard-to-reach places. In fact, explosion-proof LED strip lighting solutions are becoming a safer, more cost-efficient solution to alternative complex lighting infrastructures in hazardous areas.

In highly explosive or combustible environments, electrical failures in lights should result in either immediate isolation of the spark through encapsulated lighting, or non-sparking such as intrinsically safe lighting fixtures.

Industrial-grade LED strip lights work by isolating and containing sparks from escaping and igniting gases, dust, fibres and particles in hazardous atmospheres.

When selecting any new hazardous area lighting fixture, ensuring that the lights meet the highest local and international safety standards and certifications is paramount. Some important features to look out for include:

- IECEx and ATEX certified
- low voltage
- IP65 or higher
- robust and durable design to withstand extreme temperatures
- corrosion resistance
- impact and shock-resistant outer shell
- 80 + colour rendering index (CRI)

Explosion-proof LED strip lights in action

Last year, MineGlow introduced IECEX and ATEX certified explosive-proof LED strip lighting in Oceania approved for Gas Zone One and Two and Dust Zone Twenty-one and Twenty-Two.

The explosive-proof solution minimises risk by isolating and containing sparks within the strip to prevent explosions from escaping and potentially igniting the gases and particles in the atmosphere.

Fully encapsulated with silicone, the lighting system is resistant to dust, humidity, chemicals and extreme environmental temperatures without enabling the risk of an explosion.

MineGlow partners with mines across Australia, most recently working with a Queensland underground coalmine to improve visibility and safety of their reclaim tunnel.

The installation of the x-Glo Exm range enabled the mine to significantly improve the health, safety and wellbeing of site personnel working in the tunnel. The solution also improved inspection and maintenance time due to the increase in illumination throughout the reclaim and wash plant tunnel.

[1] International Council on Mining and Metals (ICMM) 2020 Safety Performance Report.

Mineglow
www.mineglow.com.au

Safety eyewear line

Bollé Safety, a leading manufacturer of safety glasses and goggles, has launched ProBlu, a line of protective eyewear made from advanced blue blocker lens technology, PrB 420, aimed at preventing vision damage from harmful blue light. The usage of digital devices with LED technologies has increased and with this usage comes increased exposure to blue light, which is emitted by LED screens at higher levels than naturally emitted by the sun. This has become a growing concern for health, with exposure to blue light linked to eye strain, long-term retina damage, as well as negative impacts on physical and mental wellbeing. To combat exposure to blue light and reduce the risk of these health concerns, the ProBlu line currently consists of 19 different pairs of protective glasses for different types of wearers.

This range was developed with advanced and embedded blue blocker lens technology, ProBlu 420 and ProBlu 445, using polycarbonate lenses to allow for the dispersed pigments to block blue light up to 445 nanometres (nm). Combined with the blue anti-reflective coating applied to the inside of the lens, the ProBlu 420 product range absorbs 100% of the harmful blue light up to 420 nm, making wearers' eyes feel more comfortable and less strained. As screen time is a part of everyone's daily routines, ProBlu by Bollé Safety offers products for both the wearer's professional and personal lives.

Designed for those in more industrial work environments, these glasses combine protection and performance, fully compliant with international safety standards to protect wearers' vision from blue light as well as other hazards in their work environments. Those at worksites including research laboratories, automotive plants and construction sites, as well as oil, gas, mining and power facilities, face blue light from a variety of sources, so these glasses are designed with advanced blue blocker lens technology to maintain high levels of productivity at work.

The range also features glasses designed for those who sit in front of screens all day. The ProBlu Screeners' glasses come in a variety of sophisticated styles, from retro and timeless to bold and modern, while still offering blue light protection and made with the same anti-glare and scratch-resistant innovations found on all Bollé Safety products. The Wellington and London models are also available as reading glasses ranging from +1 to +3.

The full range of ProBlu products is available at select worldwide retailers and online.

Bolle Safety AU Pty Ltd
www.bollesafety.com.au

Stainless steel enclosures

The new Kraus & Naimer enclosures added to the 6S Series of stainless steel enclosures provide rigorous protection for vital switchgear but with the same footprint as the plastic versions, combined with bottom threaded entries and four screw cover fixings with removable mounting feet.

Suitable for dairy and food & beverage industries, the enclosures can also be used in sewerage treatment plants, mining and marine.

The enclosures are Australian manufactured, constructed from 1.6 mm 316 stainless steel and are rated to IP66.

Kraus & Naimer can also meet users' unique application needs, such as EMC/RFI screened glands suitable for stainless steel, mild steel or plastic enclosures.

Kraus & Naimer Pty Ltd
www.krausnaimer.com.au

AC/DC power supplies

Cincon has released the CFM06S series of 6 W AC/DC power supplies, available in open-frame or enclosed versions (CFM06Sxxx-E). The converters have short-circuit protection, overvoltage protection and I/O isolation of 3000 VAC.

The power supplies can be used for a variety of low-power applications. Operation over a wide temperature range (from -40 to 80°C) and in high humidity conditions (<93% RH) makes them universal and suitable for difficult environmental conditions. The series is also distinguished by its low no-load current consumption, typically less than 75 mW.

The products meet EN 55032 Class B (low EMI), CISPR/FCC and IEC/EN/UL 62368-1 (safety requirements for audio/video, information and communication technology equipment), and are compliant with IEC/EN60335-1 (safety of household and similar electrical appliances).

Transfer Multisort Elektronik
www.tme.eu

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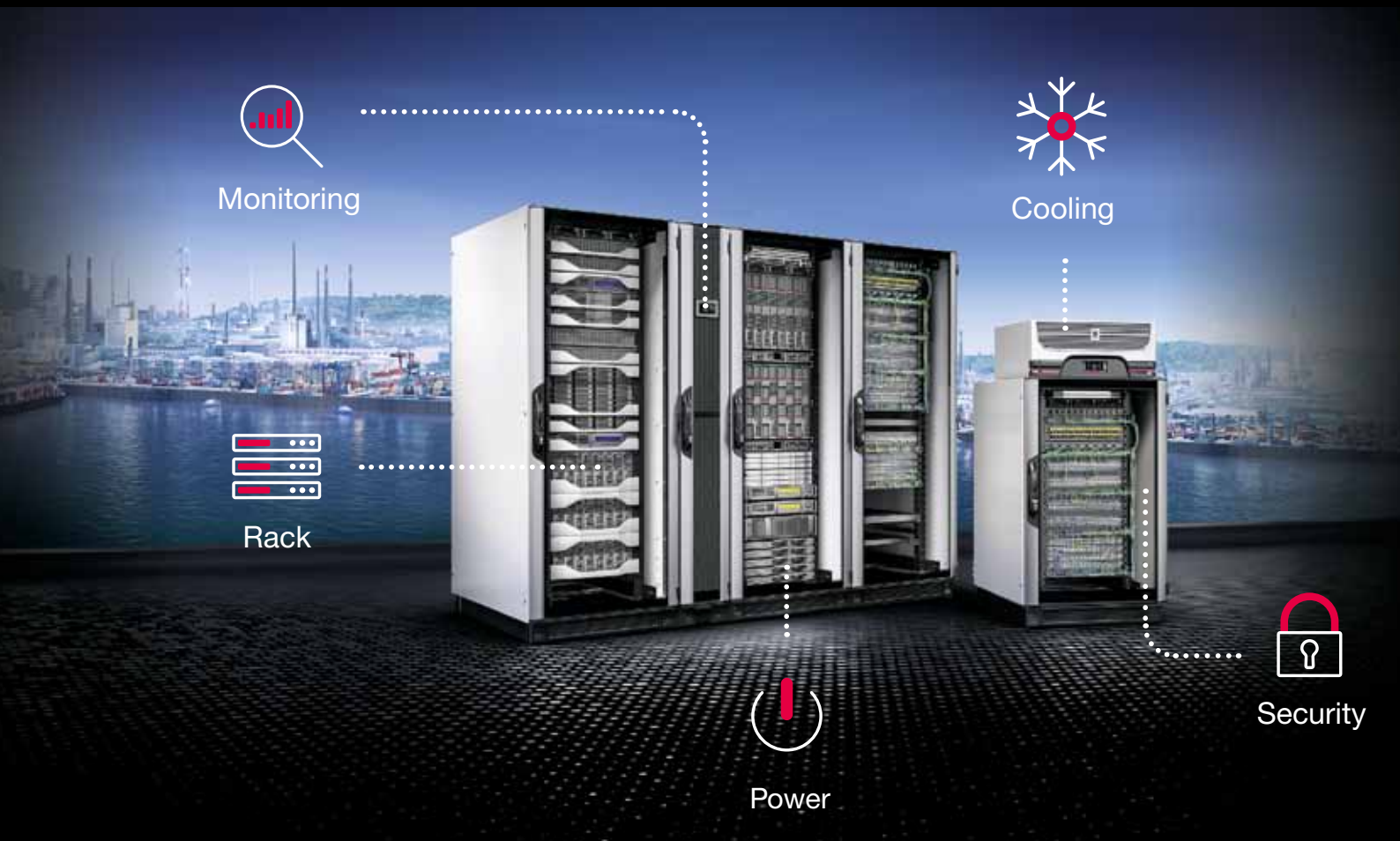

ENCLOSURES | POWER DISTRIBUTION | CLIMATE CONTROL | IT INFRASTRUCTURE | SOFTWARE & SERVICES

FRIEDHELM LOH GROUP

Touch switches

Sonoff's TX series switches are designed for integration into modern home and office settings. The wireless switches are not only convenient and modern, they are also suitable for people with disabilities or limited mobility.

The switches are installed in junction boxes and, depending on the model, have one, two or three backlit buttons that can be activated by touch, through a dedicated app on mobile devices or by voice, by coupling the switch with Amazon Alexa or Google Assistant. The switches are easy to mount and can be added to new systems or retrofitted into existing ones.

To take full advantage of the functionality of the switches, they need to be connected to a local computer network. This can be done both via a wireless Wi-Fi network or using a LAN network, especially in case of wireless network problems (eg, due to location, thick reinforced concrete walls or too many devices on Wi-Fi).

The touch switches are available in two different size formats (either 86 x 86 x 35 mm or 120 x 74 x 38 mm) and run off a 100 to 240 VAC supply. White and black enclosure versions are available, to fit in with the aesthetics of the surrounding environment.

Transfer Multisort Elektronik

www.tme.eu

In-vehicle computer

Sintrones' VBOX-3131 is an ultra-compact, fanless in-vehicle computer with 5G connectivity. It utilises Intel ATOM Braswell N3060 Dual-Core CPU up to 2.48 GHz. Measuring 150 x 135 x 55.3 mm, the computer is designed to fit into restricted spaces. The system can select 5G, LTE, GPS and Wifi/BT by M.2 modules. In addition, it has a built-in dual-independent DVI-D, audio line out and microphone in, which makes it a good solution for fleet management, in-vehicle digital signage and mobile DVR. VBOX-3131 facilitates smart vehicle power ignition and wireless remote control in a variety of vehicles.

VBOX-3131 can effectively support vehicles such as trucks, buses, taxis and forklifts in extreme weather and operating conditions.

Backplane Systems Technology Pty Ltd

www.backplane.com.au

Power connector

For harsh environmental conditions, Treotham offers the ILME CX 8/0, a robust power connector providing quality performance in a smart design. The safe crimp termination makes CX 8/0 highly resistant.

With axial screw technology, this connector delivers gas tightness providing strong corrosion resistance; high resistance to mechanical stresses such as vibration, shock and strain on wire strands; and fast connection time.

The new 8-pole also borrows the main characteristics of its combined connectors product family: a quicker fitting and removal of crimped contacts via the proprietary red locking keys, patented by ILME, to firmly fasten the contact holder.

From a design point of view, CXF/M 8/0 allow an electrical performance up to 100 A, are suitable for applications up to 690 V and employ crimp contacts, CG series, for conductors up to 35 mm^2/2 AWG. They are fully interchangeable and intermateable with competitor products.

Treotham Automation Pty Ltd

www.treotham.com.au

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AUSTRALIA NEEDS DISASTER-PROOF SOLAR

The flooding of thousands of homes on the east coast has highlighted the need for Australia to mandate rapid shutdown technology on solar photovoltaic (PV) systems, industry group Safer Solar has warned. With solar panels installed on one in four Australian homes, many systems lack a quick and easy way to shut down solar panels in the event of a fault or emergency, creating a serious safety threat for homeowners, first responders and tradespeople. Solar panels that were not shut off before the floods may begin generating electricity when the sun shines, potentially without the safety systems designed to protect people from uncontrolled high-voltage electrical currents.

More than 90% of rooftop solar PV systems installed in Australia include high voltage direct current (DC) wiring that is live whenever the sun is shining. This 600- to 1000-volt current, which cannot be shut off during daylight, can jump a 100 mm gap between a system component and any earthed conductive material. Any break in wiring insulation or weather sealing of components can allow an electrical arc to form. Approaching 1000˚C, this arc is hot enough to ignite fires — and does so more than twice every day in Australia. It can also deliver a lethal electric shock. This risk was highlighted when a family in far north NSW tied tent ropes to solar panels on their roof while awaiting rescue from the floods. If the sun had come out while they were on the roof, they faced the risk of a damaged solar panel or inverter causing a live electrical current to run through the roof.

An Australian solar industry-supported initiative committed to improving solar power system safety, Safer Solar highlights the need for solar energy management systems that can:

- quickly and easily shut down solar PV systems in the event of fire, flood or other disasters;
- isolate individual solar panels that fail to meet safety standards through remote management;
- monitor solar panels remotely for problems to enable quicker post-flood recovery.

Safer Solar member Enphase Energy Australia estimates that approximately 700,000 houses equipped with solar panels were in areas hit by the east coast flooding — nearly half the total number of solar-equipped homes in NSW and Queensland. Enphase Energy General Manager ANZ Wilf Johnston said Australia lagged behind many other countries in mandating safer solar technologies such as rapid shutdown of solar systems. “Rapid shutdown is already mandated in the US so solar panels can be made to stop producing energy in the event of a disaster like fire, flood or tornado,” he said.

> WE'VE HAD SIGNIFICANT DISASTERS DURING THE PAST TWO YEARS INCLUDING HAILSTORMS, BUSHFIRES AND FLOODING. WHEN THESE CATASTROPHES OCCUR, PEOPLE NEED TO DECIDE ON PRIORITIES, WHICH IS WHERE REMOTE MONITORING PAYS OFF. – JEFF ROUTLEDGE

In the US, National Electrical Code (NEC) 2017 was implemented to protect firefighters and consumers who need to interact with a PV system by providing a simple, robust and reliable solution to shut down the voltage at module level to 1 V per module in the event of a problem. NEC 2017 mandates rapid shutdown for millions of solar PV panels and all solar inverters.

"Even developing countries such as Thailand and the Philippines now mandate rapid shutdown systems," Johnston added. "The risk in Australia is increased by the fact that many solar systems are now 10 or more years old, adding a decade's wear and tear to outdated technology. Australia needs to mandate that replacements for these old systems and all new systems meet the highest safety standards — which includes rapid shutdown."

Master Electricians Australia and Tigo Energy are also Safer Solar stakeholders. Master Electricians CEO Malcolm Richards supported the call for better safety measures for rooftop solar, emphasising that without such action, tragedy was inevitable. "Household rooftop solar panels are not new in Australia, but thankfully we have had only a handful of major floods since the solar boom began around 15 years ago," he said.

"What that means is that we've been lucky so far in avoiding any serious injury or death from live solar panels during an emergency. However, without urgent action, it can only be a matter of time until we do face a tragedy. In any flood, Master Electricians always steps up to warn homeowners of the dangers of climbing onto a roof, even if the power has been switched off. In the short term, it would be helpful for governments to join that effort with an information campaign ahead of flood season.

"In the longer term, we need to address this through legislation and upgraded standards and we need our state governments and regulators to step up on this issue."

Tigo Energy Senior APAC Director Jeff Routledge said rapid shutdown was just one of the benefits of the module-level power electronics (MLPE) that distinguishes safer solar technology. "MLPE allows panel-level remote monitoring and management, which means quicker and safer restoration of solar energy to homes after disaster strikes," he said.

"We've had significant disasters during the past two years including hailstorms, bushfires and flooding. When these catastrophes occur, people need to decide on priorities, which is where remote monitoring pays off. It allows you to review the solar PV systems, audit their status and safety, and prioritise what to do next — without having to send an electrician out onsite."

To learn more about Safer Solar, visit www.safersolar.com.au.

Universal PCI board

ICP Australia has released ICP DAS's PISO-CAN400U-T, which is a 4-Port CAN Universal PCI board with 5-pin Screw Terminal Connectors. The CAN (controller area network) is a serial communication protocol, and efficiently supports distributed real-time control with a very high level of security. It is a special suite for networking 'intelligent' devices as well as sensors and actuators within a system or sub-system. In CAN networks, there is no addressing of subscribers or stations in the conventional sense, but instead, prioritised messages are transmitted.

As a standalone CAN controller, PISO-CAN400U-T can represent an economic solution for an active CAN board. It has two or four independent CANbus communication ports with a 5-pin screw terminal connector and can cover a wide range of CAN applications. PISO-CAN400U-T also uses the new CAN controller Phillips SJA1000T and transceiver 82C250/251, which provides bus arbitration, error detection with auto-correction and re-transmission function. It can be installed in a 5 V PCI slot and is configured for plug and play.

Due to its multifaceted nature, PISO-CAN400U-T is suitable for multiple applications, such as logistics, manufacturing and energy production.

ICP Electronics Australia Pty Ltd
www.icp-australia.com.au

Protective eyewear

The 3M Solus Brand is a family of protective eyewear that offers another option for comfortable and stylish eye protection with a variety of features and customisation options. With a range of lens and frame colours, along with a stylish fit and lower-profile frame, Solus Brand provides workers with eye protection that's reliable and fashionable.

The Solus Brand features polycarbonate lenses, an elastic strap, padded temples and a soft nose bridge for added comfort. The Solus Brand meets the requirements of AS/NZS 1337.1:2010 and features Scotchgard Protector Anti-Fog Coating (only available in the Solus 1000 Series). The anti-fog coating is designed to resist fogging for longer than traditional anti-fog coatings through up to 25 washings.

The Scotchgard anti-fog coating helps provide scratch resistance in tough work environments and is designed for working in challenging situations, such as hot and humid conditions, indoor/outdoor work, physically demanding tasks and climate-controlled areas.

The 3M eye protection range meets both the Impact Rated Protector and Anti-Fog Performance (X) requirements of the ANSI-ISEA Z87.1-2020 to AS/NZS 1337.1:2010 Standard.

3M Safety & Industrial Business Group
www.3M.com/au

Handheld OTDR

The Ripley Tools ODM OTDR 800 is a handheld, touchscreen optical time-domain reflectometer, providing test technicians and contractors with an all-in-one solution for testing optical reflection and loss in fibre networks.

The OTDR is lightweight, portable and has a protective rubberised shell. The compact yet rugged design makes it suitable for both linesmen working underground or in bucket trucks, or data centre technicians with limited space.

The OTDR allows a technician to quickly select from a wide variety of wavelength configurations and easily view the test results in either a schematic view, trace view or event table with pass/fail analysis for each reflective event. Individual events can be inspected manually using the event selection feature, or automatically with the device's built-in smart pass/fail analysis function. After testing, results are easily transferred to an Android smartphone or tablet with Bluetooth, or a Windows device by USB with the included ODM OpTrace software.

Ripley Tools
www.ripley-tools.com

Promoting IBC and Public Safety

In a world where cars can drive themselves and identities can be verified with a retina scan, it seems almost inconceivable that people are still struggling to use their mobile phones indoors — especially considering the expanding global market for smart buildings, which is expected to reach more than $37 billion by 2023 according to the Globe Newswire. Ironically, new buildings continue to be plagued by poor signal propagation, because of the very same features that brand them eco-friendly and attract potential occupants: low-emissivity (Low-E) glass, galvanised steel, metal roofs, and concrete walls are but a few common culprits. In the case of older properties whose designs simply did not take mobile coverage into consideration, building materials such as stone, concrete, and brick are notorious signal blockers, especially in densely populated urban areas.

We depend on our Public Safety Agencies to protect the Australian community, and they do it every day. Around the country over 550,000 women and men work selflessly to uphold and protect our Australian way of life. Communication is critical to that work. Smart, strong, and fast systems enable better decisions that save lives. Over 6.3 million Triple Zero (000) calls are made every year in Australia. Each one of those calls triggers a complex systematic response underpinned by mission-critical grade radio communications. Put simply, these communications systems have been built not to fail.

If someone is in distress and unable to place an outgoing call, first responders will not be aware there is an emergency that requires their response. For this reason, the Safer Buildings Coalition defines three pillars of in-building safety communications:

- Mobile 000 calls must get out with location accuracy.
- Mobile Mass Notifications must get in.
- First Responder communications must work.

"If someone is attacked in the basement carpark of a building and can't call 000 because there was no mobile phone signal, the body corporate managing the building could be sued."

If a building cannot deliver these basic characteristics, the environment puts the occupants and the property itself at risk.

Anyone who has ever tried to place a call from an elevator is not surprised that indoor coverage can be much worse than outdoor coverage. And the deeper into a building you go, the worse the signal typically gets. Penetrating walls is difficult for a mobile signal, though some of the RF spectrum blocks that the Australian mobile network operators have licensed are better for this task than others. Low band (longer wavelengths) spectrum tends to be much better at penetrating concrete and brick than high band (shorter wavelength) spectrum, such as 5G.

5G has been hailed as a saviour for those 'screenagers' amongst us, but the benefits of faster data may well be offset by an increase in problems caused by poor coverage due to the reduced ability of this bandwidth to penetrate. It is very much a wait and see approach to determine how much of a coverage problem 5G will actually cause.

The Federal Government is making a significant investment to improve wireless network coverage in rural areas; the Government has committed $380 million to the Mobile Black Spot Program to invest in telecommunications infrastructure to improve mobile coverage and competition across Australia.

However, poor wireless coverage can be experienced in big cities as well. The networks were originally designed to work well in a "mobile" environment — namely outdoors while in moving vehicles or walking. As indoor usage has grown, the networks have densified, and greater efforts have been made to provide a signal strong enough to penetrate buildings. Providing high-quality indoor coverage is much more difficult.

Understanding which buildings fall short of providing adequate service can assist local governments in working with building owners and mobile operators to make needed improvements.

In Australia, there is no building code, regulation or legislation that mandates In-Building Coverage (IBC) to support operational communications.

For building owners, the benefits of providing reliable high-speed wireless coverage are clear: apart from the OH&S liability associated with poor IBC, there is increased tenant retention and recruitment rates, increased workforce productivity, and more attractive property for visitors. Many building owners and operators believe having a strong indoor wireless network increases the value of their buildings by as much as 28%, according to CommScope.

For more information on In-Building Coverage solutions talk to our team of experts today on 1300 769 378, email sales@powertec.com.au or visit www.powertec.com.au to view the full range of products.

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KEEPING COOL, SUSTAINABLY

A recent study led by the University of Sydney has found that when indoor electric fans are used more often, this allows people to decrease their air conditioner use without changing how hot they feel — demonstrating a simple but effective way to reduce future energy use and greenhouse gas emissions.

The study found that, in terms of reducing greenhouse emissions, the total benefit of using fans to reduce overall air conditioner use surpassed even the switch from incandescent light bulbs to LEDs. According to the study's modelling, slightly increasing indoor air movement by using indoor fans can reduce electricity consumption — and the associated cost of cooling indoor spaces with air conditioners throughout a typical Australian year — by approximately 70%.

The study was conducted by a team of experts from the University of Sydney alongside colleagues from Monash University, the University of Newcastle and Radboud University Medical Center, based in the Netherlands. Their findings have been published in *The Lancet Planetary Health*.

The team's work shows how making the switch to widespread indoor fan use can potentially reduce energy demand and greenhouse gas emissions. The key lies in the fundamental way electric fans operate to cool the human body compared to air conditioners. Electric fans generate higher air speeds across the skin surface to achieve a higher heat loss despite warmer temperatures, while air conditioners by themselves lower temperatures with little air movement.

"Through their sole purpose of lowering air temperatures, air conditioners feed a cycle of high electricity consumption — often delivered by fossil fuel power stations that in turn contribute to further increases in emissions," said co-senior author Professor Ollie Jay, Director of the Heat and Health Research Incubator in the Faculty of Medicine and Health.

"The latest IPCC Sixth Assessment Report on Mitigation of Climate Change emphasises the need for adoption of low-emission lifestyles, including cooling choices for thermal comfort."

"Our study confirms that low-cost solutions such as fans have the potential to contribute emission reductions for meeting the goals of the Paris Agreement," said lead author Dr Arunima Malik, Senior Lecturer in Sustainability at the School of Physics and Business School.

The researchers analysed energy use and associated greenhouse gas emissions by modelling five scenarios with different combinations of fan and air conditioner use. After logging data on the impact of the fans on human comfort levels, the number of hours above the thermal comfort limit were calculated to determine air conditioner usage, and associated energy use and greenhouse gas emissions.

"To carry out this calculation we needed to process hourly temperature data for an entire year, for the entire continent on a 150,000-cell raster grid. We were able to do this using supercomputers," said co-senior author Professor Manfred Lenzen of the School of Physics.

They found that operating fans with air speeds of 1.2 m/s with occasional air conditioner use, compared with air conditioners alone, resulted in a 76% reduction in energy use (from 5592 to 1344 GWh) and associated greenhouse gas emissions (5091 to 1208 kilotonnes).

"We know that curbing greenhouse gas emissions is the only way we will limit future global warming," Jay said.

"By increasing indoor air movement with fans, you can feel the same at a higher temperature as you will do at a lower temperature using an air-conditioning unit. This is a really easy thing that most people can do now to help reduce the prodigious emissions associated with cooling homes and indoor spaces in Australia."

Software-defined router

iEi's PUZZLE-M902 is a software-defined router pre-installed with OpenWrt featuring high speed and high flexibility to improve network performance.

The PUZZLE-M902 is powered by a Marvell CN9130 quad-core SoC. The high-performance processor offers a complete function and acceleration for networking and security applications. This series is integrated with 2.5GbE ports and its function can also be expanded by open source applications supported in the OpenWrt community. It is suitable for a wide range of applications, such as SOHO and SMB networking infrastructure.

Through OpenWrt, the PUZZLE-M902 provides a user-friendly web interface, a clear dashboard and port indicators for the handling of daily network management tasks. Users can manage all connected wires through OpenWrt OS in real time as well as configuring firewall, VPN, security and advanced network functions.

It has three 10GbE RJ-45 Ports (one via Marvell CN9130; two via Marvell 88F8215); 4 GB eMMC; and LED indicators for status/power and WAN/LAN interface.

ICP Electronics Australia Pty Ltd
www.icp-australia.com.au

Ethernet switches

With a high port density on a single, compact device supporting multiple gigabit speeds, GREYHOUND 105/106 ethernet switches deliver a cost-effective, scalable way for businesses to build networks for the IIoT.

Combining hardened industrial hardware with best-in-class HiOS software, these switches deliver a combination of security, diagnostic and redundancy measures.

Multiple configuration options are available for feature and price flexibility, and the high port count offers scalability for future bandwidth needs.

Belden Australia Pty Ltd
www.belden.com

Arc flash face shield

The ArcSafe AmpShield Arc Flash Face Shield from Elliotts Australia is designed to provide arc flash protection. Traditionally, flash face shields are tinted green to absorb the infrared light generated in the event of an arc flash. The higher the PPE CAT protection level required, the darker this green tint needs to be.

The ArcSafe AmpShield offers users a better alternative to traditional green face shields with its transparent grey colour that allows for full colour recognition and improved visibility. It also closely follows the Lambda curve of the human eye, allowing for scientifically proven optical properties. The face shield offers wearers an ergonomic, low-profile transparent chin protector, increasing wearers' field of view and providing additional arc flash protection. It also includes a cap bracket with a slotted adaptor to fit selected hard hats. The adjustable slotted adaptor allows workers to comfortably adjust the position of the face shield when not in use or exposed to risk.

The ArcSafe AmpShield meets the Short Circuit ARC Class 2 rating to GS-ET-29:2001-5 and 14 cal/cm^2 rating to ASTM F2178 for use in NFPA 70E-2015 for PPE Category 2 protection level. It is also certificated to the EN 166 certification and ANSI-ISEA Z87.1-2017.

Elliott Australia Pty Ltd

www.elliotts.net

Terminal box

Space, time-saving assembly and permanent durable protection in harsh environmental conditions are increasingly important key arguments for connectors. These points become especially challenging in the railway sector, offshore applications or other environments, where the wiring of complex components requires a balance between reliability and performance.

To meet these needs, the ILME IP68 MGK 2AP25 terminal box with cover has been designed to host and simplify the wiring of two 21.21 inserts in a single housing.

The enclosure offers vibration- and shock-proof connection of the CGK-MGK ILME hoods via the usual IP68 screw locking system and grounding of housing and cover using the specifically made PE terminal points inside the box. The M25 cable entry is particularly suitable to receive cable glands for conduits and hybrid cables, completing the features of an enclosure designed to be versatile and reliable.

Treotham Automation Pty Ltd

www.treotham.com.au

Work boot

Blundstone has released the #243 'crew boot'. Made in Blundstone's signature water-resistant wheat nubuck upper, the #243 is a 135 mm-high safety boot with a padded collar and tongue as well as Blundstone's SPS Max comfort system, making it suitable for those on their feet all day.

Blundstone #243 features include a wheat nubuck upper in a new low-cut design, water-resistant upper, zip sides for convenience and breathable, moisture-wicking lining.

The TPU outsole is resistant to 140°C and slip, oil, acid and organic fat resistant. It is electrical hazard resistant with a steel toe cap, tested to resist a 200-joule impact.

The #243 is available in sizes 5–13 (half sizes 7.5–10.5).

Blundstone boots are available online and in stores via select retailers throughout Australia, and are backed by a 30-day comfort and six-month manufacturing guarantee.

Blundstone Australia Pty Ltd

www.blundstone.com.au

Blue electric Volvo bus, Sweden. ©stock.adobe.com/au/Trygve.

ALL-ELECTRIC BUS FLEETS MIGHT MEAN BIG UPSWING IN HEALTH

In news that has positive implications for public health — especially as more cities around the world make the switch to electric public transport fleets — a recent study has found that the health of residents living alongside a bus route in Gothenburg, Sweden, was considerably improved following replacement of hybrid buses with those fully powered by electricity.

In autumn of 2019, all-electric buses were introduced on bus route 60 in Gothenburg. The implementation was linked to the ElectriCity project, which involves participants from industry, research and public agencies working towards sustainable travel in an urban setting.

In places, the roads along the bus route in question are highly uneven. Noise levels from the preceding system of bus transportation had been perceived as disturbing, especially on the uphill stretches. Previous noise-level measurements had indicated that disturbance from low-frequency noise in indoor environments was present in the residential area.

How much the change to electric bus transportation would affect the noise levels was not clear, and the same applied to how people's health would be influenced. The low-frequency noise was particularly significant, since it has a high disturbance potential and is less attenuated by facades or noise barriers than other types of noise.

Low-frequency noise hard to block

"We can be disturbed by different noises, but the issue with low-frequency noise is that it's attenuated less well by facades or windows and therefore intrudes into people's homes more easily. Even small increases in its level are perceived as very noticeable," said Kerstin Persson Waye, Professor of Environmental Medicine at Sahlgrenska Academy, University of Gothenburg, who heads the Sound Environment and Health group that conducted the research.

The study involved questionnaire surveys of randomly selected residents in two phases, before and after the switch to electric buses. Half of the residents lived in homes that lined the bus route in two city districts: Masthugget and Lunden. The other half, who lived some distance away, made up the reference group.

In parallel, noise measurements were performed in several homes — including indoors, which is not otherwise standard procedure. These measurements required special rigging with 10–12 microphones in each dwelling unit to provide correct and representative data of the low-frequency noise.

The changes that took place between phases one and two were clear and statistically significant. They applied to changes of the sound levels especially in the low frequencies; what the residents themselves noticed; and their reported noise annoyance. For example, the proportion of respondents who noticed noise from buses fell from 75% to 39%, and the proportion who were noise-annoyed to a very high degree decreased from 26% to 5%.

Distinct improvement in health

There was also a clear reduction of perceived health effects. The proportion who felt exhausted once or twice a week declined from 49% to 39% — that is, down to the same proportion as in the reference group. The proportion who were in a low mood decreased from 22% to 17%, and considerably fewer also stated that they were very sleepy in the daytime.

"So, there was an improvement: people felt significantly better. Although we can't say with certainty that the results reflect the whole population and how lasting the positive health changes are, we think they may be generalisable in residential settings where bus transportation makes up a large share of the exposure. Given, too, that other forms of transportation in the urban environment are getting more silent, this could influence public health," Persson Waye concluded.

Respondents in the study numbered 1326 in Phase 1, June–September 2019 (response rate: 34%) and 1191 in Phase 2 the following year (response rate: 36%). The response rate was as expected.

To investigate whether those who did not answer differed from the respondents, a follow-up study was conducted with a simplified questionnaire in the group who did not answer. No major differences in perceptions of the noise situation were found, but the level of education and the proportion who owned their home were lower in the group who had chosen not to participate in the large survey.

CASE STUDY

Hospital avoids power cuts through automation

The likelihood of power failures in Europe is growing dramatically due to stretched supply networks, growing customer demand and a greater reliance on variable sources of energy. Power shortages are inconvenient for any business, but especially hospitals. That's why Erasmus University Medical Centre in Rotterdam, Netherlands, turned to Ovarro, a control technology specialist, to provide an automated backup energy management and SCADA system to protect it from power outages.

For Erasmus University Medical Centre, any power outage can leave essential parts of the hospital completely in the dark, leaving everything from automatic doors to life-support machines without power. The risk would only grow as renewable energy becomes more common, with fluctuating supply that increases the likelihood of power outages. The need for an improved energy management and backup power system was clear.

The first challenge was the size of the hospital itself. Erasmus University Medical Centre is the largest of its kind in Europe, which makes it impossible to keep the entire hospital running on backup power. A more focused solution was needed that could prioritise critical systems, depending on the amount of electricity available at any given time, and switch these critical applications to the backup power as soon as an outage occurred.

The switch would have to be made without time-consuming manual switching or lengthy decision-making. The hospital also wanted a dynamic system rather than a hardwired one, so system priorities could be added or changed over time. In short, the hospital needed to automate its backup power grid.

More control

To achieve this, Erasmus University Medical Centre turned to Datawatt, now part of Ovarro, which designed a complete energy management and supervisory control and data acquisition (SCADA) system.

The system is unique in the level of control it gives for where the backup power is directed. Because the energy management system has fine-tuned switching capabilities, very specific areas or assets in the hospital can be swiftly provided with power — the emergency lights, for example.

As well as automating the distribution and switching of power in emergency or outage situations, the system also collects data. This information helps monitor power consumption and the switching of electricity, to maximise the efficiency of the system and address issues before backup generators are needed.

Modular design

The energy management system and SCADA supplied by Ovarro and Datawatt uses standard hardware connected through a fast and reliable fibre network. This, combined with the system's modular design, makes it possible to connect more devices into the system as the hospital expands. With Ovarro's support, the system has grown to include over 200 remote telemetry units (RTUs) around the hospital.

The system's RTUs have also been gradually upgraded. The latest version is the DSG RTU from Ovarro, a cost-effective and state-of-the-art RTU for integrated network applications. The DSG RTU offers maximum security and even more flexibility than its predecessors. It combines with 600 remote input/output (I/O) units placed in various cabinets for complete control over where power can be directed. Ovarro has combined the DSG RTUs with other components to create a full-cabinet system that can be installed easily around the hospital.

As pressure mounts on the European electricity grid, power cuts may become more common. Fortunately, this needn't be a major concern for Erasmus University Medical Centre. With its automated energy management and SCADA system supplied by Ovarro, backup power can now be supplied almost immediately to where it needs to go, keeping the hospital running safely.

Ovarro
ovarro.com/en/australia--new-zealand/home/

Enclosures

Manufactured in Australia, the SoHo range of MFB S210 enclosures provides a good solution for removing desk clutter. These simple enclosures offer a vertical storage solution for equipment that could otherwise take up unnecessary desk space. A host of options is available, including castors that provide the flexibility to move around, and key-lockable doors with acrylic or full metal panels. There are also the facilities to wall mount if floor space is required.

SoHo S210s are manufactured from 1.0 m galvanneal steel, with two internal 19″ adjustable rack mounting frames fitted. These frames are 1.6 mm galvanneal steel. Utilise the MFB 19″ accessory range such as shelving and power distribution to complete the configured product; the most common accessory range includes the MFB Standard shelf and the horizontal 6-outlet power distribution board. SoHo S210s can be supplied pre-assembled with accessories fitted. Alternatively, they can be supplied in kit form for onsite assembly and installation.

Soho S210s are completed in a powder coat finish. There is a series of standard colours, with special colours available on request. Size heights in RU include 4, 6, 8, 10, 12, 14 and 18. Available depths are 300, 450 and 600 mm. Custom sizes are available on request. This is an efficient solution for smaller IT storage applications.

MFB Products Pty Ltd

www.mfb.com.au

PREVENTING CYBER ATTACKS

ON SMART BUILDINGS

Smart building installations — including those based on KNX — are increasingly becoming the subject of cyber attacks.

Areas where vulnerabilities arise, and ways to keep installations secure, include:

- If an installation is linked to the internet, the use of a VPN tunnel to access it via the internet is an absolute must. When using a KNX secure tunnelling interface, be sure to use the strong passwords suggested by ETS and do not replace them with personal, weak ones.
- Special attention should go to installations in public areas, ie, where persons are able to wander around without any surveillance. Any wired automation system in this environment could be vulnerable to attack.
- Installations using wireless communication are the number one attack target, as communication between devices is completely out in the open, compared to when devices communicate over a dedicated wire. Use of KNX Secure on this medium is therefore highly recommended.
- If you have a KNX IP Backbone and other IP networks, use a VLAN separation and allow communication between the KNX IP network and other networks only via a suitable firewall.

These cyber attacks can be easily avoided in the case of KNX installations by ensuring the installation is never directly (without a VPN) accessible via the internet.

Following heavy investments from both the KNX members and KNX Association, last year and this year tangible KNX Secure products have become available. All of these products were submitted to the stringent KNX certification process, during which their conformity to AES128 authentication and encryption mechanisms were put to the test. Together with ETS, this allows the installer/integrator to now evaluate in which cases the use of KNX Secure products bring added value to the KNX installation.

The KNX Secure guide and KNX Secure checklist provide tips for ensuring a higher security in KNX installations. This checklist has been designed to make sure that people are not trying to take advantage of possible security loopholes in installations.

Switchboard system

Schneider Electric has launched the PrismaSeT switchboard as a complete system-level architecture in Australia. The sheet metal for the next-generation PrismaSeT is manufactured in Australia, and the global switchboard system has been adapted to be fully inclusive of Australian needs (CT chamber, MCB and MCCB chassis system), with a design verified to the requirements of AS/NZS 61439.1&2 (IEC 61439-1&2) standard.

Additionally, PrismaSeT presents enhanced fire safety features within the switchboard using PowerLogic HeatTag sensors for early detection of overheating wire connections or cables. The reinforced doors and frame make it easier and safer to operate and maintain the LV switchboard, as well as adding to its durability in different environments.

The active low-voltage switchboard now includes built-in cloud connectivity, providing instant access to intelligent alarming, energy usage analysis, trends and preventive maintenance plans.

The PrismaSeT system provides switchboard builders with a detailed training and onboarding roadmap with access to a dedicated partner portal that includes design and assembly guidelines, busbar drawings, quality practices and other detailed product information. It also offers EasyPrisma, a software tool to carry out compliant switchboard designs, create general arrangement layouts, sheet metal bill-of-material and switchboard costings.

The robust solution is designed to increase efficiency at every level and provide peace of mind for Schneider Electric's switchboard builder partners, electrical contractors, facility managers and end users. PrismaSeT is available Australia-wide through a network of certified switchboard builders who are comprehensively trained and onboarded before being appointed by Schneider Electric.

Schneider Electric

www.se.com/au

ENERGY NEXT
COMING TO SYDNEY

With New South Wales increasingly adopting renewable energy solutions, a major clean energy event is coming to Sydney. Organised by the people behind national clean energy event All-Energy Australia, Energy Next is a free-to-attend industry event focusing on the latest renewable energy and energy management technologies.

Energy Next offers access to leading suppliers and expert education designed to help attendees successfully implement their upcoming renewable energy projects. The event will bring together the latest solutions from clean energy and energy management companies, from solar PV to energy storage and EV charging station to energy monitoring software. Industry experts will also speak at the event's technical sessions, focusing on the latest developments and technologies that are driving projects in the sector.

Additionally, Energy Next will host the Clean Energy Council's Solar Masterclass, a one-stop shop for solar designers and installers to receive expert advice on the major design, installation and maintenance issues currently facing the rooftop solar industry.

Energy Next
www.energynext.com.au/?msclkid=e530d160c5bf11ec9854a8ae42aa00a4

What: Energy Next
When: 19–20 July 2022
Where: ICC Sydney, Darling Harbour
Register: energynext.com.au

FROM BUZZWORD TO REALITY: A 5-STEP PLAN TO ADDRESS DATA CENTRE SUSTAINABILITY

Mark Deguara, General Manager Data Centres, Schneider Electric

As Australia transitions towards a more automated and digital future, it is increasingly evident that data centres are our beating heart. More and more data flows through data centres every day, so it is essential, now more than ever, that they are secure, efficient, reliable and adaptable.

However, putting this into practice is no easy feat and requires a substantial amount of energy. According to some estimates, data centre energy consumption represents 1–2%[1] of global energy use.

Demand is only set to increase, with a recent report released by Schneider Electric finding that IT sector electricity demand is expected to grow by ~50% by 2030, reaching 3200 TWh.

The mission towards achieving overall sustainability and greener practices and policies has quickly gone from buzzword to reality for many businesses as we see more and more internet giants announcing aggressive pledges to achieve carbon neutral operations.

As more of these corporations adopt environmental, social and corporate governance goals, data centres should follow suit, starting with five simple processes.

1. Set a bold actionable strategy

Sustainability needs to be at the forefront of corporate strategies. It's no longer enough to have a separate section for environmental, social and governance (ESG) criteria; sustainability priorities need to be built into every element of organisational strategy and reporting.

This includes setting ambitious climate and sustainability targets and, using a data-driven approach, creating an actionable strategy to reach those targets. Many of today's data centre operators, from hyperscalers to cloud and colocation service providers, have already led the market by example and publicly declared ambitious commitments towards net zero, adopting more sustainable approaches to digital business.

Microsoft, for example, has started transitioning to using renewable wind energy — a trend that will likely only continue to increase as awareness of and demand for renewables from end users and governments surge.

2. Implement efficient data centre designs

Many data centres have not adapted design since their inception. There is value for data centre providers to consider new data centre designs or concepts that meet sustainability and efficiency goals — those that can be applied to new projects or used to retrofit existing facilities.

3. Drive efficiency in operations

Organisations can be more specific in their objectives and energy strategies by analysing their operations and looking to the available technology to drive efficiencies.

Software and digital services now exist to enable remote monitoring capabilities that drive efficiency in day-to-day operations in data centres. Data centre providers should be using these technologies to reduce waste at every point of their operations.

Operators should also be prioritising equipment maintenance and modernisation to optimise the life span and efficiency of their systems. This simple process saves costs in the long run and can reduce the emissions cost of procuring new equipment and systems.

Although some of the boxes are checked, there are other components to consider that could contribute to further significant gains. The focus on large data centres has really paid off and now organisations need to focus on edge IT, telco edge and everything within the digital infrastructure ecosystem that is outside of those big data centres.

4. Buy renewable energy (PPA and onsite)

Data centre providers would be wise to consider a custom renewable procurement strategy. This may include microgrids, PPAs, VPPAs, energy-as-a-service and EACs.

Many of the hyperscalers are now buying renewable energy; however, much of that energy is actually used elsewhere, while fossil fuel-based energy is consumed in their data centres. While buying renewable energy to be used by others is laudable, to truly minimise the environmental impact of a data centre project, data centres need to use locally generated renewable power.

Many data centres are built in out-of-town locations where land is relatively cheap. There is significant opportunity to buy additional land and locate some renewable power generation directly adjacent to the data centre. This has the effect of eliminating transmission losses, genuinely minimising environmental impact.

In 2015, Swedish energy company Falu Energi & Vatten and entrepreneurial firm EcoDC AB built the EcoDataCentre, an approximately 5.75-acre data centre facility powered from only renewable energy sources, such as solar, wind, water and biofuels. In addition, heat generated by the data centre — which would otherwise be wasted — is used in the district's heating and cooling systems for an overall environmental plus. The outcome was significant gains in efficiency and lowered operating costs.

5. Decarbonise supply chains

Finally, it is not enough to do this alone. The industry needs to work together towards sustainability, and each operator needs to look beyond its own operations. This includes evaluating Scope 3 emissions (those indirectly resulting from the operator's supply and value chain) and identifying and executing strategies to meet decarbonisation objectives.

While tracking Scope 3 emissions can be a considerable time investment, it can have a substantially positive impact on sustainability. More often than not, tracking requires a screening assessment of all categories of Scope 3 to ensure that the organisation is targeting the sources with the largest emissions. There are numerous coalitions that exist to help identify the primary data of suppliers, assess its quality, remove outliers and calculate a comprehensive carbon footprint. This process often helps distil feasible strategies to reduce emissions going forward.

In its November 2019 report, Global Market Insights estimated the size of the Green Data Centre Market at over US$6.5 billion in 2018, with a projected increase of 23.5% CAGR from 2019 to 2026.[2] While incorporating sustainability into their practices may seem overwhelming for many established data centre providers, if they fail to do so they may very quickly be left behind.

There are actionable ways providers can build efficient data centres with sustainability embedded into the core of their operations. These actions may seem hard now, but they will be increasingly important as more customers base their decision-making on working with those organisations that have a green agenda.

With the right advice, strategy and commitment, data centres can become more sustainable, and this can have important consequences for their efficiency, security and performance.

References

1. Linda Zhang and Robert Bunger, Schneider Electric – Energy Management Research Center White Paper 64, 'Why Data Centers Must Prioritize Environmental Sustainability: Four Key Drivers'.
2. https://www.gminsights.com/industry-analysis/green-data-center-market.

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CASE STUDY

Safer networks through geodata

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Geodata company Fugro has delivered a digitised power network management system to Waipa Networks in New Zealand, with the aim of improving safety and reliability across the electricity provider's entire distribution network. Waipa, assisted by utilities management consulting firm Utilligent, chose Fugro to modernise its asset management framework based on the enhanced network insights Fugro's technology could provide. Fugro's ROAMES technology, a network risk model, is now allowing Waipa to visualise and mitigate ground clearance threats, vegetation encroachment issues, structural safety distances risks, dangerous pole leans and any asset defects.

The project was completed in three phases. First, Utilligent helped Waipa select Fugro and the ROAMES product suite to develop a 3D virtual world asset model to collect and store lidar and pole-top imagery geodata. Next, Fugro and Utilligent worked closely to develop a business intelligence (BI) tool, which was used to prioritise and mitigate issues, risks and defects. Finally, although GPS coordinates existed for each asset, this project served as a great opportunity to update anomalies and create a 'Record of Truth' for Waipa. This new level of accuracy gives the company the tools and insight to expedite work orders, and supports Waipa's mission to provide cost-effective and reliable systems for electricity and other services.

Peter Armstrong, Waipa's Network Asset Manager, said, "The aerial survey program and the associated data analytic tools have given us a comprehensive view on our overhead network data and condition that we have never had before. Meanwhile, the Fugro ROAMES analytic outcomes are driving actional reporting, which will greatly assist in our ongoing management of the assets."

Jay Reseigh, Utilligent's Vice President, Data and Analytics, said that this type of project had transformed the industry. "Gone are the days of walking the lines and taking photographs of poles from the ground, which often takes years. The spatial analytics provided by Fugro ROAMES dramatically reduce the time required to inspect the network, allowing Waipa to quickly identify hazardous scenarios and set the foundation for utilities' advanced distribution management system (ADMS) programs. The business case speaks for itself."

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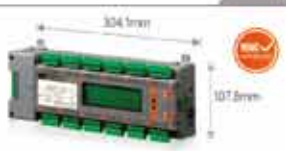

MODEL	EM133XM	BFM136	BFM-II
INSTALLATION TYPE	SMALL	MEDIUM	LARGE
^ELECTRICITIES Tenants	Up to 3	Up to 36	Up to 54
UTILITIES Water, Gas	Up to 14	*Up to 72 With BFM utility module	Up to 72

Electrical components for machinery

- Motor protection circuit breakers
- Switch disconnectors

- Contactors
- Motor protection relays
- Elctromechanical starters and enclosures

- Control and signalling units
- Limit, micro and foot switches, safety relays
- Cam switches
- Time relays

- Protection relays
- Power Supplies
- Metering instructments and current transformers
- Soft starters

- Variable speed drives
- PLCs and HMIs
- Servo motors and drives

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