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SMART ELECTRIC GRIDS

HOW THE IoT
COULD TRANSFORM COVID SAFETY IN BUILDINGS

MARCH 2022
VOL.21 NO.1

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FROM THE EDITOR

As the first issue of ***ECD*** for 2022 lands, change is in the air. With Australian borders recently reopened to vaccinated international travellers, along with the easing of other restrictions, smart technology has real potential to help manage the pandemic safely enough for people to lead relatively normal lives. On top of this, there's the ongoing need for greater efficiency in the face of climate crisis — an especially hot topic in the lead-up to May's federal election. This issue looks at the ways intelligent, responsive technology can tackle these challenges.

In our feature article, ***ECD***'s outgoing editor Amy Steed explores the complexities that accompany increasing adoption of smart city technology — and the strategies that are being developed to handle them. Pierlite's Lydell Stokes describes ways in which IoT connected ecosystems can support COVID safety in the workplace, including sensor-driven heatmaps that show foot traffic movement and density in offices in real time.

'Reimagining power: smart electric grids' shows us the prospect of transactive energy systems — those that rely on an agreement between consumers and utilities to achieve flexible control over supply and use patterns — on a radically large scale. In a Q&A at the back of the magazine, Mark Anning takes us through AS/NZS 61439, an updated switchgear and control gear standard with implications for all industries.

As Amy moves on to edit one of our company's larger titles, it's exciting for me to come on board as this magazine's new editor, especially at a time when the automation and energy industries are responding to such significant global challenges.

Katerina Sakkas — Editor
ecd@wfmedia.com.au

THE RISE AND RISE OF THE GLOBAL SMART CITY

Amy Steed

Urbanised populations around the world are on the rise, bringing with them an increase in the adoption of smart city technology.

According to the report 'Smart City Platform Market – Growth, Trends, COVID-19 Impact, and Forecasts (2022-2027)', smart city spending on a global scale is expected to reach US$34.35 billion by 2026.

Most smart infrastructure, including lighting systems, intelligent grids, security and control systems, and renewable power, relies on IoT technology to monitor its output and operation.

As smart city projects across the world have multiplied, the way in which these technologies function has become layered and more complex. The 'Smart City Platform Market' report suggests that in order to simplify these complexities, the market will witness a strong drive toward the implementation of more intuitive processes, including the increased adoption of machine learning solutions to gather and analyse the huge amount of generated data.

Using machine learning to build greener smart cities

While cellular networks are the foundation of smart cities, they consume a lot of energy, enhancing global warming. One way to address this issue is by switching off base stations — radio transmitters/receivers that serve as the hub of the local wireless network — when they have little to no traffic load.

Research has found that active base stations consume as much as 60% of their maximum energy consumption, even under no traffic load, and switching them off can bring energy use down to 40%. However, there is a trade-off: putting base stations to sleep makes their traffic logs unavailable, which also reduces the accuracy of traffic prediction.

A study led by Professor Ryoichi Shinkuma from Shibaura Institute of Technology (SIT), Japan, and his colleagues from Muroran Institute of Technology and Kyoto University, proposed a scheme that not only reduced energy consumption but demonstrated a higher traffic prediction accuracy compared to the benchmark schemes.

"We applied software defined network (SDN) and edge computing to a cellular network such that each base station is equipped with an SDN switch, and an SDN controller can turn off any base station according to the traffic prediction results. An edge server collects the traffic logs through the SDN switches and predicts traffic volume using machine learning," Shinkuma said.

The machine learning method used by the researchers decided which base stations could be put into "sleep mode" based on the importance of their traffic logs in improving prediction accuracy. Thus, base stations with low contribution to the accuracy for previous time slots were put to sleep at the next slot to save energy.

To validate their study, the researchers used real-world mobile traffic data collected over two months and compared its performance against that of two benchmark schemes. The new scheme outperformed the benchmark schemes in its robustness against reducing the number of active base stations and different base station sets.

Shinkuma is optimistic that the study could be a harbinger of greener cellular networks and smart cities.

"By intelligently controlling the operation of base stations, renewable energy sources could be used to power future networks and, depending on the availability of renewable energy resource, the sleep schedules of the base stations can be determined," he said.

How has COVID-19 impacted on smart city development?

The COVID-19 pandemic has highlighted a pressing need to invest in connectivity infrastructure. According to KPMG's report 'Smart City Transformation in a post-COVID world', smart city transformation is no longer a "nice to have" — rather, it has now become a must. The pandemic has resulted in citizens around the world experiencing varying levels of isolation and an overall lack of connectedness. The report highlights that "as countries emerge from the immediate crisis, there is an opportunity to improve connection by embedding digital infrastructure and Smart City initiatives as part of the business-as-usual design, development, operation and maintenance of our cities."

There is a range of different network technologies, such as 4G/5G, broadband, Wi-Fi and low-power wide-area networks (LPWANs), that can be used for this purpose. The KPMG report emphasises that connectivity networks are critical to enable the continued operations of essential services, such as telehealth, as well as to support people in remaining connected and maintaining their overall wellbeing. In fact, the NBN, which is now available to at least 95% of Australian households, saw connectivity demand increase by more than 70–80% during daytime hours in March 2020, compared with February that same year.

Future trends for smart cities

One of the significant factors expected to drive the growth of the market in smart cities is giving priority to platform providers rather than standalone smart solutions, because of the potential scalability and integration of other smart solutions.

North America has emerged as the dominant regional market for smart cities in terms of revenue, as well as having a strong foothold in the market for smart city platform vendors. According to Smart America, governments in cities across the US could invest up to US$41 trillion over the next two decades, simply by upgrading their infrastructure to leverage the benefits of the Internet of Things.

In addition, the 'Smart City Platform Market' report notes that some smart cities are implementing eGovernment initiatives, which serve to improve public sector efficiency and streamline government systems to support sustainable development. For example, Huawei e-Government is designed to improve government networks, cloud, collaborative offices, multi-dimensional security, and operational efficiency.

Finally, increasing urbanisation has led to higher volumes of traffic in most cities around the world, and the subsequent need for a next-generation traffic monitoring and management solution. The deployment of traffic cameras in cities is often hampered by a lack of or subpar autonomous video monitoring systems that require cloud access or extensive high-bandwidth internet infrastructure.

Ultimately, the smart city platform market is a fragmented one, with a large number of companies providing these platforms across the globe. Market players are constantly evolving and innovating smart solutions, spending huge sums of money on research and development — meaning that smart cities will continue to be a highly competitive market well into the future.

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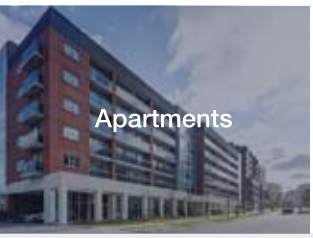

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RAPID SOLAR EXPANSION IN WA

Western Australia's solar uptake has grown over 600% since 2011, with residential solar output now exceeding the state's largest power station.

Households are embracing renewable energy technology at record rates, with 3000 homes now installing rooftop solar panels each month.

Last year, WA households added 191 megawatts (MW) of generation capacity to their rooftops, bringing the total amount of residential solar capacity in the South West Interconnected System to 1362 MW.

More than 400,000 WA homes and businesses — around 36% of customers — now have rooftop solar connected to WA's main grid.

The collective capacity of residential solar generation exceeds the gross output capacity of WA's largest power station — Synergy's 854 MW Muja Power Station.

This unmanaged energy presents challenges on mild sunny days when rooftop solar generation is high and demand from the system is low.

To enable the continued uptake of rooftop solar panels on WA homes and avoid blackouts, the government has introduced a range of policies, products and initiatives.

These include the new Emergency Solar Management rules which start on 14 February, community battery storage trials, virtual power plants and WA's biggest battery in Kwinana.

"Over the past 10 years rooftop solar has increased by over 600%, with 50% of WA households expected to have solar panels by 2030," Energy Minister Bill Johnston said.

"These rapid changes to the energy landscape have presented a range of challenges and opportunities, which we are addressing to ensure electricity remains affordable and reliable.

"The McGowan government continues to support the uptake of residential solar, batteries and electric vehicles, and is committed to net zero carbon emissions by 2050."

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SHELLEY ELLIOTT NAMED 'SPARKIE OF THE YEAR'

Third-year electrician-in-training Shelley Elliott has been awarded the title of Apprentice of the Year by TAFE SA and electrical equipment and accessories provider Clipsal by Schneider Electric (Clipsal). Part of the 'Sparkies Scholarship' program, the highly contested award saw Shelley beat nine of her peers to win a $5000 grant to kickstart her career.

Presenting to a panel of five judges, Shelley and her fellow sparkies participated in an intensive 4-month competition, with each apprentice challenged to learn how to manage their own business while undertaking hands-on training in the latest electrical products, including Clipsal's Wiser Smart Home technology. The final challenge invited participants to present an innovative business plan for their own electrical servicing business.

Speaking about the program, Elliott said, "I signed up to the program to meet new people, get familiar with industry-leading electrical products and learn how to run my own business from TAFE SA's industry experts."

Each student selected a customer persona and was tasked with developing an angle to support sales with their customer segment. Elliott chose the 'outsourcers' audience: those who wanted to upgrade their home but didn't have the time or knowledge to tackle it.

"The program opened my eyes to understanding what the customer wants and working with them directly, as well as with the contractor," Elliott said. "For the next generation of sparkies, I could not recommend this apprenticeship program more highly. To go on to win the coveted Sparkie of the Year award is one of the greatest achievements in my career so far."

David Moore, Partner Programs Manager at Clipsal, commented, "It was extremely important for Clipsal and TAFE SA to create a well-rounded program that mixed real-life experience, access to the latest technology while pushing students to think outside of the box when it came to solving common business challenges.

"The award recognises the apprentice who performs the best academically and in the field by undertaking a special task created by Clipsal. By partnering with TAFE SA, the program produces well-rounded talent that will go on to become the leading electricians of the future."

Taking students out of their comfort zone was central to helping them develop professionally, said Scott Fereday, Principal Lecturer at TAFE SA. "Our students stepped up to the plate, demonstrating their business savvy to a real-world challenge while offering an innovative proposition to their nominated customer."

Moore added, "Diversity of education and experience sets the Sparkie Scholarship program above the rest. The future is bright for the next league of sparkies coming up the ranks and we look forward to kicking off the program again in 2022."

The scholarship is open to third-year TAFE SA electrical apprentices, selected by TAFE SA across its nine delivery campuses. TAFE SA trains approximately 1500 electrical apprentices annually. Clipsal provided specialised training and mentoring through leading electricians from the Club Clipsal program, undertaking hands-on sessions with the latest technology and products.

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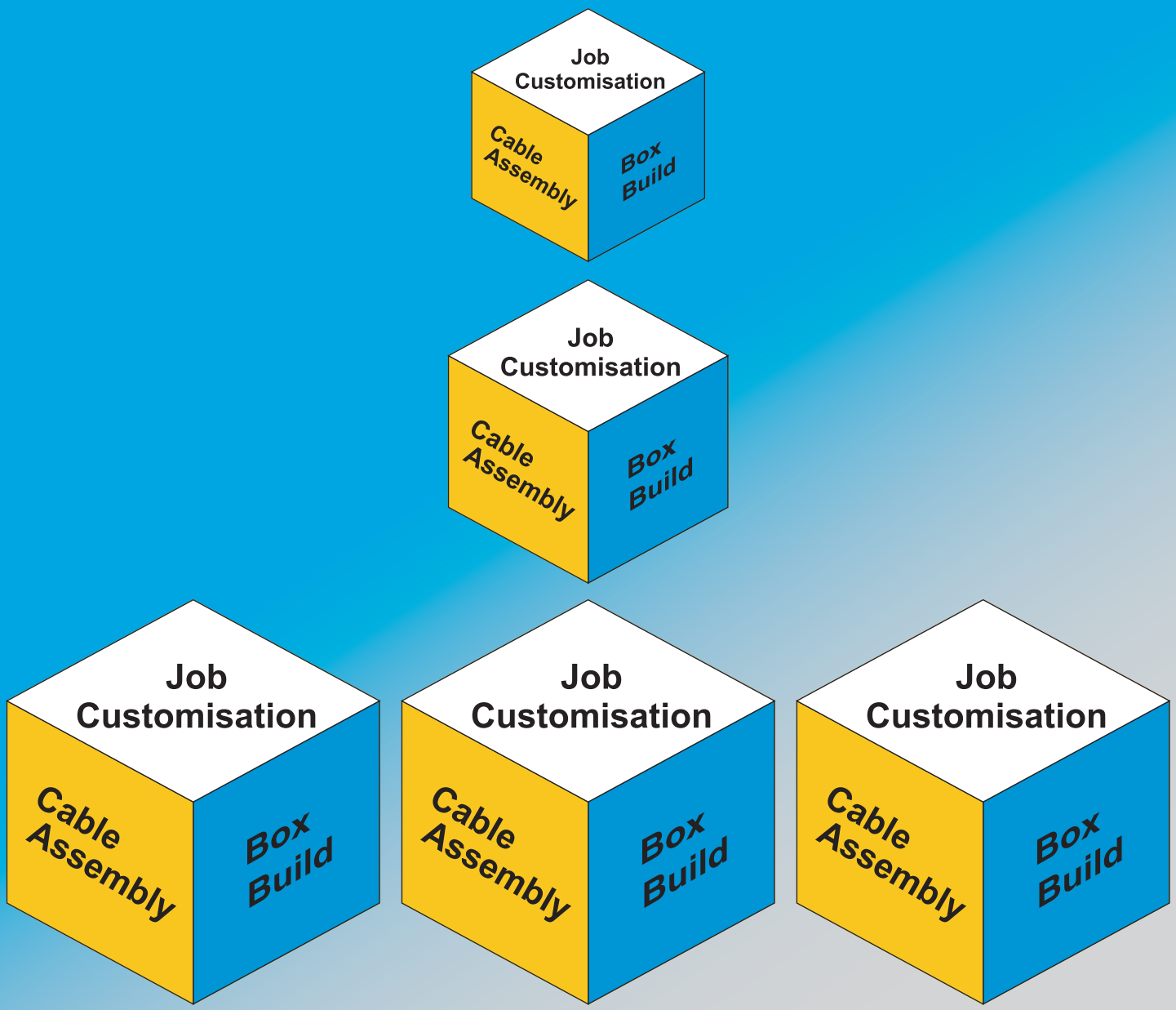

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QLD GOVT STRESSES IMPORTANCE OF ENERGY CAREERS

A new intake of 12 Ergon Energy apprentices began training recently in Rockhampton, taking the total number of Ergon and Energex apprentices currently in training across Queensland to 500, according to Treasurer and Minister for Trade and Investment Cameron Dick.

"There are few careers in Queensland as important to our state's ongoing prosperity as an energy worker," the Treasurer said.

"Ergon workers are who communities across Queensland turn to in times of storm and cyclone.

"The work they do to restore power in the most trying conditions is nothing short of remarkable, and a testament to their dedication and training."

But what these apprentices can do for Queensland goes far beyond recovery from natural disasters, the Treasurer said.

"They are our frontline in our relentless journey to becoming a renewable energy superpower."

Minister for Energy Mick De Brenni said the Palaszczuk government was determined to continue investment in skills, training and regional jobs.

"This state's publicly owned energy companies already have a 9500-strong workforce — a workforce at the heart of economic activity and prosperity in this state," he said.

"And because of the Palaszczuk government's focus on jobs, skills and training, they are joined by an ever-growing number of apprentices."

Stressing the importance of keeping Ergon and Energex publicly owned, the Minister cited the Royal Commission into the 2009 Black Sunday bushfires:

"We only have to look to Victoria to see the effects of privatisation where the Royal Commission into their devastating Black Saturday bushfires found that their private network hadn't taken on a new apprentice in 10 years; and as a result a lack of skills and a lack of investment led to tragedy."

The Treasurer said the Queensland Government was continuing to invest heavily in training to equip more Queenslanders with the skills they need for jobs in both emerging and traditional industries.

"In addition to our free TAFE and apprenticeship programs, we've committed $320 million over four years to continue the Skilling Queenslanders for Work initiative, as well as an ongoing fund of $80 million a year beyond that to lock it in permanently," he said.

GLG TO SELL PIERLITE BUSINESS TO MULTINATIONAL LIGHTING COMPANY SIGNIFY

The Board of Gerard Lighting Group (GLG) has signed a contract for the sale of GLG's Pierlite business to Signify N.V. (Signify), a leading multinational company focusing on lighting and technology solutions.

Formerly known as Philips Lighting and headquartered in the Netherlands, Signify provides lighting for professionals and consumers, as well as lighting for the Internet of Things (IoT). The company is active in more than 70 countries, with over 37,000 employees and annual 2021 sales of EUR6.9 billion. Its portfolio of well-known lighting brands includes Philips, Philips Dynalite, Philips Hue, Interact, Color Kinetics and WiZ.

GLG's Pierlite business is one of Australia and New Zealand's oldest and largest lighting and technology companies, with a portfolio of 14 brands that cater to commercial, industrial, healthcare and education customers. Pierlite's solutions include a portfolio of LED luminaires, connected IoT ecosystems and Design on Demand solutions via its Beyond Light offering. In Australia and New Zealand, Pierlite also offers local design and engineering, scalable product assembly and a strong network of partners and suppliers, as well as what is said to be the Southern Hemisphere's largest lighting laboratory.

In announcing the sale of Pierlite, GLG Chairman Ben Sebel said Signify's scale and worldwide footprint will rapidly accelerate Pierlite's growth and enable the business to better service the ANZ market.

"We're very proud of the growth achieved by Pierlite in Australia and New Zealand over its 70-year history, bringing world-class lighting solutions to market, establishing a robust worldwide network of suppliers and partners, and importantly, delivering on large-scale projects to meet the needs of our customers," Sebel said.

"This deal represents the beginning of the next chapter for Pierlite as it joins the Signify portfolio. This is a natural home for Pierlite, bringing together two companies with highly complementary operations and a deep culture of innovation. It brings significant opportunity for Pierlite to scale up its offering in the ANZ market, supported by the resourcing and capabilities of a world leader."

Pierlite's operations, including its workforce, management structure and existing pricing and supply arrangements will remain unchanged. The sale process is expected to be completed in the first half of 2022, subject to customary closing conditions.

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HOW IoT CONNECTED LIGHTING COULD TRANSFORM COVID SAFETY IN BUILDINGS

Lydell Stokes, National Manager – Future Markets, Pierlite

The COVID-19 pandemic has driven a paradigm shift in how we as a nation understand public safety.

In the past couple of years since the pandemic emerged, we have seen schools, offices, shopping centres and restaurants repeatedly closed due to transmission risks. Prior to 2020, these were environments previously considered 'safe' by regulators and occupants. Today, safety has a new meaning.

We are now approaching a promising breakthrough on the road to reopening, with (at the time of writing) 94.4% of Australians aged 16 and over fully vaccinated.

While the prospect of reopening is good news for asset managers and businesses, it does not mean a return to the old ways. Even with a vaccinated population, it is evident COVID-19 is here to stay. To remain open, offices, schools, shopping centres and entertainment venues will need to prepare to operate with COVID, placing new safety procedures at the forefront of operations.

To achieve this, asset managers today are already implementing a new class of interconnected technologies set to revolutionise COVID safety, reduce transmission risk and assist with contact tracing.

Characterised by cloud technology, sensors, controls and analytics, connected ecosystems remain one of the fastest growing technology segments for built assets, forecasted to grow to $21 billion by 2023 as found by Omdia.

This article will discuss how asset managers across Australia and New Zealand are preparing to utilise the capabilities of IoT connected ecosystems to support COVID safety.

Creating building occupancy heatmaps

With a new focus on COVID-19 safety, it is critical for asset managers to have a clear understanding of how building occupants, such as office staff or retail customers, move through rooms and spaces. It also makes sense for facility managers to know how densely populated rooms are in real time and receive alerts if there are breaches to density limits.

By equipping rooms with state-of-the-art sensors serving live and historical data to cloud dashboards, asset managers can create occupancy heatmaps that show both foot traffic movement and the density of each room in real time. This enables asset managers

to identify hotspots for potential transmission and receive alerts when rooms reach their limits.

Over the past year, the team at Pierlite have delivered smart ecosystems at multiple commercial, healthcare and industrial sites across Australia and New Zealand, with one of the primary goals being to heatmap building occupancy and measure how these metrics change over time. The company has also experienced the benefits first-hand in its own offices, where it has deployed light fittings with embedded sensors to monitor and track major building metrics related to occupancy, movement, ambient light and noise, and air quality, amongst other things.

COVID-19 contact tracing

IoT connected ecosystems can also be implemented to support COVID track-and-trace protocols. In office buildings, for example, sensor networks embedded in light fittings can be used to identify occupants or assets using Bluetooth Low Energy (BLE) beacons that connect with an occupant's key fob or other piece of equipment. In fact, some people counters don't even need occupants to hold a key fob or other device to measure occupancy levels.

If a COVID-positive case is identified to that location, cloud dashboards can be used to analyse historical data and identify which occupants came in close contact to the COVID-positive case. Dashboards will show where that individual went within the building, and when. Systems can also be configured to automatically send real-time alerts to building managers, ensuring those occupants get tested and isolate quickly.

Monitoring air quality

It has long been a safety requirement that built assets provide spaces that are well ventilated, clean and ideally free of toxic, volatile or organic compounds. In future, asset managers must have a renewed focus on ensuring occupants can access air that is free of pathogens like viruses, as well as ensuring effective circulation to minimise the risk of transmission.

Today, systems allow hospitals and office buildings to implement elegant technologies that can monitor air quality in real time. As an example, by using luminaires with both embedded and standalone sensors asset managers are able to detect the presence of harmful air molecules and optimise heating, ventilation and air conditioning (HVAC) settings to control temperature, humidity and CO_2 levels, and make changes to the airflow as required.

Rendering pathogens inert

Monitoring air quality and optimising air flow is important, but we see the capabilities of IoT ecosystems reaching far beyond this. There is significant potential for asset managers to utilise these IoT products to physically inactivate pathogens — including viruses — and scrubbing them from the circulating air.

One solution is a connected air-scrubbing luminaire that uses certain wavelengths of UV and filtration technology to inactivate and remove airborne microorganisms. The product does this by first irreparably damaging their molecular structure using UV and then scrubbing them from the air using filtration technology. It is entirely safe to operate and highly effective against both COVID-19 as well as other viruses like influenza. This fitting can be applied in offices, airports, health facilities and schools, with huge potential to help set new standards of safety and ultimately deliver greater health and wellbeing outcomes.

A significant task lies ahead for Australian and New Zealand asset managers as they look to implementing new COVID-safe procedures that will keep occupants safe and healthy. The potential for smart connected ecosystems to play a key role in delivering better COVID safety outcomes is significant.

These capabilities are just the beginning of a bright future for smart connected ecosystems. This is a rapidly growing market segment — and through continuous innovation, we may begin to see new capabilities emerge that will truly empower both asset managers and building occupants in the new world.

Pierlite Australia Pty Ltd
www.pierlite.com.au

Single-pair Ethernet cable

LAPP has released the ETHERLINE t1 Y Flex 1x2x22/7 AWG cable — a UL-certified, single-pair Ethernet (SPE) cable for high-speed information exchange that should significantly reduce set-up.

Due to its small bending radius and small outer diameter, it is lightweight, easy to install and useful for connection at the field level.

The Power-over-Data-Line compatible cable complies with IEEE 802.3bu and has been specially designed for transmitting digital signals in the frequency range up to 600 MHz over distances of up to 40 m. It enables a simultaneous power and data supply to SPE terminals with low energy consumption (up to 50 W).

The design of the SPE cable provides protection against electromagnetic interference. Due to an aluminium-laminated foil and copper braid screening with a high degree of coverage (SF/UTP), it is double shielded. In addition, the PVC outer sheath is resistant to acids and alkalis and is partially oil resistant. As a UL/CSA-certified Power Limited Tray Cable (PLTC), the single-pair Ethernet cable can also be installed openly on cable trays.

The product opens up a host of futureproof possible applications in automation technology. Applications include: use in dry and damp rooms, as well as for medium mechanical stress; structured cabling in compliance with DIN EN 50173 and ISO/IEC 11801; and single-pair Ethernet applications — 1000Base-T1 in compliance with IEEE 802.3bp and 100Base-T1 in compliance with IEEE 802.3bw.

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Alarm horn sounders, beacons and combined signals

The E2S AlertAlarm, AlertAlight and Sonora ranges of alarm horn sounders, beacons and combined signals are designed to provide reliable and effective alarm notification in harsh environments.

Mechtric and E2S have announced significant upgrades to the AlertAlarm and AlertAlight series that will progressively come into effect over the next 2–3 months. These include wider voltage range; increased sound output; 64 tones with 4 stages with dual DIP switches for independent second stage; dual cable entries; and extended temperature range: -40 to +66°C/-40 to +151°F.

There will be enhanced enclosure configuration including back box options that provide dual 20 mm cable entries, and stopping plugs supplied as standard.

New electronics for the A100 include up to 110 dB(A) @ 1 m (101 dB(A) @ 10'); DC voltage range: 10–60 VDC; and AC voltage range: 24–260 VAC 50/60 Hz.

For the A105N it includes up to 113 dB(A) @ 1 m (102 dB(A) @ 10'); DC voltage range: 10–60 VDC; and AC voltage range: 24–260 VAC 50/60 Hz.

For the A112N it includes up to 120 dB(A) @ 1 m (111 dB(A) @ 10'); DC voltage range: 10–60 VDC; and AC voltage range: 100–260 VAC 50/60 Hz.

For the A121 it includes up to 124 dB(A) @ 1 m (115 dB(A) @ 10'); DC voltage range: 10–60 VDC; and AC voltage range: 100–260 VAC 50/60 Hz.

Global accreditations as standard are UL/cUL/ULC approved for fire and general signalling; UL EU approved to EN54 standards — CPR compliant (A105 and A112N); DNV type approved (A105 and A112N); and MED compliant — DC and AC voltages (A105 and A112N).

E2S products are distributed in Australia by Mechtric and are available from electrical wholesalers.

Mechtric Pty Ltd

www.mechtric.com.au

Energy storage systems

Tesvolt energy storage systems have a total capacity of up to 40 MWh. The intelligent battery storage solutions offer hydrogen electrolysers a power supply when solar or wind systems fail to produce sufficient energy.

Even if the public power grid fails, the storage systems provide an uninterruptible power supply for all users.

Tesvolt Australia

www.tesvolt.com.au

Instrument enclosures

METCASE TECHNOMET instrument enclosures can be specified in custom colours — even in low volumes. Options range from trim and bezel highlights to bespoke colours for the whole enclosure.

TECHNOMET desktop and portable instrument enclosures are suitable for medical and wellness devices, test and measurement equipment, industrial control, peripheral devices and interfaces, switchboxes, communications and laboratory equipment.

They are engineered to fine tolerances to offer modern and cohesive design. Diecast front and rear bezels fit flush with the case body for a smooth appearance. Snap-on trims hide the fixing screws. All sizes are available with either a tilt/swivel carry handle (that doubles as a desk stand) or ABS side handles. Three sizes offer a sloping front bezel.

TECHNOMET's base panel is pre-fitted with four M3 PCB mounting pillars — and the internal chassis is pre-punched for installing snap-in PCB guides (accessories) in three, five, seven or nine positions. The removable rear panel is recessed to protect connectors and switches; the accessory anodised front panel is also recessed to protect keypads and displays. All case panels are fitted with M4 threaded pillars for earthing connectors. Each enclosure is supplied with four ABS feet with non-slip pads.

The aluminium enclosures are available in 11 sizes from 225 x 200 x 75 mm to 350 x 320 x 150 mm. The standard colours are light grey (RAL 7035) or anthracite (RAL 7016) — and custom colours cost no more than standard.

Accessories include front panels, a PCB mounting kit, PCB guides and PCB/panel fixing screws.

In addition to special colours, customising options include bespoke sizes, CNC punching/machining, fixings and inserts, digital printing of legends and logos.

ROLEC OKW Australia New Zealand P/L

www.metcase.com.au

Electric vehicle charger

IPD is the master distributor of the ABB Terra AC Wallbox electric vehicle (EV) charger in Australia. The Terra AC Wallbox EV charger is built from quality materials, has an innovative design and smart technology functionality, and is suitable for charging electrical vehicles in private and large residential units, office buildings and commercial premises.

The unit has the ability to manage its load through a built-in energy meter and additionally can be set up for external energy meter integration, whether it is a personal preference or legal requirement under the NCC. The Terra AC Wallbox has been designed as a single-phase 7.4 kW and three-phase 22 kW in an IP54 enclosure with a Type 2 socket or integrated cable. Connectivity to the unit is available via Bluetooth, Wi-Fi and ethernet connection.

Safety is a critical factor in all electrical products, and the Terra AC Wallbox EV charger is no different. This unit has a range of safety features built in, including integrated DC earth leakage protection, overvoltage and undervoltage monitoring, and surge protection.

With optimal charging and smart functionality, the Terra AC Wallbox EV charger is a cost-effective, intelligent and user-friendly product.

IPD Group Limited
www.ipd.com.au

Cable and network tester

The Fluke LinkIQ Cable+Network tester combines switch diagnostics with cable measurement technology. The product provides simple pass/fail test reports using Fluke's LinkWare software. It can also verify the performance of switches, including those that provide Power over Ethernet.

The LinkIQ is based on a single-test approach that automatically provides the appropriate measurements based on what's at the other end of the cable. For an open cable, it shows the length and pairing. If it's terminated with the supplied remote, the test result shows the maximum data rate the cable can support — up to 10 Gbps. If the cable is connected to a switch port, LinkIQ will show the name of the switch plus the port name, speed and duplex. If PoE is advertised, it will display the power and class (up to 90 W or Class 8) and then load the switch to verify the power can be delivered.

Fluke Networks
www.flukenetworks.com

Uninterruptable power supply

Schneider Electric has extended its Easy UPS 3L from 250 to 600 kVA (400 V) with the addition of 250, 300 and 400 kVA three-phase uninterruptable power supplies (UPSs) for external batteries.

The Easy UPS 3L is designed to simplify and streamline configuration and service, delivering high availability and predictability to medium and large commercial buildings and light industrial UPS applications.

With its compact footprint, highly available parallel and redundant design, and robust electrical specifications, the product protects critical equipment in a wide range of environments from damage due to power outages, surges and spikes. It is up to 96% efficient to bring predictability to utility costs. It includes a wide battery voltage window and accommodates a variety of battery configurations. It comes with a full range of options and accessories, making it easy to integrate into different environments.

Schneider Electric
www.se.com/au

Smart solutions enabling smarter operations

Milad Mostowfivala, Digital Lead, ABB Australia

It's no secret — all operational managers are intensely aware of the urgent need for smarter efficiency. As complexity of managing electrical assets increases across facilities of every size, ensuring reliability of such equipment in the long-term becomes crucial both in terms of the health of this equipment and in terms of consistent cost saving that this equipment would require while running and in service.

A forward-thinking approach in conducting maintenance practices and optimisation strategies must be adopted to meet such requirements.

When it comes to meeting operational complexity head on, your facility's data is your greatest ally. By transforming data into actionable insights, you can uncover opportunities for improvement, mitigate risk and create more sustainable processes.

Though many are wary of introducing more complexity into operations, the fact is that it's never been easier to harness data that supports your expertise.

How can data help me prioritise maintenance actions?

By clearly communicating asset performance and identifying what needs most urgent attention.

- **Deep dive:** Explore each asset's diagnostics and prognostics and view condition indicators for relevant components eg, environmental, electrical, dielectric, mechanical and thermal.
- **Check condition labels:** Diagnostic algorithms clearly designate each asset's condition, labelling assets from 'Very poor' (mostly failed, urgent action required) to 'Very good'.
- **Prioritise:** Based on condition indications, you can efficiently assign maintenance where there is a higher probability of failure and criticality.

How can data help me predict faults?

By letting you combine historic information with real-time analytics.

- **Continuous condition monitoring:** Sensors constantly monitor for the possible failure causes in your assets. It means you can track things like electro-mechanical performance in circuit breakers and monitor temperature/ environmental parameters without having to regularly halt production.
- **Actionable insights:** Used in combination with sensor data, analytics can highlight potential abnormal conditions before failure occurs, eg, alerting operators if trends indicate temperature could rise above a safe threshold.

Moving towards predictive maintenance means you're always one step ahead, avoiding high-cost unplanned labour and maintenance and extending asset lifetimes by up to 15%.

How can data empower my team and keep them safe?

By letting you communicate real-time insights to your people, wherever they are.

- **Real-time updates:** Keep operators safe from anywhere with up-to-the-minute insights and data notifications. This allows them to plan in advance, take appropriate action faster and observe the right safety precautions.
- **Remote scheduling:** Analytics and insights allow you to streamline maintenance planning, assign field service and track activities/reporting, so everyone can see exactly what they're doing.

Without your knowledge and expertise, data and insights are nothing but figures on a screen. Data is undeniably powerful but it's your asset management strategy that determines whether assets boost or create a drag on business results.

By placing data at the foundation of your strategy, an asset management solution brings tangible benefits to operations. Its functionality actively extends your insight, acting as your eyes and ears across your entire facility.

Through digital asset management technologies, such as ABB Ability™ Energy & Asset Manager, giving you access to data across asset health, events and alerts, maintenance prescription and documentation, it's truly never been easier to unlock your site's potential and power a more sustainable future.

ABB Australia Pty Ltd
https://campaign.abb.com/ABB_Ability_Energy_and_Asset_Manager

Electric vehicle charger

The ABB Terra 360 all-in-one electric vehicle charger is a modular charger which can simultaneously charge up to four vehicles with dynamic power distribution. This means that drivers will not have to wait if somebody else is already charging ahead of them — they simply pull up to another plug.

The charger has a maximum output of 360 kW and according to the company is capable of fully charging any electric car in 15 min or less, meeting the needs of a variety of EV users, whether they need a fast charge or to top their battery up while grocery shopping.

The charger's lighting system guides the user through the charging process and shows the state of charge (SoC) of the EV battery and the residual time before the end of an optimal charge session. The fast EV charger is also wheelchair accessible and features an ergonomic cable management system that helps drivers plug in quickly with minimal effort.

As well as serving the needs of private EV drivers at fuelling stations, convenience stores and retail locations, Terra 360 chargers can also be installed on an organisation's commercial premises to charge electric fleet cars, vans and trucks. This gives owners the flexibility to charge up to four vehicles overnight or to give a quick refill to their EVs in the day. Because the chargers have a small footprint, they can be installed in small depots or parking lots where space is at a premium.

Terra 360 chargers are fully customisable. To personalise the appearance, users can 'brand' the chargers by using different foiling or changing the colour of the LED light strips. There is also the option to include an integrated 27″ advertisement screen to play video and pictures.

ABB Australia Pty Ltd
www.abbaustralia.com.au

Voltage attenuator

ICP DAS's DNM-843VI-600V is a 3-channel, 600 VDC voltage attenuator with channel-to-channel isolation. The maximum input range is from ±80 to ±600 V and can be attenuated to ±10 V.

The 'I' version provides 3000 VDC intra-module isolation and 3000 VDC channel-to-channel isolation to avoid the noise interference from inputs to outputs or channel to channel. It can be used with the analog input modules, such as I-7017 and I-87017, to measure high voltage.

The series supports DIN rail mounting, with a metal casing that allows it to endure harsh conditions. It can operate between temperatures of -25 and +75°C with a humidity level of 10–90% RH, non-condensing.

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

Smart switches

Excel Life Smart by Legrand Australia a range of smart switches and power points that integrate with smart home technology by Netatmo.

Blending in with existing Excel Life installations, the series offers the added convenience of turning any home into a smart home with full control via switch, smart device or voice through a digital assistant.

The Excel Life Wireless Master Switch allows users to turn off lights and appliances from anywhere in the house, while remote access using a smart device lets the user control their whole home remotely. The Wireless Master Switch can also be used to add new switches anywhere and control lights without adding new wiring, making it a suitable retrofit solution.

Legrand Australia P/L
www.legrand.com.au

CASE STUDY

Making home energy solutions from recycled plastic

Home energy solutions made from ocean plastics have recently been unveiled by Schneider Electric.

The Merten range of sockets and switches made from recycled ocean material are also delivered in sustainable packaging, eliminating non-recyclable material, and empowering customers to take one step closer to achieving net zero goals.

Schneider Electric's Merten range includes new models made from polyamide fishing nets collected from the Indian Ocean and the Arabian Sea.

Abandoned or lost fishing equipment makes up around 10% of the plastic waste in the world's oceans. The Merten ocean plastic models contribute to reducing the 640,000 tonnes of fishing nets left in the ocean each year.

Schneider Electric partnered with DSM, a global leader in health, nutrition and bioscience, to transform fishing net waste into high-grade technical plastic that can be used in electrical devices.

DSM collaborates with several local communities in India to recover and collect discarded fishing nets, providing a significant benefit to the local economy and environment.

The abandoned fishing nets are then cut up, cleaned, extruded and inspected for quality before being sent to DSM for processing into Akulon RePurposed compound. The carbon footprint of this new compound is 82% lower than the traditional Nylon 6 used in similar products, reducing the potential impact on global warming, air acidification and photochemical ozone formation in its manufacturing process.

The final material also contains 15% glass fibre to make products more durable, resilient and long-lasting to meet all necessary electrical safety requirements and standards.

"Tackling the global challenge of ocean plastics will require our entire industry to step up and find innovative solutions to drive a circular transformation," said Helen Mets, Executive Vice-President Materials at DSM.

"Through our collaboration with Schneider Electric, we aspire to take a small step towards maintaining healthier marine life, litter-free beaches and cleaner oceans and the initiative is also supporting local livelihoods and creating jobs — all while giving eco-conscious homeowners and residents access to safe and stylish electrical outlets. Together, we can create demand for re-used plastics and help find a second home for discarded recyclable materials."

Schneider Electric
www.se.com/au

REIMAGINING POWER: SMART ELECTRIC GRIDS

A simulation modelled on the Texas power grid could be used to keep the electricity system stable and reliable in the United States.

The study by DOE/Pacific Northwest National Laboratory found that consumers stand to save about 15% on their annual electric bill by partnering with utilities.

In this system, consumers would coordinate with their electric utility operator to dynamically control big energy users, like heat pumps, water heaters and electric vehicle charging stations.

This kind of flexible control over energy supply and use patterns is called "transactive" because it relies on an agreement between consumers and utilities. But a transactive energy system has never been deployed on a large scale, and there are a lot of unknowns. Consequently, the Department of Energy's Office of Electricity called upon the transactive energy experts at Pacific Northwest National Laboratory to study how such a system might work in practice.

Hayden Reeve, a PNNL transactive energy expert and technical advisor, led the team of engineers, economists and programmers who designed and executed the study.

"Because Texas's grid is quite representative of the nation's energy system, it not only enabled the modelling and simulation of transactive concepts but provided a reliable extrapolation of the results and potential economic impacts to the broader United States grid and customers," he said.

The simulation showed that if a transactive energy system were deployed on the Electric Reliability Council of Texas (ERCOT) grid, peak loads would be reduced by 9–15%. That saving could translate to economic benefits of up to $5 billion annually in Texas alone, or up to $50 billion annually if deployed across the entire continental United States. The savings would equal the annual output of 180 coal-fired power plants nationally.

Cutting the brown out

By now, most people have experienced or witnessed how weather extremes or natural disasters can wreak havoc on current power distribution systems. That vulnerability is magnified by reliance on a few centralised power sources and a grid system that sometimes struggles to match supply with demand. Further, decarbonisation of the electric grid will mean that more and more power will come from different kinds of renewable energy sources, like wind and solar. So, avoiding sudden spikes or dips — power brownouts or blackouts — becomes paramount.

The study findings indicate that a transactive energy system would reduce daily load swings by 20–44%. And as more electric vehicles come into use, the study, perhaps counterintuitively, showed that smart vehicle charging stations provide even larger electric peak load reductions because they offer additional flexibility in scheduled charging times and power consumption.

"A smart grid can act as a shock absorber, balancing out mismatches between supply and demand," Reeve said.

"Through our study, we sought to understand just how valuable effective coordination of the electric grid could be to the nation, utilities and customers. Working with commercial building owners and consumers to automatically adjust energy usage represents a practical, win-win step towards the decarbonisation of the electrical, building and transportation sectors without compromising the comfort and safety of participating homes and businesses."

One key component to this strategy is adoption of smart appliances and load controls. These dynamic resources can learn how to consume energy more efficiently, adjusting their use for brief periods to free up electricity for other needs. For example, instead of charging an electric vehicle in the early evening when energy demand and price is high, transactive energy participants would rely on a smart load control to delay charging their vehicle until demand is low and electricity cheaper. This approach not only reduces stress on the existing grid infrastructure, it allows utilities more time to plan for next-generation energy storage and distribution infrastructure that is currently in development.

Transactive energy: a central component

In a transactive energy system, the power grid, homes, commercial buildings, electric appliances and charging stations are in constant contact. Smart devices receive a forecast of energy prices at various times of day and develop a strategy to meet consumer preferences while reducing cost and overall electricity demand. A local retail market in turn coordinates overall demand with the larger wholesale market. All parties negotiate energy procurement and consumption levels, cost, timing and delivery in a dynamic pricing scheme.

While this concept may seem futuristic, it is quite possible to accomplish and is already being deployed in a demonstration project in the city of Spokane's Eco-District. Here, the research team is developing and testing a transactive energy coordination scheme and retail marketplace. The approach also includes the use of PNNL-devised transactive software agents.

An undertaking the size of Texas

Texas's primary power grid (ERCOT) provided the basis for PNNL's analysis. Researchers created highly detailed models that represented the ERCOT power network, including more than 100 power generation sources and 40 different utilities operating on the transmission system. The analysis also included detailed representations of 60,000 homes and businesses, as well as their energy-consuming appliances. Researchers used the models to conduct multiple simulations under various renewable energy generation scenarios. Each simulation demonstrated how the energy system would react to the addition of differing amounts of intermittent power sources, such as wind and solar. The research team also developed a detailed economic model to understand the yearly cost impacts for operators and customers. Finally, they looked at upfront costs associated with labour and software expenses, as well as the costs for buying and installing smart devices in homes and businesses.

Another important goal of the study included evaluating the impact of a new kind of mediator in the grid economy. This entity, called a distribution system operator, would be required to manage a grid that has multiple energy sources owned and operated by distinct entities, all contributing energy to the grid at different times and amounts. In addition, this distribution system operator would negotiate the transactions with customers that allow flexible load control. The goal would be to support efficient and reliable grid operation. The study confirmed the value of establishing entities, such as a distribution system operator, to manage transactive energy.

Overall, the PNNL research showed clear benefits of reimagining how the electric grid could accommodate a future where clean renewable energy is a much bigger contributor and more of our transportation needs depend on ready access to electricity.

"These findings make a strong case for investment in scaled deployments of transactive energy systems," said Christopher Irwin, a program manager for the Office of Electricity, Department of Energy, in its Smart Grid standards and interoperability efforts.

"As the nation moves towards a zero-carbon future, a more adaptable energy system could help accelerate the broader deployment of electric vehicles, solar energy and the conversion of homes and buildings to clean electricity sources."

Smart home automation system

The Clipsal Wiser Smart Home automation system offers affordable, easy to use home automation via a central Wi-Fi hub and a single iOS or Android app.

It also connects across Bluetooth P2P, Zigbee System, Gateway, IR controller and sensors, as well as third party voice controls including Amazon Alexa, Apple's Siri, and Google Assistant.

The use of wireless connectivity removes the need for special cabling to be wired into the home, unlike previous home automation solutions. This opens up the possibility of installing functions as part of a new build or renovation over time and room to room. It also allows for elements to be updated or moved for a homeowner's changing needs.

Through its range of sensors, sockets, switches and IR controllers, the system works behind the scenes allowing appliances and products to be changed as technology evolves. It also uses signal meshing technology allowing components to 'talk' to each other, creating a network that reliably relays instructions from the Wiser Hub throughout the property.

Alongside improving specific occasions, home automation can also streamline daily activities. Lights, blinds, air conditioning and other appliances can be scheduled around waking and sleeping times. The Wiser app enables customisation for different days, allowing for weekend lie-ins or changing shift patterns.

Clipsal - by Schneider Electric

www.se.com/au/en/

LED high mast light fittings

Luminetic HMX Series high mast light fittings are made to light up exterior areas, combining power with focused distribution.

With quality LED chips in a water- and impact-resistant housing (IP66 and IK08 protection), these lights are built tough for Australian conditions.

HMX fittings are available in five wattages: 200, 400, 600, 800 and 1200 W. They come with a 5-year warranty.

The company also offers a complementary lighting design service.

Pacific Automation

www.pacificautomation.com.au

4G/3G compact industrial router

The MTX-Router-EOS, from MTX, is an entry-level router developed for industrial applications. It has a compact, rugged design with accessories for DIN or wall mounting. The unit features dual SIM, 3x Ethernet ports, Wi-Fi, 1x serial port, VPN client and has three antennas included.

The router can be used in many different IoT applications, including signage, kiosks, telemetry, remote sensing, smart grid, security, industrial automation, etc. Remote device management is available with the Cervello STEM IoT platform, which allows for easy configuration and/or monitoring of routers to enable connectivity for volume deployments.

Australis M2M Pty Ltd

australism2m.com.au

STANDARDS AUSTRALIA AMENDS WIRING RULES

This year will be a milestone year for the application of residual current devices in Australia, with changes to the Standards Australia wiring rules that will change the selection of the RCDs used.

Standards Australia Wiring Rules amended

Type AC (alternating current) residual current devices (RCD) have commonly been used in Australia for over 20 years, providing basic protection against electric faults and fire by detecting residual currents with a sinusoidal alternating current waveshape.

However, with the increased adoption of renewables, electronics and emerging technologies (such as variable-speed drives, LED lighting, washing machines, dishwashers and tumble dryers), there has been an increasing presence of earth faults with direct current (DC) waveforms in addition to conventional sinusoidal earth faults. This can cause a dangerous situation as these DC waveforms are unable to be detected by standard Type AC RCDs.

To address this, Standards Australia has implemented Amendment 2 of AS/NZS 3000:2018 Cl 2.6.2.2.2 that now requires the use of RCDs that not only detect sinusoidal alternating current, but also identify residual pulsating direct currents.

Due to the change of requirements, ABB has been able to consolidate its stock profile to match the new market requirements. ABB's extensive range of RCD solutions — Type A, Type F and Type B RCDs — are fully compliant with this new requirement.

"Changes in standards are generally reflective of the product developments and innovations of the electrical industry. The safety regulators and Standards Australia regularly review the international trends to ensure Australia is leading or matching the global safety standards," said Shun Mizuta, Product Marketing Manager – Energy Distribution, Electrification, ABB Australia.

"Higher levels of RCD protection are currently available for specific applications such as solutions requiring high immunity. The new minimum standard requirement of Type A RCDs is an effective move to increase the level of safety for consumers. Further developments in areas such as Arc Fault Detection Devices (AFDD) are likely to be included in standards to further enhance public safety."

What does it mean for the industry?

The Amendment 2 requires that Type AC RCD will no longer be permitted to be sold or installed in Australia after 2 April, 2023. This means the local market needs to complete the necessary product transition during 2022. Changing from Type AC to Type A as the new minimum standard is a functional transition to a higher level of safety as required by the electrical safety regulators. The transition to Type A is not retrospective, so existing installations will not be affected.

ABB has announced it is well prepared to support customers with the migration of Type AC RCDs to Type A, or better, across its product range. The extensive range of ABB solutions include RCCBs and RCBOs in various profiles and ratings to suit every application.

With a consolidated range of RCDs available, ABB is committed to providing the right solutions to protect customers' final subcircuit in accordance with the new requirements.

ABB Australia Pty Ltd
www.abbaustralia.com.au

Profinet cable

The igus chainflex CF898.061.FC Profinet cable offers fast cable harnessing in the field while offering a long service life of up to three years.

To quickly join the connector to the cable, igus has developed FastConnect technology for its highly flexible chainflex Profinet cables. It ensures that the CF898.061.FC can be stripped and fitted with a connector in just a few steps. The inner jacket, shield and outer jacket have been designed so the user only has to set the tool once, then remove the cable, insert the connector and close it, saving 46% of assembly time compared with conventional stripping methods.

The cable is also tested in the company's own 3800 m^2 test laboratory and, in ongoing e-chain testing, has already exceeded the mark of 7.8 million strokes.

Treotham Automation Pty Ltd
www.treotham.com.au

38 kV recloser

The NOJA Power OSM38 recloser now has a DIN C terminal option.

This build option for the 38 kV recloser allows utility engineers to terminate underground cables directly onto the recloser using DIN-C standard elbow connectors. It also allows the OSM38 to be used as an overhead to underground connection point.

The company's DIN-C Terminal options have been available on the 15 and 27 kV OSM reclosers for some time, but increased demand for a 38 kV version has expedited product development.

The addition of DIN-C terminations to the OSM38 recloser allows engineers to upgrade to the NOJA Power RC20 control system, offering more power quality and distributed energy integration features alongside conventional network protection features.

NOJA Power Switchgear Pty Ltd
www.nojapower.com.au

Push buttons, indicator lights and switches

The Siemens SIRIUS ACT portfolio of elegantly designed push buttons, indicator lights and switches offer style, intelligence and physical toughness. Constructed with genuine metal and high-grade plastics, and engineered with smart functions and communication capabilities, these push buttons, indicator lights and switches have been tested for extreme environments to improve reliability for critical operations.

The various communication interfacing options provided by SIRIUS ACT enable simple combinations of push buttons and signalling devices, HMI touch screens and industrial PCs, which means that complex input stations can be set up without extensive wiring and engineering time and effort. Integration into the TIA Portal also enables them to be visually displayed for better harmonisation with the hardware, thus simplifying and speeding up hardware configuration.

A snap-on concept makes the task of installing a unit effortless enough to be done with one hand. This simplicity reduces the risk of incorrect installation.

APS Industrial
www.apsindustrial.com.au

BIG PUSH FOR CLEAN ENERGY LEADING UP TO ELECTION

As Australians turn their attention towards the upcoming federal election, the Clean Energy Council (CEC) has launched its Roadmap for a Renewable Energy Future: Federal Election Policy Recommendations, which urges Australia's political leaders to commit to meeting the country's domestic electricity demand with clean energy by 2030.

"Now is the time to exploit Australia's natural advantages to bring down the cost of electricity for households and businesses and position the country as the innate home of energy-intensive industries in the Asia–Pacific," said Clean Energy Council Chief Executive Kane Thornton.

"Clean energy can create thousands of new jobs, empower consumers, bring economic activity to regional communities, lower power prices and create the smart infrastructure of the future that can cement Australia's place as a global clean energy superpower. More renewable energy investment is crucial for Australia to prepare for the inevitable exit of ageing coal generators over the coming decade."

The Clean Energy Council's nine-point plan consists of the following policy recommendations:

1. Electrify Australia: power the Australian economy and industry with wind, solar, hydro, bioenergy and battery storage.
2. Empower customers and communities to make the switch to clean energy.
3. Build a strong, smart, 21st-century electricity network.
4. Maximise the creation of quality clean energy jobs and a local supply chain.
5. Provide greater support and certainty for coal communities and industry as the phase-out of coal generation accelerates.
6. Modernise Australia's energy market and its governance for the clean energy transformation.
7. Turbo-charge clean energy innovation.
8. Decarbonise Australian industries using clean energy.

"CLEAN ENERGY CAN CREATE THOUSANDS OF NEW JOBS, EMPOWER CONSUMERS, BRING ECONOMIC ACTIVITY TO REGIONAL COMMUNITIES, LOWER POWER PRICES AND CREATE THE SMART INFRASTRUCTURE OF THE FUTURE THAT CAN CEMENT AUSTRALIA'S PLACE AS A GLOBAL CLEAN ENERGY SUPERPOWER."

9. Put Australia on a path to becoming a global clean energy superpower that exports renewable energy to Asia and beyond.

While noting that state and territory governments have become the torchbearers of policy ambition for Australia's clean energy transition in recent years, the CEC emphasised the need for the federal government to take the lead on a strong and coordinated strategy to facilitate private investment in low-cost clean energy.

"Voters will back policy that promotes emissions reduction and, critically, the Australian business community supports an acceleration of Australia's decarbonisation efforts," Thornton said.

"The signals coming from the private sector indicate the federal government's latest policy statements on net zero emissions are not enough. They are looking at short-term 2030 targets to drive immediate investment.

"An electricity grid powered by 100% renewable energy by 2030 will deliver emissions reductions based on 2005 levels of 44.5% — and it comes with the upsides of jobs, investment and growth.

"This is just below the global average of 45% — it's not an ambitious or difficult target — it's the low-hanging fruit.

"This is our golden opportunity that equals billions of dollars' worth of private sector investment, tens of thousands of quality jobs, economic growth and new industries to help sustain regional communities for decades to come."

Clean Energy Council
www.cleanenergycouncil.org.au

Powering a smart city's 5G network

A smart city in the north of the UK will be receiving a new 5G-centric network to accelerate digital services.

Mavenir and BAI Communications (BAI) will be launching the smart city project for Sunderland City Council, powered by Mavenir's MAVedge solution.

BAI Communications will build a new 5G-centric network to increase adoption of transformative digital services for sectors including manufacturing and logistics, education and social care. The initial scope is for the deployment of a city-centre 5G private network which has the potential to evolve and become a neutral host network.

Neutral host models provide coverage and connectivity for smart city initiatives. They enable local councils and authorities to provide smart services and run numerous smart community applications in a more viable and cost-effective manner.

MAVedge comprises Mavenir's Open vRAN and 5G Packet Core solutions to drive the next generation digital transformation of this smart city project, and to provide advanced 5G mobile connectivity to the local Sunderland community. It enables secure private networks to be distributed at the edge and powers a digital marketplace of applications and devices to create an efficient environment for diverse use cases for the enterprise and industry.

"Open RAN is a cost-effective solution which is based on open interfaces and will give us the ability to deploy in a very agile and flexible way," said Brendan O'Reilly, Group Chief Technology Officer at BAI Communications.

The new network will help accelerate transformation within various sectors in Sunderland including:

- Smart homes: addressing health and social care requirements supporting vulnerable individuals living in their own homes, providing access to assistive technologies such as sensors and other IoT enabled devices.
- Digital skills and education: providing enhanced online and remote connectivity and distance learning across primary schools and secondary schools within the local authority.
- Manufacturing and Industry 4.0: improving supply chain agility for the automotive industry, including applications such as self-driving vehicles and autonomous heavy goods vehicles.

"We have long recognised the importance of technology in connecting people and realising opportunities to position Sunderland as a digital frontrunner. This new partnership between BAI Communications and Mavenir presents a fully scalable network architecture to unlock innovation and shape the future of our leading smart city," said Liz St Louis, Assistant Director of Smart Cities at Sunderland City Council.

"Together, we are harnessing the power of technology and digital transformation for the benefit of residents, businesses and visitors to Sunderland. The new network will accelerate the emergence of more smart services including community applications, digital upskilling opportunities and efficiency drives for our advanced manufacturing clusters across the city."

BAI Communications
www.baicommunications.com

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KEY DATA CENTRE TRENDS FOR 2022

Data centres could accelerate moves to mitigate the climate crisis.

A list of the key data centre trends to watch in 2022 has been released by Vertiv, with experts predicting long-held conversations around efficiency and utilisation in the data centre will evolve to reflect a more comprehensive and aggressive focus on sustainability.

This movement recognises the urgency of the climate crisis, the relationship between resource availability and rising costs, and shifting political winds around the world.

"As we move into 2022, data centre operators and suppliers will actively pursue strategies that can make a real difference in addressing the climate crisis," said Vertiv CEO Rob Johnson.

"For our part, we continue to focus on energy efficiency across our portfolio, as well as alternative and renewable energy technologies and zero-carbon energy sources, to prioritise water-free cooling technologies, and to partner with research leaders and our customers to focus on impactful sustainability efforts."

The actions data centre decision-makers take on these fronts will have a profound impact on the digital economy in 2022 and beyond. The urgency of these challenges is reflected in the 2022 trends identified by Vertiv's experts. Those trends are as follows.

Data centres tackle sustainability and the climate crisis

The data centre industry has taken steps toward more climate-friendly practices in recent years, but operators will join the climate effort more purposefully in 2022. On the operational front, Vertiv experts predict some organisations will embrace sustainable energy strategies that utilise a digital solution that matches energy use with 100% renewable energy and ultimately operates on 24/7 sustainable energy. Such hybrid distributed energy systems can provide both AC and DC power, which adds options to improve efficiencies and eventually allows data centres to operate carbon-free. Fuel cells, renewable assets and long-duration energy storage systems, including battery energy storage systems (BESS) and lithium-ion batteries, all will play a vital role in providing sustainable, resilient and reliable outcomes. Thermal systems that use zero water are in demand, and we will see refrigerants with high global warming potential (GWP) phased down in favour of low-GWP refrigerants.

More immediately, extreme weather events related to climate change will influence decisions around where and how to build

new data centres and telecommunications networks. Other factors, including the reliability and affordability of the grid, regional temperatures, availability of water and renewable and locally generated sustainable energy, and regulations that ration utility power and limit the amount of power afforded to data centres, play a part in the decision-making as well.

These extreme weather events will drive more robust infrastructure systems across the information and communications technology (ICT) space which will need to be carefully aligned with sustainability goals. In 2022, data centre and telecom operators will wrestle with these issues — and ever-present latency questions — and will drive a need for solutions that can address all of these challenges.

Artificial intelligence gets real

As today's networks get more complex and more distributed, and the augmented and virtual reality demands of the metaverse become more prominent, the need for real-time computing and decision-making becomes more critical. This real-time need is sensitive to latencies, and under the increasingly common hybrid model of enterprise, public and private clouds, colocation and edge, full-time manual management is impractical, if not impossible. Artificial intelligence (AI) and machine learning will be critical to optimising the performance of these networks.

It will take focus and time to collect the right data, build the right models and train the network platform to make the right decisions. However, the programming tools have become simplified enough that data scientists are able to point computing resources at a problem without having to be experts in programming or hardware. The availability of AI hardware from established vendors, cloud options for the same, a simplified toolchain and an educational focus on data science has put AI in play for even smaller companies. It all adds up to accelerating AI adoption in 2022.

As with every technological advance, there are ripple effects. The increase in AI will unavoidably increase computing and heat densities and, by extension, accelerate the adoption of liquid cooling. Among other challenges, lowering the barrier to entry places a premium on choosing the right vendors, platforms and systems to trust.

The post-pandemic data centre takes shape

Some 2.9 GW worth of new data centre construction is underway globally — up from 1.6 GW in 2020. Those data centres will be the first built specifically to meet the needs of a post-COVID world. More activity will be focused at the edge, where VMware projects a dramatic shift in workload distribution — from 5% currently to 30% over the next five years. Availability will remain the top priority, even at the edge, but lower latency is a rising need to support healthy buildings, smart cities, distributed energy resources and 5G. 2022 will see increased investment in the edge to support this new normal (remote work, increased reliance on e-commerce and telehealth, video streaming) and the continuing rollout of 5G.

Drive toward integration

Various data centre equipment providers have been embracing integrated systems that allow for modular capacity additions for years, with integrated racks and rows among today's most popular data centre offerings. In 2022, we'll see the next step in integration as data centres work with providers to better integrate larger systems — all components of the power infrastructure, for example — and deliver seamless interoperability.

The benefits of integration as a concept are well known — reduced construction and deployment costs, flexible capacity management — and applying the same approach across larger systems delivers speed. Rack-based power solutions are early accelerators of integration momentum.

"With warming occurring faster than projected and extreme weather events increasing in frequency and severity, there's now an urgent need for society, government and industry to address climate change. Business heads can lead the way toward a decarbonised future, and technology will back the race," said Robert Linsdell, Managing Director Australia and New Zealand at Vertiv.

"While there are plenty of game changers coming down the pipe, data centres don't need to wait for emerging technologies to go greener. From renewable energy sources to water-free cooling technologies, businesses are primed to reduce emissions through the cogs that power our data-hungry lives."

Vertiv Australia Pty Ltd
www.vertiv.com/en-asia/

Single board computer

The iBase IBR215 2.5″ single board computer has an NXP ARM Cortex-A53 i.MX 8M Plus Quad 1.6 GHz Processor.

Measuring 105 x 72 mm in a compact footprint, the SBC offers good computing performance, advanced multimedia, flexible connectivity and a variety of interfaces, making it suitable for industrial automation, smart homes and buildings, smart cities and factories, retail environments, machine learning and industrial IoT applications.

The IBR215 features multiple display interface (HDMI and dual-channel LVDS), a 5G-compatible M.2 3052 socket, 3GB LPDDR4 system memory, up to 64 GB eMMC flash memory, external I/O including one HDMI 2.0a, two USB 3.0, two GbE RJ45, one USB OTG and an SD socket, as well as internal headers for two I2C and DC power. Three 2 x 20 headers onboard connect communication and GPIO signals to the IBR215-IO expansion board to provide interfaces for an M.2 E-key socket, a mPCIe socket, one RS232/422/485 port, two USB 3.0, dual-channel LVDS with backlight control, two CAN bus and two MIPI camera serial interface.

The IBR215 also has a wide operating temperature range of -40~85°C when built with a heat sink or housing with efficient heat dissipation.

Backplane Systems Technology Pty Ltd

www.backplane.com.au

Finger-proof crimp contacts

The ILME CX7MA..P crimp contacts offer a finger-proof construction specifically designed to eliminate potential high-voltage hazards when handling connectors still under load or energised.

The silver-plated 70 A male contacts are available in four sizes, from 6 to 25 mm2, and have a protective insulating cap, which prevents any accidental access to the uncoupled connector during assembly or regular maintenance activities.

Used with the CX 02 7M MIXO modular insert, it becomes a suitable solution for wind power applications using large capacitors, as well as battery storage systems, which can benefit from the combination of the high current carrying capacity and the slim design of the connector, helping to ensure a safe and robust user-proof connection.

Treotham Automation Pty Ltd

www.treotham.com.au

5G industrial gateway

The Inseego Wavemaker PRO 5G S2000e industrial gateway is built to deliver sustained, multi-gigabit per second data throughput.

Combining high-performance 5G with advanced 4G LTE capabilities, it has dual SIMs for flexibility, reliability and business continuity.

With enterprise-grade hardware features, cloud-based remote device management and advanced security capabilities, the gateway is designed for 24/7 business continuity and to safeguard critical connections.

In addition to supporting fixed installations, the gateway is suitable for mobile installations, providing 5G/LTE and GPS for vehicular area networks.

It offers simultaneous 4 x 4 MIMO LTE and 5G connectivity, enabling faster throughput and better coverage, even when falling back to LTE. Advanced thermal management enables the gateway to provide multi-gigabit 5G data rates continuously, without throttling the available sub-6 bandwidth or falling back to LTE due to internal temperatures. This is especially important for industrial environments with extreme temperatures.

The gateway is suitable for manufacturing equipment — it supports real-time monitoring and control systems in factories and other facilities, with high throughput, low latency and fewer wiring hassles. It is also suited to energy and utility enclosures, particularly remote installations where wireline will not work. This could include remote pump stations or meter readers.

Ctrack

www.ctrack.com.au

TOTAL FACILITIES (TFX) RETURNS TO MELBOURNE

What: Total Facilities Expo (TFX)
When: 10–12 May
Where: Melbourne Convention and Exhibition Centre

Register: totalfacilities.com.au

Total Facilities (TFX) is Australia's dedicated event for facilities managers. TFX will be part of a week of events held for professionals across the built environment.

Covering industries ranging from planning and construction to technology and facilities management, DesignBUILD, Total Facilities (TFX), the Be Summit and Digital Construction Week will join forces to create a unique built environment event for Melbourne.

TFX offers the latest products, technology and information for best-practice infrastructure and facilities management. It is dedicated to helping create better and smarter spaces, cultures and insights. Exhibitors include Dulux, Zip Water, Ecolab, ABB Australia, Shred-X and Nespresso Professional.

Visitors will be able to learn about creating smarter and more efficient buildings over three days of free presentations at the Smart Building Theatre, sponsored by Rapid Test and featuring a line-up of facility management industry experts. The Facilities Management Association has put together a program that includes topics such as, 'Improving Building Compliance & Occupant Wellbeing', 'Unlocking the value in adoption of AS/ISO 41001' and 'Practical approaches to getting started on the journey to net zero emissions'.

Diversified Communications Australia
www.divcom.net.au

Q&A WITH MARK ANNING: HOW SHOULD INDUSTRY NAVIGATE AS/NZ61439?

In this interview, Mark Anning, General Manager, Eaton Corporation, Australia & New Zealand, takes an in-depth look at what the updated standard will mean for businesses.

What does the AS/NZS 61439 standard mean for the industry in both the long and short term?

Overall, the updates from AS/NZS 6139 will introduce a positive step towards safety mandates, including fault containment and type-tested assembly, ensuring longevity in operator, equipment and customer safety.

It is clear that the new standard will impact manufacturers, assemblers and end users involved in all types of switchboard assemblies — from distribution boards up to 250 amps, right through to main switchboards above 250 amps.

Before the introduction of the industry standard, switchboards only required a simple calculation to be deemed safe and compliant, so the change to a new criterion for compliance is an evolution in the industry.

In the short term, there will be an adjustment for all the switchboard builders, regulators and specifiers in Australia and New Zealand to implement the changes and understand what it means to be compliant.

In the long term, the standard will set the bar for future revisions and the industry will gravitate towards systems developed and tested by the major manufacturers in the electrical industry. Another long-term benefit for the industry is that the end user and the consumer will see uniformity across all the testing and performance compliance amongst available systems offered in the market.

How can businesses best navigate the updated standard?

Switchboard builders and manufacturers have been, and will continue, on a learning journey whilst adoption of the AS/NZS 61439 standard and systems is still new. The first step I recommend is getting well-versed with the new standard, including the updated verification and testing requirements.

Furthermore, businesses should look to adopt a verified switchboard system from a manufacturer on the market offering training and certification who is able to provide full-time support and assist in the transition to AS/NZS 61439 compliance.

How will the new standard change future innovations?

The main aim of AS/NZS 61439 is to bring consistency across testing, performance and compliance to all systems offered in the market, so for now I don't see any big innovations on the horizon as a direct impact of the standard.

If we look back at how switchboards have evolved in Australia and New Zealand, the initial option for switchboard builders was to manufacture their own. With the introduction of compliance mandates moving forward they will need to adhere to the standards even with customised solutions.

This will trigger a shift towards modular fully type-tested solutions, like the one that Eaton offers with the xEnergy. Modular systems have been prevalent in other markets, like Europe, for a much longer time and have proved to be great solutions so it's a promising direction for the Australian and New Zealand market.

Are there any additional liabilities of which businesses need to be aware?

Compared to the practices of the past there is a new responsibility of being the original manufacturer or 'owner' of the system to ensure that if you're continuing with a customised solution, all the relevant tests have been done.

Businesses currently using custom systems will need to understand there are costs involved to update their verification and meet compliance. Costs associated with custom solutions include new tests, inventory and materials, shelving or floor space, machinery, and staff or labour costs.

If adopting a verified manufacturer's switchboard system, none of these costs associated with custom systems apply. This is because the responsibility of the design and its compliances lies with the manufacturer. Meaning if these systems are designed and assembled in accordance with the rules and guidelines of the AS/NZS 61439 standard, then design verification is guaranteed.

What industries are best suited for the new standard, and why?

The new standard aims for uniformity and consistency amongst all switchboards manufactured; therefore, it benefits all industries and applications. That includes commercial buildings and industrial applications as well as hospitals and data centres.

It's a large undertaking going through the testing, and a timely and expensive process too.

How has Eaton responded to the new standard?

With over 100 years of industry knowledge and experience, Eaton has always been ahead of the standard through vigorous testing, product research and development. In Australia and New Zealand, Eaton has invested in stock and dedicated engineering support personnel to assist partners with design, engineering and construction of compliant switchboards.

This, in conjunction with our Partner Program, differentiates Eaton's approach in the market and adds another layer of confidence in the end user regarding the integrity of the system. Eaton also plays a role in education and training via webinars, consultant and industry group presentations, roadshows and partner training programs to educate and inform the market on the changes and responsibilities of the new standard.

Our upcoming roadshow is dedicated to the new Eaton xEnergy solution and, more broadly, all products which offer an end-to-end solution for AS/NZS 61439 compliance, and will be an educational event to inform the market on the suite of products to support compliance with the standard.

How is Eaton helping to drive the industry forward?

Eaton is providing a vehicle forward by offering a complete solution with a class-leading switchboard system, including switchgear and distribution boards backed by full-time support. Eaton also sits on the standards committee contributing to driving change in the industry's future.

An area of particular interest for Eaton is the transition to a more sustainable, low-carbon future offering renewable energy solutions as well as the technology to monitor, manage and optimise energy usage. In line with their long-standing reputation, Eaton is at the forefront of the energy products of the future working towards megatrends and digitisation.

Eaton Corporation
www.powerware.com

70% OF ENERGY SUPPLIERS WORKING TOWARDS NET ZERO

A new survey shows that Australian energy suppliers are actively engaged in implementing strategies to help achieve net zero goals.

Publicis Sapient's Next Stop Net Zero global benchmarking report surveyed 375 CIOs, CDOs, CTOs and digital decision-makers at energy suppliers across Australia, France, Germany, Switzerland, the UK and the UAE to gauge their efforts in realising net zero emissions by 2050.

The report indicates clear intent from Australian energy suppliers to use digital business transformation to drive net zero outcomes, as well as strong influence from government, energy consumers and investors. 78% of Australian energy suppliers surveyed cited increased pressure from customers to become more environmentally sustainable as a key challenge during the last five years — the highest rate across all regions surveyed. In addition, 88% of Australian respondents expressed that the net zero agenda presented them with an opportunity to transform their business more broadly.

"Energy suppliers will play a central role in realising Australia's vision to achieve net zero by 2050. Embracing new technology and digital business transformation will be pivotal in propelling energy suppliers and the broader Australian economy in their journeys towards net zero outcomes. The Next Stop: Net Zero findings reiterate the significance of digital business transformation in enabling net zero outcomes while also ensuring safe, reliable and affordable energy for consumers," said David Leung, Senior Manager Strategy & Consulting, Publicis Sapient.

According to the report, Australian energy suppliers are more concerned than their global peers about increased competition from 'digital native' challengers and how they should respond. 44% of respondents expressed that the challengers were an extremely influential motivator in driving their corporate digital transformation agenda (compared to an average of 28% across other regions).

"Relative to other parts of the world, there is strong central focus, consumer appetite and supportive technological conditions for new digital energy business and market models in Australia. This means incumbent businesses need to think-through and action competitive responses as challengers rapidly approach and consume new value pools. The net zero mission has become a powerful mantra for driving digital transformation strategies, providing an opportunity for energy suppliers to transform themselves from the inside out. If energy suppliers are to realise their net zero ambitions, a significant re-evaluation of their digital strategies needs to take place," he added.

40 CELEBRATING YEARS
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