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AUGUST 2020
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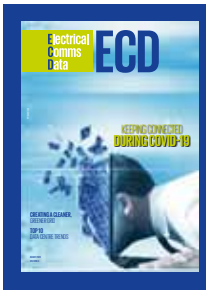

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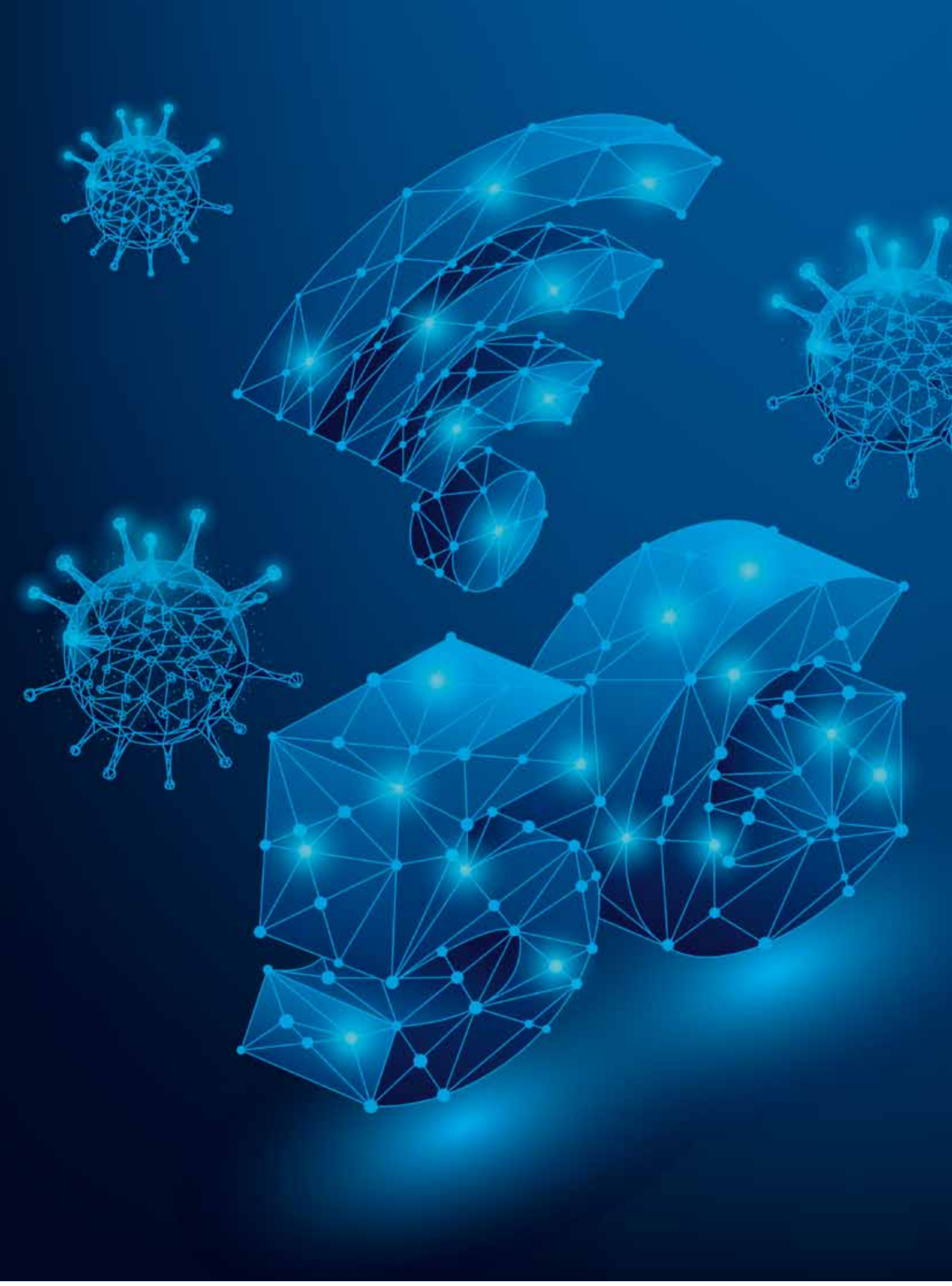
FROM THE EDITOR

Finding ways to keep connected has never been so important, as Victoria remains under strict lockdown measures and a so-called "second wave" of COVID-19 threatens other parts of Australia. This issue of *ECD* takes a look at the effect that the global coronavirus pandemic has had on the rollout of 5G, as well its influence on the online activities of people around the world.

It is clear that we have become more reliant than ever on internet and telecommunications networks, with demand for bandwidth on the rise. In fact, research from Limelight Networks shows that global consumers are now engaging with the medium of online video for an average of four hours and three minutes per day. Meanwhile, Telstra reported that social distancing measures had placed a greater demand on its network, with the expectation that such demand will continue and increase over time. Given that many governments around the world are now investing in an attempt to stave off financial recession, we could soon see a move to provide more funding for 5G networks to ensure better coverage into the future.

Following on with the theme of upgrading infrastructure, this issue explores how electricity networks could be improved to better accommodate renewables. According to a report from the International Panel on Climate Change, if renewable energy is to be used to its full potential, then electrical infrastructure must be updated to accommodate the increase in supply and transport power to where it is needed. The use of composites can increase the current capacity of the grid, transporting renewable energy efficiently from generation to end use — and providing a more effective power supply.

Amy Steed – Editor
ecd@wfmedia.com.au



KEEPING CONNECTED DURING COVID-19

Amy Steed

The global COVID-19 pandemic has seen a marked shift in the way individuals and organisations are connecting to one another.

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While lockdowns and social restrictions have been in place, people have become more reliant than ever on internet and telecommunications networks.

As demand for bandwidth continues to rise, many industries are undergoing a digital transformation and the race to roll out the most advanced 5G technology has gathered momentum.

How 5G is reshaping industries

While 5G has already penetrated a range of industries and markets around the world, its use has mainly been limited to smaller, more densely populated areas. However, its abilities and applications have proved incredibly useful for a range of industries. For instance, 5G with low latency and greater bandwidth accelerates the rate of data download, enabling the of use real-time data within industrial operations. Images and data can be downloaded much faster with 5G integrated IIoT devices. As a result, data can be easily shared remotely.

High-speed data sharing is achieved using 5G integrated cloud manufacturing solutions. In a 5G network, more data can be downloaded, uploaded and shared among the machines and between the machines and central cloud platform.

5G also increases the pace of robots by increasing the rate of wireless control or programming transfer between robots and the IIoT-based controller. It boosts the processing time and data throughput for robots, enabling robots to be more easily connected to workers and machines. The benefits of using 5G robots were highlighted in Wuhan, China, where the initial outbreak of COVID-19 began. Huawei installed a 5G network on one of the specialist hospitals, with 5G-enabled robots utilised in routine medical care. In order to protect humans from contracting and spreading the virus — as well as give exhausted, overworked medical staff a break from their duties — these robots were able to carry out temperature checks with 5G connected thermometers, provide food and drinks and deliver medications to patients. Vital signs such as heart rate and


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> THE PANDEMIC HAS PUSHED THE BOUNDS OF ONLINE VIDEO. APPLICATIONS SUCH AS REMOTE COLLABORATION, E-LEARNING AND TELEHEALTH HAVE BEEN WIDELY AVAILABLE FOR SOME TIME NOW; BUT TODAY, THEY'RE ESSENTIAL TO CONTINUING LIFE IN QUARANTINE.

blood oxygen levels were monitored through smart devices worn by patients at the hospital, and robots cleaned and disinfected hospital floors.

Could widespread 5G adoption be delayed by the pandemic?

Research conducted by GSMA Intelligence found that although 80–95% of adults in most high- and middle-income countries own smartphones, a far smaller percentage had any immediate plans to upgrade to 5G networks. In fact, only 30–40% of the US, European and Australian markets indicated that they intended to upgrade to a 5G smartphone in the foreseeable future.

"The device ecosystem will be critical in shaping the trajectory of 5G adoption," said Peter Jarich, Head of GSMA Intelligence.

"However, it's a mistake to believe that consumers in every market will look at 5G upgrades in the same way. Operators and device manufacturers will need to understand consumer demand on a granular level if they hope to make the most of the 5G opportunity."

Some market analysts have suggested that social isolation will see a marked uptake in 5G connections, with rollouts fast-tracked due to increased demand for connectivity. Others believe that these rollouts will be delayed or halted due to the financial hit that many businesses have taken as a consequence of the pandemic.

Increased demand for bandwidth

One thing is certain — COVID-19 has led to a sharp increase in the online activities of people within Australia and around the world. According to a report from Limelight Networks (based on responses from 5000 consumers around the world), global consumers are now engaging with the medium of online video for an average of four hours and three minutes per day. The 'How Video is Changing the World' report highlights the new ways online video supports daily activities during and after the pandemic.

With many traditional sports leagues placed on hold due to social distancing restrictions, nearly one-third (31%) of global consumers had their first e-sports experience during the pandemic. With other live events cancelled, almost half (44%) of respondents attended their first virtual concert. Exercising is also going virtual, with many athletic facilities closed. In fact, 31% have participated in an online fitness class and another 24% plan to do so within the next six months.

Remote work and professional development have also become reliant on online video. As the pandemic has forced many people to work remotely, 79% agree that online video equips them to maintain daily activities. One-third (33%) are working from home for the first time and say online video helps them stay connected to colleagues (24%) and work more efficiently (36%). More than half (58%) have or plan to use online video for professional development or to learn a new skill. Most people (83%) believe video-based learning will continue in the post-COVID world.

Evidently, internet connectivity and better data transmission has become essential for millions of people around the world, as it is allowing work to continue without the need to go into the physical workplace. Despite the fact that most office workers have had the capacity to work from home since before the pandemic arrived, 5G can provide a far better experience. It improves connectivity for virtual meetings and possesses higher network capacities, making it an important tool in simply keeping up with new traffic demands.

"The pandemic has pushed the bounds of online video. Applications such as remote collaboration, e-learning and telehealth have been widely available for some time now; but today, they're essential to continuing life in quarantine," said Mike Milligan, Senior Director of Product and Solution Marketing at Limelight Networks.

"Many people turned to online video to connect with others and maintain daily activities during the pandemic, but it won't stop once quarantine is over. Our report emphasises that online video will remain an important part of our lives in the new normal."

Networks strained by increased volume of phone calls

According to Telstra, social distancing has led to an increased demand on its network, and the company expects this to continue. On 24 March, information on Telstra's website stated that "overall mobile call volumes on certain routes and geographies are up by more than 50%. Specific numbers to government call centres are experiencing three times the call volumes compared to last week, and over 20 times the normal call volume. As a result, we're seeing congestion impacting a small proportion (3–4%) of calls on our mobile network, with most of the congestion being driven by the high number of calls to government 13 and 1800 numbers." With Victoria heading back into lockdown at the time of writing, the telco has also offered to provide its customers with additional data to help see them through this quarantine period.

Given that COVID-19 appears to be sticking around for a while yet, it would seem likely that the world will rely on improved connectivity and demand for faster, better networks will continue into the future. As governments invest to avoid a major economic recession, it is logical that many will move to fund 5G networks and ensure more coverage so that citizens, businesses and government bodies can remain better connected to one another.

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BMD MOVES TO HYBRID CLOUD DATA STORAGE

BMD has shifted away from manual tape-based storage and has made the transition to hybrid cloud.

The engineering design, construction and land development contractor has worked with Rubrik to make the change, giving it more time for its strategic projects.

"Our previous tape library presented a number of challenges for our team. We needed a new system to allow us to think and act more strategically on our data," said James Cuneo, BMD Technical Systems Engineer.

BMD worked directly with Rubrik to replace the legacy tape system with its Radar, Polaris, Live Mount and Edge services, which have dramatically simplified how the company manages its data. Data is now backed up digitally and automatically at a rate of around six gigabits per second, drastically reducing the manual six- to seven-hour process to now less than an hour.

Cuneo said that while the productivity gains have been immense, BMD's ability to identify exact point-in-time changes in data have had unexpected benefits across the business.

"We had a timely matter where we needed to identify the exact time a transaction was made," he said.

"Rubrik's Live Mount was able to load 1000 previous versions of our CRM software to see the split second it went through."

Further, the simplicity and cloud-native nature of the environment has helped accelerate the company's transition to hybrid cloud. In total, the Rubrik environment is now protecting the data of 272 virtual machines (VMs), 871 SQL databases, 1185 applications and workloads, 1087 Microsoft Office 365 mailboxes and seven remote sites across Australia.

"Businesses are taking on data at a much higher rate now, much of which is being created and stored off-site as businesses operate between the office and remotely," said Jamie Humphrey, Managing Director for Rubrik Australia and New Zealand.

"BMD is a perfect example of a company that has regained control of its data, at a time when its technology resources are needed more than ever. This will empower the company to focus on its core business — building and developing the infrastructure our nation relies on and supporting local communities through job creation."

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ICN10 DATA CENTRE UNDERWAY IN SOUTH KOREA

A global cloud- and carrier-neutral data centre is now under construction in South Korea.

Digital Seoul 1 (ICN10), the first carrier-neutral facility in Korea, will be built on a 22,000 square foot land parcel within the Sangam Digital Media City in north-west Seoul, a newly developed urban planning zone focused on technology and media companies, designed to promote South Korea's digital economy.

The move marks a significant expansion of PlatformDIGITAL across the Asia Pacific, which will enable customers to rapidly scale digital transformation by deploying critical infrastructure with a global data centre provider.

ICN10 is designed to accommodate 12 megawatts of information technology load. The building will encompass over 162,000 square feet, spanning 12 levels. It will provide seamless connectivity, with a vibrant community of domestic and internal bandwidth and data service providers, internet transit and multiple internet access services. The facility is scheduled to be ready for customers in the fourth quarter of 2021.

"Our investment in South Korea is an important milestone on our global platform roadmap, adding coverage, capacity and connectivity capabilities to enable our customers' digital transformation strategies while demonstrating our commitment to supporting customers' future growth on PlatformDIGITAL," said Digital Realty Chief Executive Officer A William Stein.

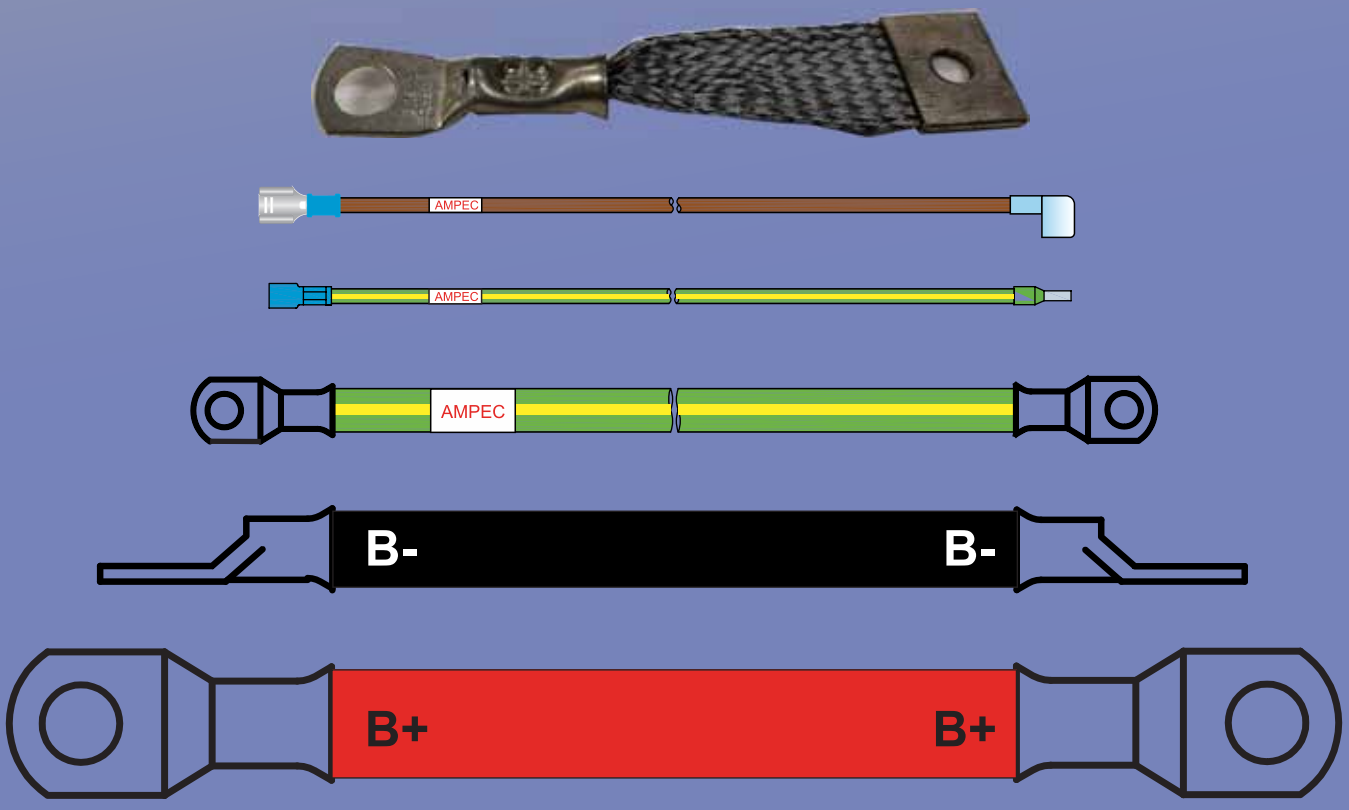
"The current pandemic has accelerated the pace of digital transformation and adoption of cloud services across the world. Customers in the Asia Pacific region are set to gain from our new ICN10 facility, as they ramp up their own digitalisation efforts."

"South Korea is one of the key digital hubs in the APAC region with a major focus on digital technology and solutions," said Mark Smith, Managing Director APAC for Digital Realty.

"Applications such as big data, artificial intelligence, 5G mobile services and the Internet of Things are already gaining momentum. South Korea is also one of the fasting growing data centre markets in the region and a strategic market for us to enter as the first global provider to build from the ground up."

Digital Realty is one of the world's largest owners, developers and operators of highly reliable data centre facilities. The new Seoul development will strengthen Digital Realty's presence within the Asia Pacific region, where the company currently operates a network of data centres located in Tokyo, Osaka, Hong Kong, Singapore, Sydney and Melbourne.

Wiring Harness Solutions



ampec TECHNOLOGIES

Ampec Technologies Pty Ltd

Tel: 02 8741 5000 Email: sales@ampec.com.au

ELECTRICAL SAFETY BUDGET FOR HOME RENOVATIONS

Those who qualify for the federal government's HomeBuilder stimulus are being urged to put aside 10% of their budget for electrical upgrades and safety.

The government's stimulus measures have been welcomed by Master Electricians Australia; however, CEO Malcolm Richards has urged homeowners to factor safety and reducing energy bills into their plans.

"Applicants who are eligible for the federal government's HomeBuilder package should set aside 10% of their renovation budget for electrical safety," Richards said.

"It's critical an opportunity such as this is not wasted on features that sacrifice safety or energy efficiency.

"Many older houses have old wiring and switchboards that present potential electrical safety risks. Setting aside a small portion of a renovation budget more than pays for itself if it safeguards a homeowner from electrical tragedy."

Owner-occupiers earning up to $125,000 a year for individuals and $200,000 for couples are now eligible for a federal government grant of $25,000 to spend on renovations costing at least $150,000. Work on the renovation must begin between now and the end of the year.

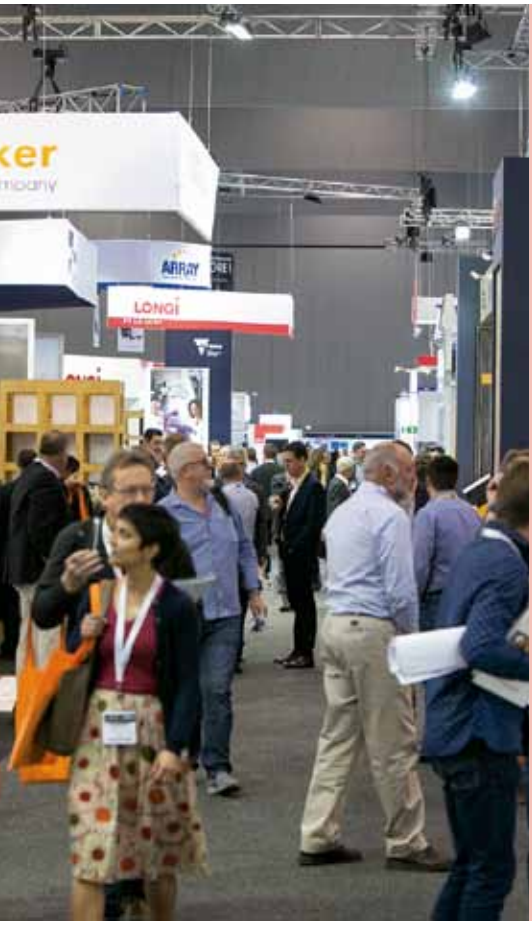
Richards said any measure that saved construction industry businesses and jobs was welcome but urged homeowners not to neglect the need to upgrade electrical safety and energy saving features.

"Installing safety switches on every circuit should be an essential component on any substantial renovation,'' he said.

"A safety switch can cut the power to a circuit in less than one-hundredth of a second — faster than the critical phase of a heartbeat.''

Homeowners should also consider installing a smart home package, including updating to a smart meter and other features such as in-home displays that give a visual indication of how much energy the home is using and what it is costing at any given time.

"A qualified Master Electrician can also advise homeowners on the best energy efficiency package for their home when considering upgrading switches, lighting and wiring,'' Richards said.



ALL-ENERGY AUSTRALIA RETURNS TO MELBOURNE

The future of clean energy in Australia remains promising in spite of these unprecedented times. The renewable energy sector has boosted the country's economy during the past few years and is equipped to assist the national economic recovery effort from COVID-19. With an extensive pipeline of renewable energy projects and strong demand for rooftop solar and battery storage, the industry has the potential to create thousands of new jobs, lower energy costs and attract investment into the Australian economy.

For this reason, All-Energy Australia is gearing up for its event in Melbourne to support the industry in accelerating the country's transition to a clean, reliable energy system of the future. This free-to-attend exhibition and conference, organised in partnership with the Clean Energy Council, will enable renewable energy professionals to gain exclusive access to the latest technologies and trends, and discuss the opportunities and challenges in the sector.

"The event takes place at a crucial time in our country where Australia's clean energy transition is more important than ever. All-Energy Australia provides a platform for the industry to connect visitors with leading suppliers at our exhibition floor and drive conversations about the future of renewables at our multi-stream conference," said Tim Rusbridge, Exhibition Director at All-Energy Australia.

The health and safety of exhibitors, visitors and staff is All-Energy Australia's number one priority. The organisers of the event are actively monitoring the COVID-19 developments and working with the venue and relevant authorities to ensure the event will have the highest health and safety protocols in place.

All-Energy Australia will be held at the Melbourne Convention and Exhibition Centre. Free registration is available at www.all-energy.com.au.

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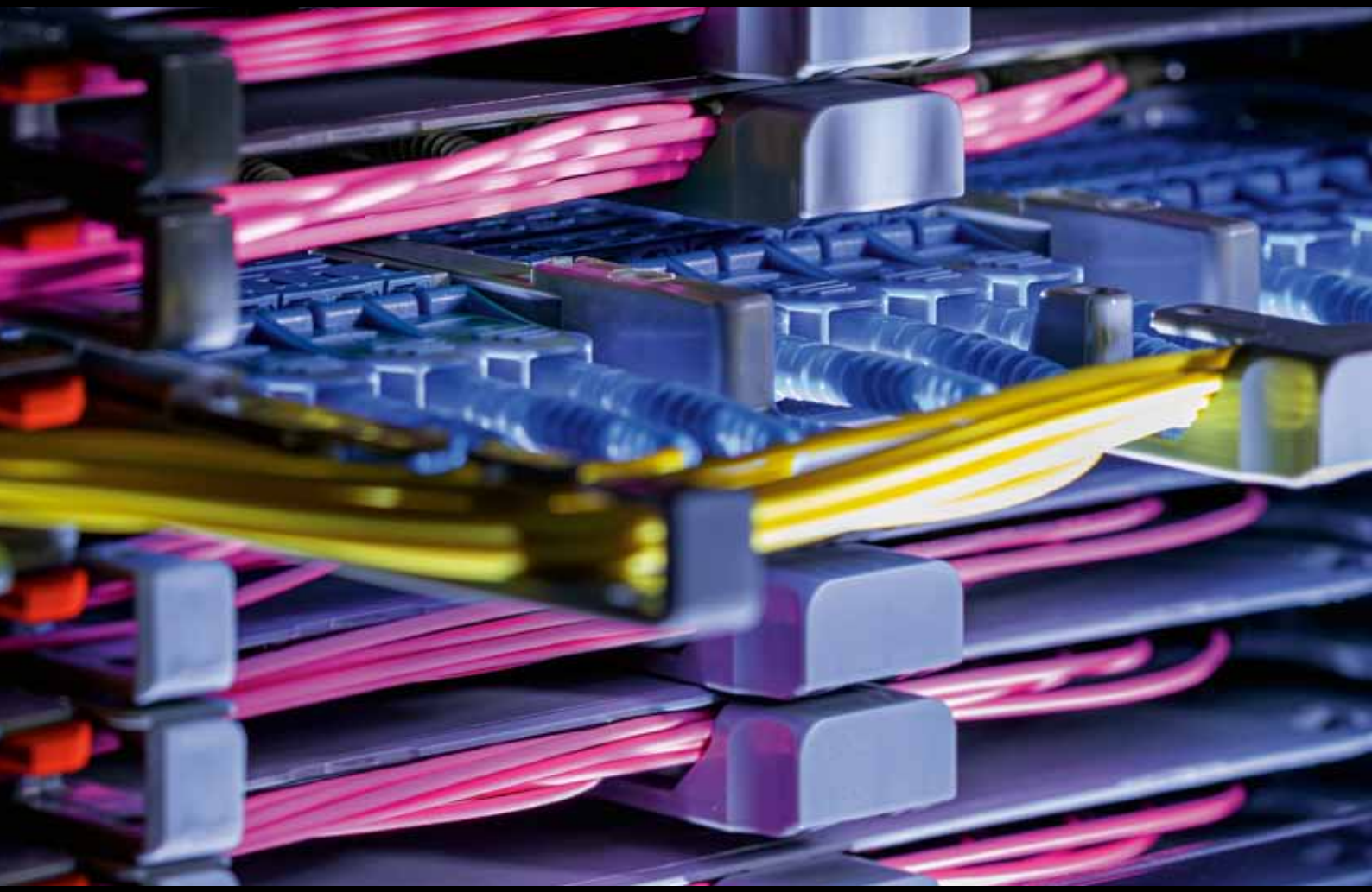
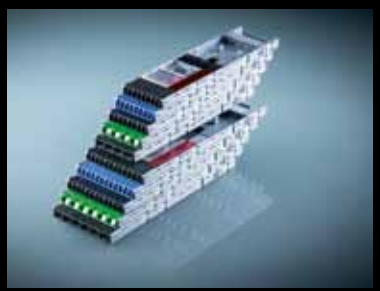
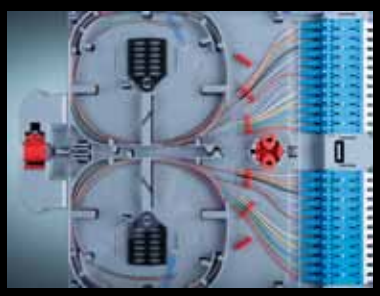


R&M is extending its range of high density distributors and infrastructure management systems for data centers with Netscale 72 and inteliPhy net.





Netscale 72

- the only high density platform to allow for up 144F splicing.
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- facilitates fast migration to new network generations.
- used to create large spine-leaf network architectures in cloud data centers.
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- use to plan and control migrations, workflows, maintenance and patch jobs.

For more information go to https://sites.rdm.com/netscale72

R&M

www.rdm.com/aus_en

Phase 3 pole RCBO

The CBI Electric SE4 3 Phase 3 pole RCBO has recently been released. It is 54 mm wide, available in C curve and D curve with amp ratings from 6–63 A. It is a 10 kA product and is din mountable for either chassis fixing or standalone in 3 phase applications.

Switching arrangements and the wiring rules surrounding them are made simpler with the different switching directions available. Users can simply choose between the SE7 and the SE4.

Another advantage to the product is that is saves valuable pole space in switchboards or distribution boards. The 3 Phase 3 pole RCBOs will fit onto the CBI Advantage range of distribution board chassis for a full 6 kA or 10 kA application.

CBI Electric Australia Pty Ltd
www.cbi-electric.com.au

Coating thickness tester

The DeFelsko PosiTector 6000 is a ferrous and non-ferrous coating thickness tester with a storage capacity of up to 100,000 readings, available to rent from TechRentals. It supports simple functionality with enhanced one-handed menu navigation, more than 60 readings/min and a flashing display designed for noisy environments.

This unit continually displays and updates average, standard deviation, min/max thickness and the number of readings while measuring. The measurement range is from 0 to 1500 μm or 0 to 60 mils (selectable). Tolerance is ± 1 μm $+1\%$ of reading for 0–50 μm and ± 2 μm $+1\%$ greater than 50 μm.

The PosiTector 6000 has built-in temperature compensation that ensures measurement accuracy. The Hi-Res mode increases displayed resolution for use on applications that require greater precision. This unit conforms to national and international standards including ISO and ASTM. It is supplied with an external probe, calibration standards and a carry pouch.

TechRentals
www.techrentals.com.au

Mobile machine monitoring

Machine builders are constantly looking for new ways to differentiate themselves and to bring additional value to customers. The ability to quickly check machine status and performance is becoming more and more important in the light of digitalisation.

For users of Ewon Flexy products by HMS Networks, eCatcher Mobile KPIs brings live machine KPIs directly to their mobile devices. The solution is based upon the secure eCatcher software, which establishes remote connections to Ewon-connected machines via the cloud service Talk2M. By using a mobile device with the eCatcher Mobile app for iOS and Android installed, users get a live look into their machines' status and performance from anywhere in the world.

HMS has now updated the mobile version for iOS and Android — eCatcher Mobile — to enable presentation of live KPIs from any machine equipped with an Ewon Flexy. Ewon users will feel at home since this feature is already available in the free browser-based web portal M2Web. Users start by selecting up to six KPIs from the list of defined machine variables inside each machine-connected Ewon Flexy, and all KPIs can be set to trigger alarms. After a few configuration clicks, the user gets a live view of the chosen KPIs, enabling instant monitoring of machine status.

Global M2M
www.globalm2m.com.au

Tunable LED linear luminaire

The GLG Siteco Scriptus is a tunable white luminaire range designed for offices and public buildings.

The luminaire offers a dual-level optic system consisting of a primary lens cluster, mixing chamber and micro-lens array. This provides a high uniformity of luminance and results in good contrast rendering and glare control.

The lighting technology is an inherent part of the luminaire design and simultaneously ensures optimum glare reduction as well as visual comfort. With a UGR of maximum 16, the luminaire complies with all criteria for the illumination of DSE (display screen equipment) workstations.

The luminaire is designed for both surface mounting and suspending with various lengths and lumen packages available. The suspended version features separately controllable direct and indirect light components to provide high flexibility for personal settings.

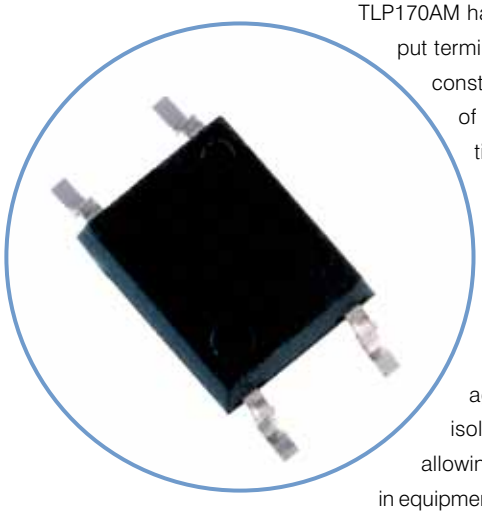
GLG

www.glg.lighting

Photorelays

Toshiba Electronic Devices & Storage has launched the photorelays TLP170AM and TLP170GM in a small 4-pin SO6 package, suitable for security systems, building automation and other industrial equipment.

The products feature a maximum trigger LED current of 1 mA, which reduces input side power loss by increasing the sensitivity of the photodiode array. Using the photorelays for ON/OFF control in battery-powered security devices and various sensors should contribute to lower power consumption and longer operation of devices.



TLP170AM has a rated OFF-state output terminal voltage of 60 V and a constant ON-state current (I_{ON}) of 0.7 A, with pulse operation of up to 2.1 A. The TLP170GM is a 350 V version with an I_{ON} of 110 mA constant current and 330 mA pulse operation.

The 4-pin SO6 package enables a minimum isolation voltage of 3750 V_{rms}, allowing the devices to be used in equipment requiring high insulation performance.

Toshiba (Australia) Pty Ltd

www.toshiba.com.au

LED street lighting connectors

The TE LUMAWISE Endurance S is a compact connectivity module for street lighting with LED light sources. The module consists of a standardised interface (Zhaga Book 18) between the receptacle and module base or sealing cap. It uses an integrated single gasket that can accommodate and seal both luminaire and module using the same connection interface for either 40 mm or 80 mm diameter central management systems.

The module offers greater flexibility in luminaire design and street lighting architecture. The system is field upgradeable, making it possible to simply and quickly upgrade existing luminaires.

Specifically for outdoor LED light sources and drivers, the product has been designed to meet Zhaga Book 18 specifications for outdoor lighting control systems. Installation is easy due to its simple push-and-twist lock feature which does not require any tools and can be completed using one hand. It can be mounted in any direction and, according to the company, it offers improved sealing when compared to other systems. Modules can be exchanged and upgraded in only a few seconds without having to electrically isolate the lighting pole.

TE Connectivity

www.te.com

ENSURING SAFE FIRE CONTAINMENT WHEN CABLING

Paul Stathis, Chief Executive Officer, BICSI South Pacific

Fire issues such as detection, suppression and containment of fire and smoke aren't normally a concern for the cabling industry — these are typically left to fire professionals. However, they become paramount to cablers if they route cabling through building elements that are deemed as fire containment barriers.

Applicable regulations

Most regulations imposed on any industry generally revolve around safety for the public and for the industry itself. The mandatory cabling regulations for our industry — AS/CA S008 (products) and AS/CA S009 (installation) — are based on the 'pillars' of safety and network integrity. Key safety issues in the current S008 and S009 regulations are proximity of metallic telecommunications conductors to electrical conductors, earthing and exposure to laser emissions. The soon-to-released S008 and S009 revisions will add warnings about the newly introduced ES3 energy sources, which are classified as hazardous.

Australia's building regulation — the National Construction Code (NCC) — doesn't invoke cabling requirements. However, compliance must be factored in by cabling and all other services installed in buildings, as it is integral to the safety of building occupants — and thereby users of the building services.

While the NCC doesn't specifically address cabling, it has relevance to telecommunications pathways, particularly concerning fire containment. Cablers aren't permitted to reduce the integrity of any fire-containment measures within a building. Where designated fire-containment measures exist, services are permitted to run through them, but their integrity must be promptly reinstated using approved measures. (Note: The AS/NZS 3084:2017 'Telecommunications pathways and spaces' standard provides excellent guidance on telecommunications pathways.)

The NCC comprehensively defines the purpose and applicability of fire-resisting building elements and other means to constrain the spread of fire in buildings e.g.

Clause C2.7 Separation by fire walls'

- "(ii) Any openings in a fire wall must not reduce the FRL [Fire Resistance Level] required by Specification C1.1 for the fire wall..."

Clause C3.15 Openings for service installations'

- "Where an electrical, electronic, plumbing, mechanical ventilation, air-conditioning or other service penetrates a building element that is required to have an FRL with respect to integrity or insulation or a resistance to the incipient spread of fire, that installation must comply with...Specification C3.15."

The NCC addresses situations where cabling may pass through fire-resisting building elements, but requires the penetrations to not reduce the barrier's FRL. Importantly, this imposes the responsibility to maintain the FRL on whoever makes the penetration.

The soon-to-be-released revised AS/CA S009 regulation has an updated fire-stopping clause to provide sound direction for cablers on what needs to be done when they encounter fire-resisting building elements obstructing their cabling pathways; as well as outlining their accountabilities when contemplating penetrations to these barriers.

Scenarios

Let's consider penetrations in fire-resisting building elements in two distinct scenarios:

1. Cabling in new construction sites is commonly installed prior to building completion and typically before fire certification. Therefore, service installers may simply be instructed by the head-contractor/builder to route cabling through penetrations the builder has already made in fire-resisting building elements. In this instance, the builder would be responsible for reinstating the FRL of the barrier. But this doesn't automatically remove a cabler's duty of care to maintain safety in a building. For their own protection, it's advisable for cablers to obtain a written statement from the head-contractor/builder that they are sealing the penetration to return the barrier to its designated FRL. If there's no written statement on who is responsible for rectifying the penetration in the barrier, cablers may find themselves still accountable for losses incurred from a fire passing through the penetration, even years later.
2. Installing cabling in existing buildings — which may need to be routed through penetrations in fire-resisting building elements — is where a cabler is more likely to be confronted with the decision on what to do, thereby seeking directives on a compliant methodology. The building will already be deemed safe by fire professionals, so any penetrations in a fire-rated barrier would compromise the integrity of the building's fire-safety certification. In this instance, cablers are advised to first consult with the building owner, or person responsible for the building's ongoing compliance if a barrier is a fire-resisting building element. If so, the cabler must be fully aware — before doing anything else — that any penetration they make in that barrier will reduce its effectiveness to contain the spread of fire and that they can be held accountable for that compromise. However, they should not rush to increase their insurance policies. The NCC recognises this is a common occurrence in many buildings over their lifespan, and has recognised safe and reliable methods to effectively seal penetrations in fire-resisting building elements that return the barrier to its FRL. It requires penetration-sealing systems to be "tested in accordance with AS 4071 and AS 1530.4 and achieved the required FRL or resistance to the incipient spread of fire…The determination of the required FRL must be confirmed in a report from an Accredited Testing Laboratory in accordance with Schedule 5."

Industry consultation

In consulting many industry stakeholders for this article, it was apparent that, while a heavy responsibility, sealing penetrations in fire-resisting building elements can and is being done safely and cost-effectively.

The Fire Protection Association of Australia stressed:

3. Anyone making a penetration in a fire-resisting building element is accountable for the reduction in that barrier's fire containment and is therefore responsible to reinstate its FRL.
4. Given the emphasis on safety within buildings, standards for the various services within a building should be consistent with the fire regulations in the NCC.

Most of the electrical and cabling contractors consulted said their standard procedure in dealing with potential penetrations in fire-resisting building elements was to firstly consult with the facility manager or building owner to check if the barrier was fire-rated or not. If it was, they would make an appropriately sized penetration, route the cables and then seal it with an NCC-compliant method — typically fire-rated sealants or fire-collars. One electrical contractor cited the 'Tested Systems' outlined in Clause C3.15 of the NCC and said "It's my go-to place to cover my butt." Others said they occasionally used the spare capacity in existing penetration-sealing systems, and routed cables through them. In every instance, however, they were very conscious of their responsibility to not compromise the integrity of the barrier and took steps to ensure they didn't reduce the integrity of what was already in place — effectively 'covering their butts' from fire-damage liabilities.

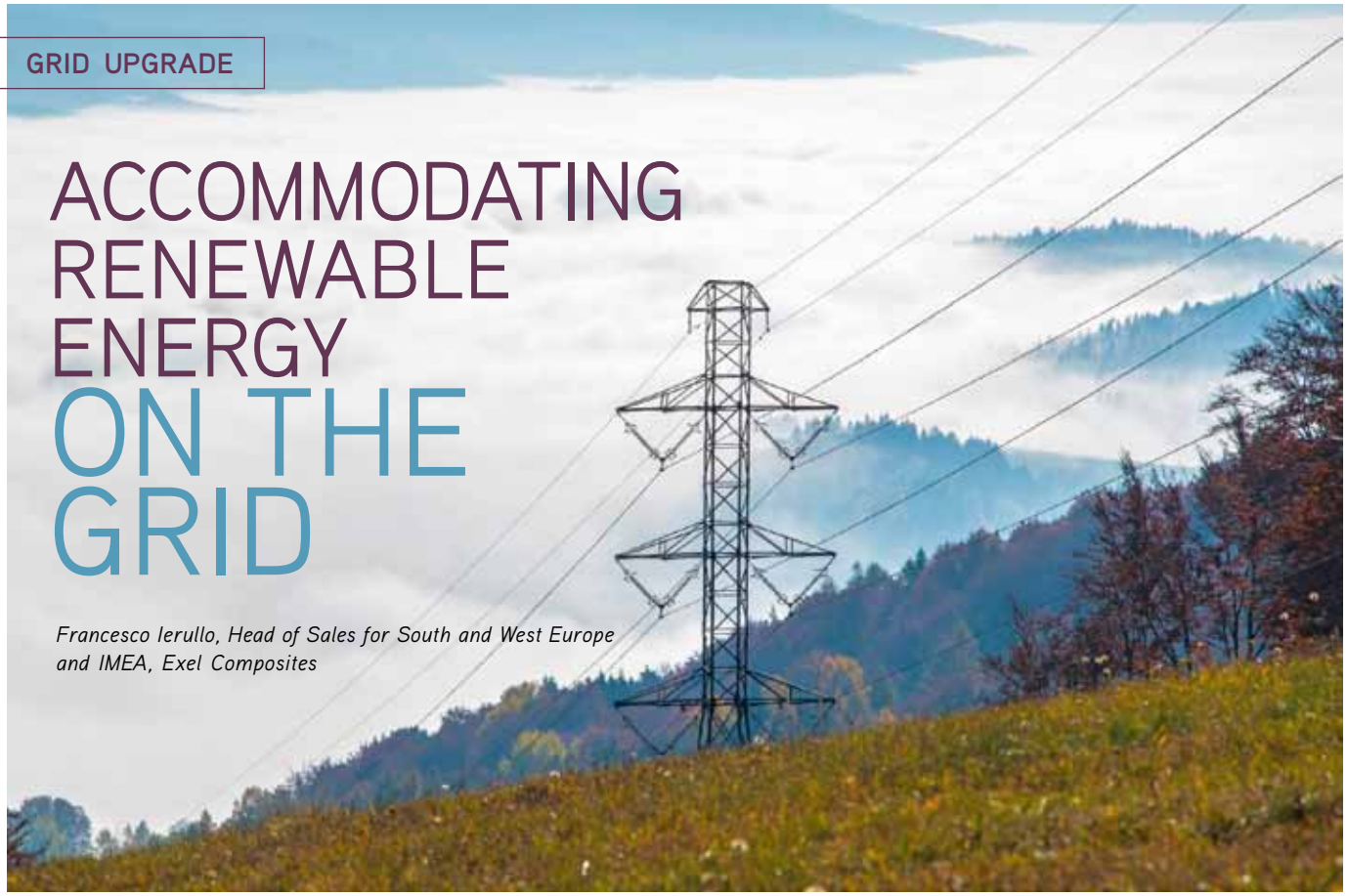
Cabling registrars commented that, where cablers had to penetrate a fire-resisting building element, many would take photos of any penetrations and cabling passing through them after being appropriately sealed and included them in TCA1 forms they submitted to clients and retained for their own records. Where they found existing penetrations they considered 'dodgy', they submitted TCA2 forms to formally distance themselves from sub-standard or possibly non-compliant work done by others.

Accountability

Fire-resisting building elements are designed and certified by fire professionals, who are held accountable for their determinations. This is typically carried out at the construction phase of a building, with the NCC stipulating the required fire-compartment compliance for specific building classifications. Once compliance is granted, the building is considered safe to occupy. However, anyone who creates penetrations that reduce the building's fire integrity is accountable for that compromise and must take steps to reinstate that defined fire integrity.

BICSI South Pacific
www.bicsi.com.au

ACCOMMODATING RENEWABLE ENERGY ON THE GRID



Francesco Ierullo, Head of Sales for South and West Europe and IMEA, Exel Composites

In order to use renewable energy to its fullest potential, electrical infrastructure needs to be upgraded to support the increase in supply.

The 'Renewable Energy Sources and Climate Change Mitigation' report by the International Panel on Climate Change (IPCC) highlights that renewable energy has the capacity to displace greenhouse gas emissions from fossil fuel combustion, while simultaneously improving energy access.

In order to use renewable energy to its full potential, electrical infrastructure must be updated to accommodate the increase in supply and transport power to where it's needed. This article discusses how using composites can improve renewable energy transmission across the grid.

Despite efforts to lower energy use, the rising population and economic growth are driving global energy demand. To balance global demand with clean energy use, we must invest in projects that enable increased use of energy from renewable resources. However, to accommodate a widespread use of renewables in infrastructure, the grid must be capable of meeting modern energy demands.

A closer look at conductors

Renewable energy sources may be located far from where the generated energy is consumed. For example, the majority of wind power plants in Italy are based in the south of the country, but the nation's industrial hub is located in the north. As a result, transmission and distribution infrastructure must be capable of carrying the additional load. Many of these powerlines were installed decades ago and were not designed to accommodate the additional mix of modern energy sources.

Traditional conductors consist of an outer aluminium conducting ring and a reinforcing steel core — known as aluminium conductor steel reinforced (ACSR) conductors. However, their current capacity is limited by the steel core that has a high coefficient of thermal expansion, meaning the heat from the current passing through the conductor and the ambient temperatures cause the steel to expand.

The result is a lengthening of the conductor between the tower supports, which causes thermal sag, where the conductor drops lower to the ground. This is exacerbated in older conductors that have a natural sag after being hung for decades. Sag that exceeds standards poses a safety risk and can lead to power outages, so these conductors must carry a lower current.

Despite the issues of the old conductors in the grid, many utility companies are reluctant to perform a complete replacement of tower infrastructure as it requires a great amount of labour, time and economic investment. This is particularly true in areas with uneven terrain, such as mountains where additional equipment such as helicopters may be required.

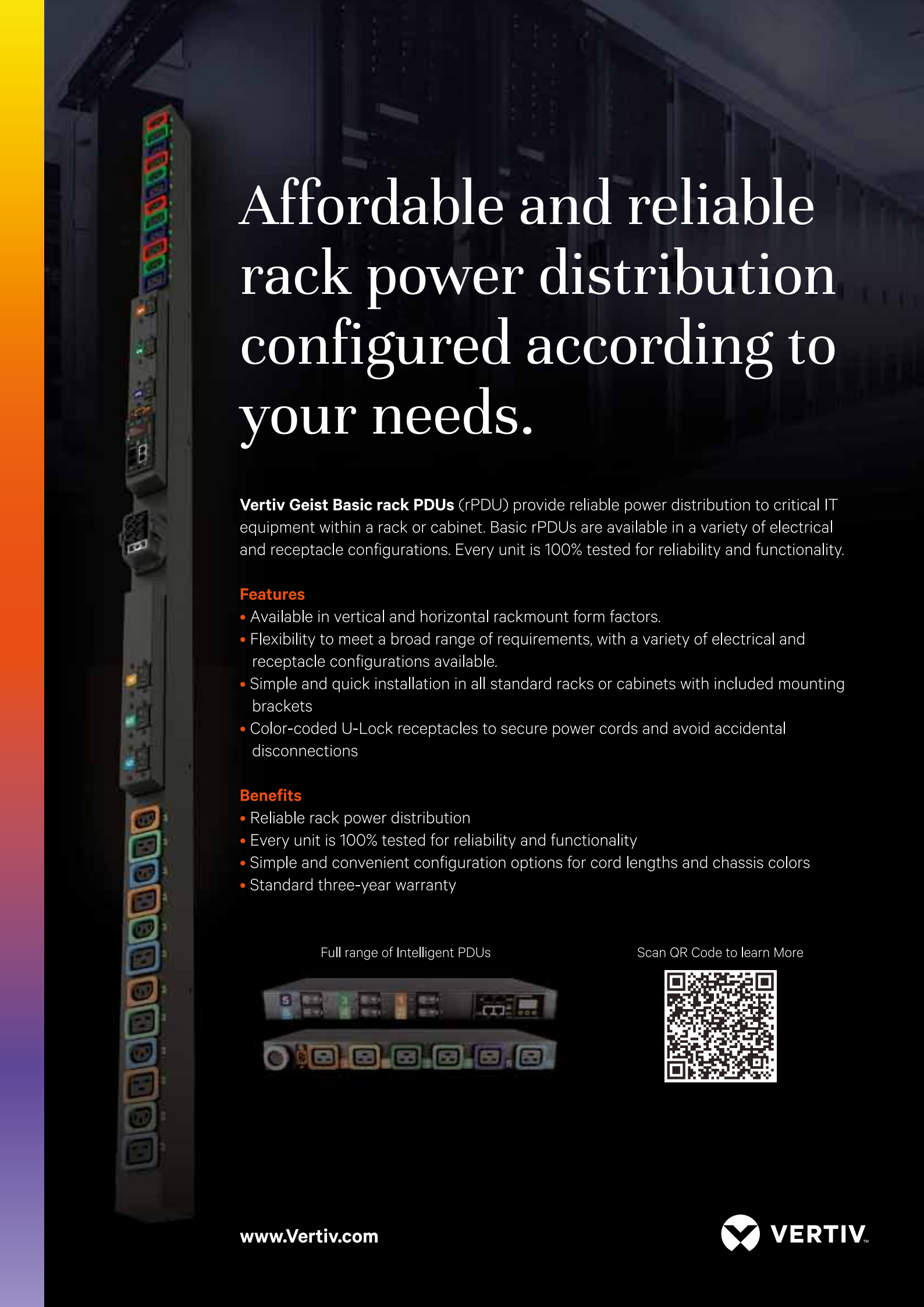
A composite solution

In place of a complete infrastructure replacement, ACSR lines can be upgraded to composite cored conductors, which have a lower coefficient of thermal expansion, allowing the conductor to carry over twice the amount of current. The high strength-to-weight ratio of composites translates into a higher tensile strength, which allows the conductor to be pulled tighter. Composite cores are more lightweight than steel, allowing more conducting aluminium in the conductor and therefore increased transmission capacity.

The upgrade is significantly cheaper than total grid replacement, as it can re-use the existing pylon and tower infrastructure. The process is also substantially faster, which minimises disruption to energy supply. Additionally, if the composite cored conductors are used in a new area where the electrical infrastructure must start from scratch anyway, the high current capacity allows the tower count to be reduced.

Renewable energy will play a crucial role in mitigating climate change, and provides the opportunity to improve energy supply. Upgrading older powerlines from steel cored conductors to composite alternatives will increase the current capacity of the grid, transporting renewable energy efficiently from generation to end use — helping to power the future.

Exel Composites
www.exelcomposites.net



Affordable and reliable rack power distribution configured according to your needs.

Vertiv Geist Basic rack PDUs (rPDU) provide reliable power distribution to critical IT equipment within a rack or cabinet. Basic rPDUs are available in a variety of electrical and receptacle configurations. Every unit is 100% tested for reliability and functionality.

Features

- Available in vertical and horizontal rackmount form factors.
- Flexibility to meet a broad range of requirements, with a variety of electrical and receptacle configurations available.
- Simple and quick installation in all standard racks or cabinets with included mounting brackets
- Color-coded U-Lock receptacles to secure power cords and avoid accidental disconnections

Benefits

- Reliable rack power distribution
- Every unit is 100% tested for reliability and functionality
- Simple and convenient configuration options for cord lengths and chassis colors
- Standard three-year warranty

Full range of Intelligent PDUs

Scan QR Code to learn More

www.Vertiv.com

VERTIV.

Compact connector enclosures

Ilme has expanded its 21.21 Series compact enclosures, offering a range aimed at satisfying all types of environmental requirements and installation needs.

Developed for large-diameter cables using an M25 cable entry, the latest hoods are a suitable solution for the robotics and automation sectors due to their wiring flexibility and compact size.

The MKA metal hoods are available in several variants according to the application demand, including standard, EMC shielded or resistant to aggressive environments. They are also available with a classic lever with rolls, or with a rigid stainless or galvanised steel lever for higher mechanical loads, and are suitable for free cable-to-cable joints.

The MK insulating hoods are made of thermoplastic material and are available in two different colours: the standard RAL 7035 light grey or RAL 9005 black. The line includes models with pegs or a locking lever, with or without glued sealing gasket. Due to the conductive coating and the tight screw or bayonet locking, they grant an IP68 degree of protection.

Treotham Automation Pty Ltd
www.treotham.com.au

Luminaires

The DOT Downlights KIMBAL series of luminaires are designed for commercial, health and retail applications. Offering stylish and adjustable forward-thinking luminaire design, the collection features four distinct lighting solutions: fixed and adjustable recessed downlights, surface-mounted downlights and spotlights.

The range offers advanced LED technology, increased environmental consideration and seamless design. The adjustable recessed KA6 series features a heatsink to assist in lifespan, optional remote Bluetooth-compatible multi-wattage drivers and a tool-free mounting system.

The range is available in 3500K, specifically to comply with 2020 J6 regulations, and every element of the chassis is either recyclable, re-usable or compostable. It is designed to enable replacement of LED light sources and electronic control gear to uptake future technology advances or at end of life.

The range has been independently tested and is compliant with current Australian and New Zealand standards. It has undergone photometric testing, with supporting documentation available for review, including IES Files, Revit Files, LM80 Test report, LM79 Test Reports and a Website Configurator.

Pierlite Australia Pty Ltd
www.pierlite.com.au

Compact managed switches

The Hirschmann Gecko 8TX and Gecko 8TX/2SFP managed switches offer four to eight fast Ethernet ports and the option for two Gigabit SFP slots to save space and cost while increasing bandwidth.

Updated features of the Gecko switches include VLAN support as well as the MRP protocol to complement existing RSTP support, and IGMP snooping for multicast control. Management and monitoring of the device has further been enhanced with the addition of an SNTP client for time synchronisation to ensure that the log files and information generated are accurate and useful. EtherNet/IP and Profinet industrial profiles can be used to easily integrate the device into the application.

These additions are said to make the GECKO switches a fully functional light managed switch, with a low-cost entry point, a small footprint and eco-friendly power consumption.

Control Logic Pty Ltd
www.controllogic.com.au

CASE STUDY

Early detection of faulty powerlines proves critical

A faulty powerline has been detected before it fell in a high fire danger area of Victoria.

The high-tech early fault detection (EFD) system had been installed on a 13,000-volt powerline at Porcupine Ridge near Daylesford, and located a broken conductor strand that was promptly repaired by Powercor's line crew.

This is the third powerline at risk of falling that an EFD has found during a small-scale government-funded trial covering less than half a per cent of Victoria's high fire-risk powerlines. The results of this trial indicate that all 30,000 km of Victoria's single-wire powerlines in high fire-risk areas could have EFD monitoring installed for about $30–40 million.

The trial finished 12 months ago in mid-2019 but IND Technology has kept the trial systems running. Both AusNet and Powercor are taking over ownership of the trial systems on their networks and are committed to keep them running as they consider future use of EFD systems.

"The EFD system covering the Porcupine Ridge powerline first picked up indications of trouble in mid-April and we confirmed the breakage when we visited the site in mid-May. We alerted Powercor, which immediately sent a crew to make the conductor safe, so it couldn't fall or unravel further to create an electrocution risk from hanging strands of wire. They came back and fully repaired it two days later," said Dr Alan Wong, CEO of IND Technology (IND.T), which develops and sells EFD systems around the world.

Local landowner Michael Thorne said that if the strand had kept unravelling, someone could easily have walked into it and been killed.

"If a fire started under this powerline in the peak of summer it would likely run up the hill to destroy our property and others further along Porcupine Ridge. An afternoon wind change would then likely drive it into the state forest only a few hundred metres away. The outcome could be very bad," Thorne said.

The line had been inspected just a few months earlier and would not have been inspected again until after two more fire seasons. Broken conductor strands like this one were implicated in Victoria's worst-ever powerline fire disaster, the Kilmore East Kinglake fire which killed more than 120 people on Black Saturday.

Trials of IND.T's EFD technology in California have also demonstrated early detection of broken and damaged powerline conductors as well as many other types of powerline faults that are known to cause fires. Early results there illustrate the potential for EFD to cut California's wildfire risk. Trials are now underway or planned by seven US utilities in four states, as well as one European utility and an electric rail network in China. NSW network owner Endeavour Energy is installing a small trial of EFD on selected Blue Mountains powerlines.

Power industry research continues to report utility powerline monitoring using visual inspection at multi-year intervals is mainly driven by the incidence of conductor falls and that a reliable and cost-efficient means of assessment of the likelihood of conductor fall is urgently needed.

The EFD technology produced by IND.T uses pole-mounted sensors every five kilometres. It continuously monitors powerline networks to detect problems before they create serious safety risks, such as bushfires, locating them accurately within 10 metres so crews can go directly to the problem and repair it. It was developed by IND.T with support from Deakin and RMIT Universities.

DIN rail enclosures

Hammond Electronics has announced its 1597DIN family of UL94-V0 flame-retardant plastic enclosures for mounting to standard IEC/EN 60715 35 mm DIN rails for applications such as industrial control equipment, automation, equipment management and monitoring, HVAC controllers and distributed IoT equipment.

The family consists initially of four sizes in 2-, 4-, 6- and 9-module widths. All sizes have two mounting positions for the terminal blocks, maximising I/O availability and giving headroom for future expansion if required.

There are two horizontal PCB mounting slots in the body and two stand-offs in the base for component or PCB mounting. Plain, vented, knockout and slotted terminal covers are supplied separately and can be mixed and matched in the bodies as required. Primarily designed to accept PCBs is a slimline 22.5 mm wide, 118 mm deep and 90 mm high polycarbonate control box with ventilated sides and a shaped front panel.

All units feature simple no-tool snap together assembly and correspondingly easy disassembly for access to the internal components or PCB when required. The bodies are ventilated on the top and bottom faces and feature a recess in the front panel for mounting identification labels or other graphics.

The bases are moulded in dark grey PPO (polyphenylene oxide) with a polystyrene DIN rail mounting clip and the main enclosure body is RAL 7035 light grey polycarbonate.

Hammond Electronics Pty Ltd
www.hammondmfg.com

Protection relay

The ABB REX640 protection relay provides secure and flexible standardised communication, both within the substation and remote monitoring system.

The all-in-one protection relay has been designed to protect any asset in advanced power generation and distribution applications. It is able to cover the full range of utility and industrial applications and to evolve with the grid. Its fully modular design, together with the continuous access to software and hardware developments, allows lifelong readiness to easily adapt when protection requirements change.

The relay supports a variety of communication protocols for access to operational information and controls, and now also the remote communication protocol IEC 60870-5-104 for power system automation. IEC 60870-5-104 allows easy and direct connection to an upper-level system such as SCADA (supervisory control and data acquisition) without a gateway. To further improve cybersecurity, REX640 introduces secure communication for the IEC 60870-5-104 and DNP3 protocols according to the IEC 62351 standard.

With GOOSE (generic object oriented substation event) communication being an enabler for digitalised protection and control schemes in substations, REX640 is now able to receive simulated GOOSE messages for easy testing of the schemes. Once a relay has been set to allow simulated GOOSE messages, it will reject GOOSE messages sent by other relays and accept simulated messages sent by a testing device instead. This conveniently supports periodical testing, where normally one feeder at a time is subject to testing while the other feeders remain in operation.

ABB Australia Pty Ltd
www.abbaustralia.com.au

Grommet for LED lights

The TSS grommet for LED lights by TST is designed for manufacturers of luminaires. It has an attractive design, useful features and flexibility.

The grommet has a pop-out membrane, leaving a sealed and waterproof installation until it is penetrated by a cable. It can also be used as an end plug and it is approved for IP67.

It is flexible and handles a wide range of cable diameters. TSS is designed to be fixed securely in the opening, including when larger cables are installed. Since the material is soft, it is suitable for use on curved surfaces, as it will adapt to the shape of the surface.

Treotham Automation Pty Ltd
www.treotham.com.au

HOW DIGITAL MARKETING COULD SAVE YOUR ELECTRICAL BUSINESS

Suzanne Mitchell, Marketing Director at GoDaddy Australia

Many businesses are currently undergoing severe financial strain due to the impact of the COVID-19 pandemic, meaning that effective digital marketing has never been more important.

Whether it's to help mitigate the impact of this financial crisis, or supply the potential demand stimulated by the HomeBuilder scheme, electricians can use intelligent marketing techniques to their advantage.

During a period when business-as-usual has been almost entirely disrupted, implementing a fresh, futureproof digital marketing approach could provide a competitive advantage for electricians to exploit in the coming months. So, as the industry gently embarks into the 'new normal', here are a few digital marketing strategies to add to your business toolbox.

How to build your digital presence...

Today, many of the most in-demand electricians are not just those who do the best work, but who promote their work best. With the recent introduction of HomeBuilder, there could now be an increased demand for your services — if they're marketed effectively. As the internet has become ubiquitous to everyday life, Australians are increasingly using it to purchase goods and research services. So in 2020, it's no use only being listed in the Yellow Pages when your audience are using online channels to find businesses today.

Consider building a website to act as the hub of your digital marketing strategy. Before you do so, you'll need to choose and register a domain — the address that appears in the URL. Try to make it short, memorable and representative of your business like, for example, essendonelectric.com.au. When building your website, today you needn't be a coder or graphic designer when solutions like GoDaddy can help you build a professional site. Use your website to share your expertise, services and the geographical areas you work, publish positive testimonials, post images of the new projector you installed or the switchboard you wired, and make your contact details easily accessible for people to contact you to arrange a consultation.

...and how to market it

Having a professional website is a start, but putting it in front of current and prospective clients is what matters to help boost your business. There are relatively straightforward and cost-effective digital marketing strategies to help, which is particularly important now when both time and money are of the essence. Nearly half the world's population uses email, so it's safe to say many of your clients will too. To help your brand be consistent and build customer trust, consider creating an email address that matches your domain, like hi@essendonelectric.com.au. Whether it's informing them of crucial business updates, promoting a new service or qualification, or sharing a recent testimonial or installation you're proud of, email marketing can be a quick, cost-effective method to help you stay top of mind and build stronger connections with your clients.

While email is a great way to engage with existing clients, SEO (search engine optimisation) can help make your website — and by extension, your business — more visible to prospective clients. SEO is an algorithm that helps determine where your website will rank when someone searches for a related term online. The better optimised your website, the higher it's listed by search engines, so it's important to populate it with relevant content. To help boost your site's SEO ranking, consider adding phrases that people may be searching, like 'licensed electrician Sydney' or 'HomeBuilder electrical engineer Tasmania'.

While we're embarking into a period of potentially prolonged uncertainty, businesses that succeed long-term may be those who not only do the best work, but also who promote their work best. So, as you look to grow and take advantage of the demand from HomeBuilder, consider how digital marketing can help your business grow in the 'new normal'.

LED smart lighting for solar inverters

IMEON ENERGY LED smart lighting can be installed on solar inverters, allowing the inverters to interact with smart lights from the Philips Hue range of products.

The application sends information using light signals, encouraging users to optimise energy savings by adapting their electricity consumption habits.

By making the user aware of elevated electricity consumption, as well as the times when the solar installation energy storage is capable of high energy output, the product enables users to adapt consumption habits to maximise energy savings. According to the company, this can result in a 10% reduction in electricity consumption.

The LED smart lighting application allows the inverters to communicate with the smart lights to discreetly send information to the user via light signals. For example, the lamp can turn red when the electrical power drawn from the electricity network exceeds a user-defined threshold, it can turn green when the autonomy of the equipped site is optimal and it varies from green to orange depending on the state of charge of the battery pack.

All the parameters of the application can be modified by the user via the IMEON OS. ONE interface. The LED smart lighting application also introduces a 'smart dimming' feature that allows the inverter to change the brightness of the lamps depending on the level of sunlight.

IMEON ENERGY

www.meon-energy.com.au

Floodlight camera

The Arlo Pro 3 floodlight camera is wire-free, with powerful LEDs and an integrated 2K HDR camera. It offers a 160° field of view, two-way audio, custom lighting configurations and a built-in siren to any home or small business.

It lends itself to a number of uses through a robust suite of smart features and subscription-based service, Arlo Smart.

With a seamlessly integrated camera and floodlight design, the product is an all-in-one solution to help users keep a watchful eye on homes and small businesses.

It implements a variety of features to clearly identify and alert who or what is outside a user's home — ensuring maximum image and audio quality even in instances where users might typically experience a washout effect from brightness or distracting background noise.

The platform works with Amazon Alexa, Google Assistant and IFTTT for easy interaction, automation and control.

Due to a dedicated ambient light sensor, the floodlight camera can automatically measure the amount of surrounding light to allow for customisation for when the floodlight automatically turns on upon motion or audio detection.

Arlo Technologies International Ltd

www.arlo.com/au/default.aspx

Apartment IP video intercom system

The Panacom Apartment IP Video Intercom System is a cost-effective system designed for medium to large residential apartments while maintaining ease of installation and programming. Using standard cat-5e network cables and utilising PoE (Power over Ethernet) technology, system wiring is simple and flexible with expandability up to 98 buildings, with each building allowing up to 799 apartments and 19 door stations. System programming is simple with no requirement for difficult networking set-up or IP addressing.

The flush-mounted brush aluminium door entry panel with 2 MP camera resolution and IP64 weather rating also comes with integrated RFID reader for access control. Calling residents is quick and easy with a crystal clear 3.5″ LCD display screen with built-in electronic phonebook.

For residents, the 7″ internal touchscreen LCD monitor will provide sharp images of visitors during day or night with built-in white LED lights on the door panel. An easy-to-use GUI makes navigating all the features easy including apartment to apartment calling, apartment to apartment text messaging and monitoring of up to 32 x IP CCTV cameras.

The optional monitor with built-in Wi-Fi will allow answering, monitoring and door release from the user's mobile phone via the dedicated Panacom app and allow connection of a secondary single button video door panel at the front door of each apartment. Other standard features include, expansion up to 3 monitors per apartment, alarm sensor connection and dedicated concierge/building manager control monitor.

PSA Products

www.psaproducts.com.au

Portable oscilloscope

The Fluke 200 MHz 4 CH ScopeMeter is designed for engineers who require a light-weight oscilloscope for testing in the lab or harsh industrial environments. It is available to rent from TechRentals.

The Fluke 200 MHz 4 CH ScopeMeter is part of the Fluke 190 Series II ScopeMeter. It comes with four floating, isolated input channels and a range of operational features including digital persistence mode, roll mode (30,000 points/channel for low frequency signal analysis), TrendPlot paperless recording and Connect-and-View triggering.

This high-performance portable oscilloscope offers 10,000 points/trace waveform capture (scope mode), a sample rate of 2.5 GS/s and independently insulated inputs with IP51 dust and drip-water proof rating.

The oscilloscope has a safety rating CAT III 1000 V/CAT IV 600 V and a USB host port for direct data storage.

TechRentals

www.techrentals.com.au

60-cell solar panel

The REC Alpha Series 60-cell solar panel is designed to reach 380 W-peak power and deliver over 20% more power from the same area and the same number of panels.

Now available in Australia, the panels are built around 120 half-cut heterojunction cells (HJT) and advanced connection technology, designed by engineering experts from Germany and Singapore. With HJT, REC combines the benefits of crystalline silicon solar cells with those of thin film technologies for higher efficiency and energy yield, even at higher temperatures.

With a strong frame, the panels can provide protection against extreme weather events, reducing the chance of cell damage and ensuring continued high-power performance. The panel is suitable for both cold and hot climates, thanks to a temperature coefficient of -0.26%/°C.

The Alpha Black version provides design aesthetics and a premium look to the solar panels thanks to its sleek black colouring, and is fitted with near-invisible cell connections.

Other features include: two versions available: with white back-sheet (up to 380 Wp) and as a full-black panel for good aesthetics (up to 375 Wp); twin panel design provides performance in shaded conditions; half-cut cell technology; high-efficiency n-type mono wafers between thin layers of amorphous silicon; 30 mm thin frame construction allows more panels per pallet and an easy installation.

The panels are also backed by REC's 25-year product warranty (on installations by REC Solar professional, otherwise 20 years) and a 25-year power output warranty, guaranteeing 92% of nameplate power after 25 years.

REC Group

www.recgroup.com

IP adapter

The Global M2M BACnet IP adapter for the Crevis range of distributed IO has been released as part of the company's Smart City product portfolio.

The BACnet IP network adapter model number GN-9521 conforms to the device profile BACnet Application Specific Controller (B-ASC). The module also supports the sub protocol MODBUS/TCP, MODBUS/UDP, HTTP, DHCP with up to 10 TCP connections and a serial RS232 port for use with the IOGuidePro software configuration tool or Modbus RTU slave for connection to HMIs, BMS controllers or PLCs. Rather than having fixed IO blocks Crevis slice IO provides the flexibility to build the user's system to the exact size, specifications and IO signals for their building automation I/O system. An IO node can be expanded from just a few slices up to 32 slices when needed. The supported object size is 256 objects (for IO channels only).

The G series distributed IOs provide users with a good level of field and bus connectivity for smart integrated solutions through a wide range of digital, analog and special modules for almost any signal type. There are over 22 x digital I/O module variations including 110/240 VAC input modules, 2-amp relay output modules, over 40 analog modules including RTD, thermocouple and temperature controllers modules. Installation, service and modification has been made less complicated. G series IO nodes are easily mounted on a standard 35 mm DIN rail with removable terminal blocks (RTB).

Global M2M

www.globalm2m.com.au

Battery range for industrial electrical applications

The Magellan VRLA battery range provides durability for a range of industrial electrical applications.

It provides good performance and reliability in long duration discharge applications.

Features include high corrosion-resistant performance; high energy and power density; optimised capability of instant high current discharging; good charge ability; strong high- and low-temperature performance; precision sealing technology; and 10 years' design life.

Magellan Power

www.magellan-power.com.au

TOP 10 DATA CENTRE TRENDS FOR 2025

The top 10 trends expected for data centres in the year 2025 have recently been released by Huawei.

From 2010 to 2019, data centres evolved from ICT equipment rooms to cloud technology. Rapid development of new technologies such as artificial intelligence, cloud computing, big data and 5G is expected to bring a new era, with a dramatic increase in market demand for data centres.

At the same time, data centres are facing challenges such as difficulties in obtaining resources for construction, lengthy construction periods and high energy consumption.

The top 10 trends for data centres, as predicted by Huawei, are listed below.

1. High density power

CPU and server capacity are continuously increasing, as IT computing capacity continues to evolve. As demand for AI applications rises, the importance of AI computing power further increases. To balance efficiency and costs, data centres will become equipped for higher power density. Currently, the average power capacity in a data centre is 6 to 8 kW/rack. It is anticipated that power density of 15 to 20 kW/rack will dominate data centres by 2025.

2. Scalable architecture

Generally, the lifecycle of IT devices is three to five years, and the power density doubles every five years. However, the lifecycle of data centre infrastructure is 10 to 15 years, and the data centre facility will support IT device evolution for two to three generations. This demands scalable expansion and phased investment for optimal CAPEX in the lifecycle of a data centre. In addition, the data centre must support hybrid deployment of IT devices with different power densities because of the diversified IT services it runs.

3. Green power

Currently, data centres account for 3% of the world's total power consumption. It is estimated that the total power consumption of a data centre will reach more than 1000 TWh by 2025. Energy saving, emission reduction and operating expense (OPEX) reduction are big challenges. Reducing power usage and building green data centres is therefore inevitable — the use of clean energy and waste heat will help to save resources (such as energy, land, water and materials) throughout the lifecycle of the data centre.

4. Quick deployment

Internet services usually 'burst' in a short period of time, and data and traffic demands on the service side increase sharply. Therefore, data centres must be rolled out quickly. On the other hand, the data centre is changed from a support system to a production system, and a faster rollout means faster benefits. The typical TTM of a data centre is nine to 12 months, which is expected to be shortened to less than six months in the future.

5. Full digitalisation and AI-enablement

Data centre facilities will inevitably evolve towards digital, and become more intelligent. With the continuous improvement of IoT and AI technologies, data centres will gradually evolve from single-domain digitalisation (in terms of O&M, energy saving and operation), to full-lifecycle digitalisation and automation (in terms of planning, construction, O&M and optimisation). It is predicted that AI will be widely applied.

6. Full modularisation

More data centres will be constructed in full modular mode to address the problems of slow construction and high initial investment costs. Modular design will evolve from component modularisation to architectural and equipment room modularisation. This full modular design will enable fast deployment, flexible capacity expansion, simple O&M and high energy efficiency.

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7. Simplified power supply architecture

The power supply and distribution system of a traditional data centre is complex and fragmented. It also creates a large footprint, and it is difficult to locate faults. Simplified power supply architecture will reduce power conversion times, shorten the power supply distance and footprint, and improve the space utilisation rate and system energy efficiency. Compared with lead-acid batteries, lithium batteries have advantages in terms of footprint and service life. As the cost of lithium batteries decreases, they will be widely used in data centres in the future.

8. Convergence of liquid cooling and air cooling

GPU and NPU applications generate more high-density scenarios, and liquid cooling systems will enjoy increased popularity. However, some storage and computing services are still in low-density scenarios. To quickly adapt to uncertain IT service requirements in the future, the cooling solution must be compatible with the air cooling system and liquid cooling system. In addition, the complex architecture of the chilled water cooling system hinders quick deployment and easy O&M. An indirect evaporative cooling system, with modular architecture, will shorten the deployment time and simplify O&M. In addition, by fully utilising natural cooling resources, power consumption of the cooling system will be greatly reduced. In areas with suitable climate, the chilled water system will gradually be replaced by indirect evaporative cooling.

9. Dynamic linkage between bits and watts

Instead of focusing on a data centre's energy facilities, its energy consumption needs to be evaluated and optimised as a whole. Through full-stack innovation, IT, chipsets, data, cloud, bits and watts will work collaboratively to achieve dynamic energy saving and optimal energy efficiency of the entire system.

10. Trustworthiness

As a data centre facility becomes more intelligent, network security threats will multiply. The data centre must have six features: resilience, security, privacy, safety, reliability and availability, in order to prevent attacks and threats from environments and malicious personnel, including network intrusion threats.

Huawei Technologies Australia P/L
www.enterprise.huawei.com

Passive optical network solution

The Excel passive optical network solution (PON) is suitable for residential and enterprise environments.

It can efficiently deliver fibre-to-the-premise, complemented by the company's existing range of copper, fibre and racking solutions.

In a typical single dwelling unit, the Enbeam fibre dome enclosure houses an open-ended PLC splitter, which can be used to distribute fibre services to multiple single dwelling units. When the fibre meets the exterior wall of the property, it can be spliced in an Enbeam exterior splice enclosure. These are IP54 rated and can securely house the fibre, keeping it clean and protected from harsh environments and acting as a consolidation point where the external fibre meets the internal fibre. The fibre cabling can then be routed into an Environ Enclosure within the property.

There are four sizes of Environ Enclosures that have been specifically designed for confined spaces. In a typical single dwelling unit, the amount of space available for a racking solution is limited, so the small sizes of the Environ enclosures make them suitable.

The PON solution offers users a host of advantages, including increased energy efficiency due to the reduced cooling and power requirements in the mid-span of the network, as well as easier network management and increased system security. With fewer physical components than a traditional LAN topology providing higher bandwidth over long distances, the result is an efficient network that can benefit any application.

Excel Networking
www.excel-networking.com

Women's safety boots

Australian footwear brand Blundstone has combined the latest technology with design flair to launch a new range of safety boots specifically for women in the trades, building and construction industries. The Women's Safety Series boots bridge the gap between safety and style, providing a sturdy, fit-for-purpose boot designed for optimum support, protection and comfort for the toughest job sites.

The two styles are part of the wider Women's Safety Series providing an extra level of support and cushioning with Blundstone's SPS Max Comfort system. Featuring XRD Technology, the boots provide repeated impact protection by absorbing up to 90% of energy in every step. This changes the level of performance for the wearer and reduces fatigue and orthopaedic issues.

Building on standard Blundstone features, the boots are designed with moulded TPU bump caps to avoid abrasions, built-in steel shank for maximum torsional stability, impact-resistant steel toecaps for ultimate protection and rubber outsoles specifically designed to increase slip resistance in varied environments.

Blundstone Australia Pty Ltd
www.blundstone.com.au

Slim line cabinets

The MFB Slim Line series of cabinets are a smart, attractive, low-profile patch panel hub enclosure.

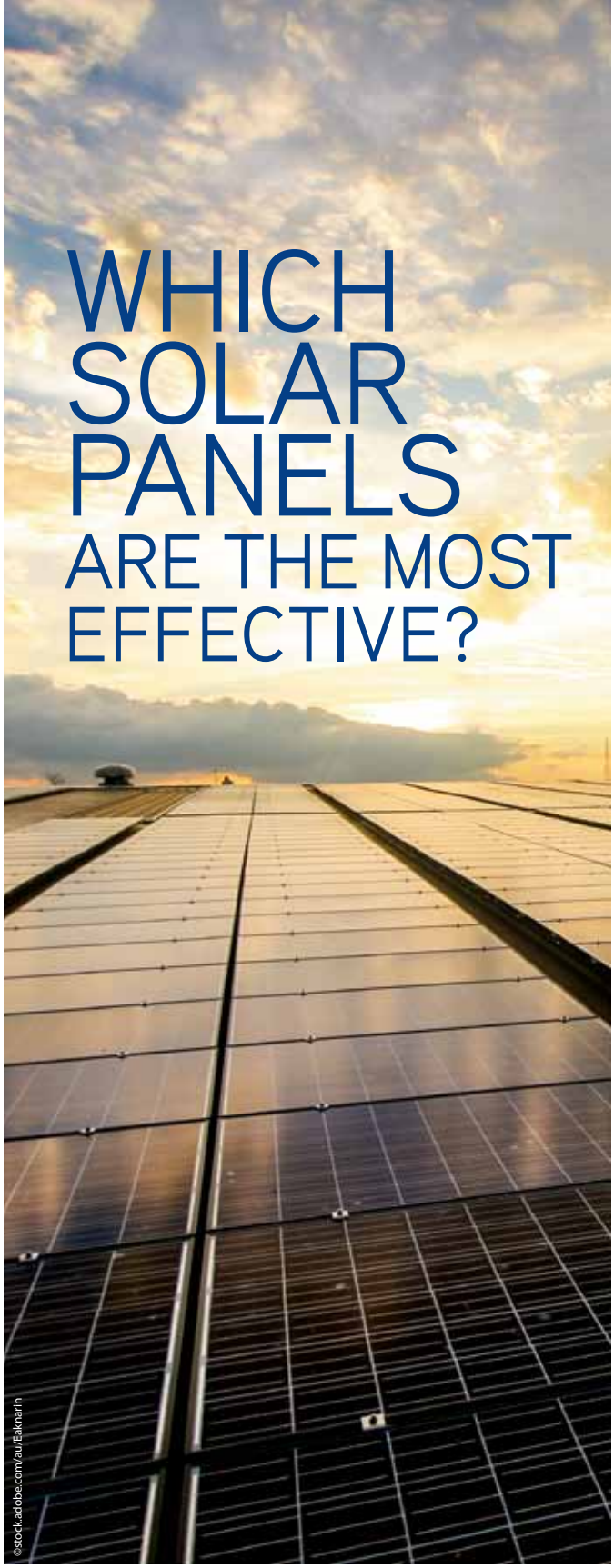
These Australian designed and manufactured cabinets, with angled doors, are suitable for the SOHO workspace or installed in confined spaces or high traffic areas.

As standard, they are available in 2RU and 3RU depths. These cabinets provide the necessary flexibility for smaller patch panel installations in a vertical wall-mounted format. They feature a large open rear area for bulk cable access. Further to this, there are 50 mm diameter cable knockouts in the top and bottom for additional cable and line feed.

The cabinets feature hinged, key-lockable vented doors, in standard key or bi-lock format for additional security. These Slim Line cabinets are manufactured from 1.0 mm zinc phosphate steel and are finished in any of the standard MFB powder coats. Custom colours are also available on request. Importantly, if the user's application requires a more customised approach with modifications to this design, the company can assist them in further developing their ideas.

MFB Products Pty Ltd
www.mfb.com.au

WHICH SOLAR PANELS ARE THE MOST EFFECTIVE?



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New research suggests that double-sided solar panels that can follow the sun are both the most energy and cost effective.

These bifacial solar panels collect sunlight from two sides instead of one and possess single-axis tracking technology that tilts the panels so they can follow the sun.

The research, which was reported in journal *Joule*, determined that this combination of technologies produces almost 35% more energy, on average, than immobile single-panel photovoltaic systems, while reducing the cost of electricity by an average of 16%.

"The results are stable, even when accounting for changes in the weather conditions and in the costs from the solar panels and the other components of the photovoltaic system, over a fairly wide range," said first author Carlos Rodríguez-Gallegos, a research fellow at the Solar Energy Research Institute of Singapore.

"This means that investing in bifacial and tracking systems should be a safe bet for the foreseeable future."

Research efforts tend to focus on further boosting energy output from solar power systems by improving solar cell efficiency, but the energy yield per panel can also be increased in other ways. Double-sided solar panels, for example, produce more energy per unit area than their standard counterparts and can function in similar locations, including rooftops. This style of solar panel, as well as tracking technology that allows each panel to capture more light by tilting in line with the sun throughout the day, could significantly improve the energy yield of solar cells even without further advancements in the capabilities of the cells themselves. However, the combined contributions of these recent technologies have not been fully explored.

To identify the global economic advantages associated with the use of a variety of paired photovoltaic technologies, Rodríguez-Gallegos and colleagues first used data from NASA's Clouds and the Earth's Radiant Energy System (CERES) to measure the total radiation that reaches the ground each day. The researchers further tailored this data to account for the influence of the sun's position on the amount of radiation a solar panel can receive based on its orientation, and then calculated the average net cost of generating electricity through a photovoltaic system throughout its lifetime. They focused on large photovoltaic farms composed of thousands of modules rather than smaller photovoltaic systems, which generally include higher associated costs per module. The team validated their model using measured values from experimental set-ups provided by three institutes and incorporated additional weather parameters to perform a worldwide analysis.

The model suggests that double-sided solar panels combined with single-axis tracking technology is most cost effective, although dual-axis trackers — which follow the sun's path even more accurately but are more expensive than single-axis trackers — are a more favourable substitute in latitudes near the poles. But despite this technology's clear benefits, Rodríguez-Gallegos does not expect this style of photovoltaic system to become the new standard overnight.

"The photovoltaics market is traditionally conservative," he said.

"More and more evidence points toward bifacial and tracking technology to be reliable, and we see more and more of it adopted in the field. Still, transitions take time, and time will have to show whether the advantages we see are attractive enough for installers to make the switch."

While this work considers standard silicon-based solar cells, Rodríguez-Gallegos and colleagues next plan to analyse the potential of tracking systems combined with pricey, top-of-the-line solar materials with higher efficiencies (called tandem technologies), which are currently limited to heavy-duty concentrator photovoltaics and space applications.

"As long as research continues to take place, the manufacturing costs of these materials are expected to keep on decreasing, and a point in time might be reached when they become economically competitive and you might see them on your roof," said Rodríguez-Gallegos.

"We then aim to be a step ahead of this potential future so that our research can be used as a guide for scientists, manufacturers, installers and investors."

Low-voltage switchgear

ABB NeoGear low-voltage switchgear has laminated bus plate technology combined with digital capabilities.

The ABB Ability platform is said to offer better energy management, condition monitoring and predictive maintenance to reduce operational costs.

The laminated bus plate was put in place of the traditional horizontal and vertical busbar systems; an approach which is designed to improve safety. According to the company the product has up to a 25% smaller footprint, making it suitable for places where space is at a premium.

With a fully encapsulated and touchproof main current-carrying system, the switchgear should require fewer components.

ABB Australia Pty Ltd

www.abbaustralia.com.au

Backlit LED panels

Brilliant Backlit LED panels are low maintenance and offer practical lighting for offices, education facilities, as well as commercial and residential settings.

The LED panels are designed to offer better performance than sidelit panels; distribute a flicker-free, low-glare, uniform bright light; and provide higher efficiency at more than 100 lm/W.

Using a high-quality translucent diffuser eliminates the ripple effect across the panel, creating zero light leakage and preventing the light from turning yellow.

The Backlit panels are available in two common sizes: 1200 × 300 and 600 × 600 dimensions. Backlit panels can be fitted into standard, T-bar ceiling grids, as well as recessed plaster kits or surface mounting options, making them suitable for a variety of applications.

With a CCT Tricolour switch that enables users to change between warm white, cool white and daylight, it is possible to choose a suitable colour temperature for different applications.

Brilliant Lighting (Aust) Pty Ltd

www.brilliantlighting.com.au

Deep custom enclosures

COMBIMET is METCASE's 19″ rack case range, with applications including networking and communications, industrial computers, sound and studio electronics, laboratory instruments and control systems. The 28″ (711.2 mm) deep custom COMBIMET is METCASE's deepest 19″ rack case, designed to fit 1000 mm deep racks.

Standard COMBIMET enclosures have removable top, base and rear panels, offering full access to the PCBs. The top and base can be specified as either vented or unvented. Other features include ergonomic front panel handles and mounting holes for PCBs and chassis. M4 earth studs on all components ensure electrical continuity.

The 28″ deep custom COMBIMET cases are available in all heights from 1U to 6U and in any colour. Cases are supplied fully assembled.

All COMBIMET rack cases can be supplied fully customised. Services include CNC punching, folding, milling, drilling and tapping, fixings and inserts, painting and finishing, and digital printing of legends and logos.

ROLEC OKW Australia New Zealand P/L

www.metcase.com.au

Data centre cooling solution

The STULZ CyberWall data centre cooling solution is designed for operators of large, colocation and hyperscale data centres.

It comprises a range of precision air-conditioning units specifically developed for facilities with separate aisles. Its horizontal airflow technology enables operation of high IT load densities, without the use of raised floors or side coolers.

In order to protect equipment and offer a good level of cooling, CyberWall is configured around fan walls with electronically commutated (EC) fans and integrated air/water heat exchangers. This allows a cooling capacity of around 100 kW per metre of wall length to be achieved and means that the efficient air conditioning of high power densities, as well as racks of 42U or more, is now possible.

The product has been designed so that indoor air handlers with cold water connection can be mounted in rows or stacked without gaps — making use of all available wall space and optimising system performance. Mounted at the aisle end, where they supply individual rack rows horizontally with cold air, the warm aisle is separated by a containment system with a ceiling duct, so that separation of cold and warm air is created. The system also fits into the existing service corridor, which allows the maintenance of air conditioners to be completed without the need for personnel to enter the server area.

STULZ Australia Pty Ltd

www.stulz.com.au

Security camera range

The Panasonic U Series security camera range is designed to increase the safety and security of people in public places.

The range offers durability, including shock absorption around internal lenses, and good performance with a low risk of damage or being vandalised.

The cameras in the series include the WV-U2132L 2-megapixel iA (Intelligent Auto) H.265 Varifocal 'Indoor Dome' Camera, the WV-U2532L 2-megapixel iA H.265 Varifocal 'Outdoor Dome' Camera' and the WV-U1532L 2-megapixel iA H2.265 Varifocal 'Bullet' Camera.

Each of the cameras provides full HD 1080p at 30 fps and colour night vision (0.006 to 0.1 lx), and incorporates Super Dynamic 120 dB to ensure sharp and clear images during day or night. Auto speed shutter control enables the capture of high-quality images for fast-moving objects, even under the most challenging and dynamic of environments.

The Intelligent Auto (iA) technology ensures dynamic optimisation of key camera settings during day or night, by monitoring scene dynamics and motion and reducing distortion such as motion blur from moving objects.

Complementing these models are a range of fixed indoor and outdoor dome cameras, including the WV-U2130L 2-megapixel iA H.265 Fixed 'Indoor Dome' Camera and the WV-U2530L 2-megapixel iA H.265 Fixed 'Outdoor Dome' Camera.

Panasonic Australia Pty Limited

www.panasonic.com.au

Power supplies

Weidmuller PRO INSTA power supplies are compact and efficient, designed to ensure a long-lasting power supply for buildings and machines.

The power supplies are suitable for a variety of applications, including telecommunication and automation systems supporting power requirements up to 96 W.

Weidmuller Pty Ltd

www.weidmuller.com.au

SMART TECH
MINIMISES POWER OUTAGES IN HOMES

Smart technology that allows utility companies to better serve dwellings and communities affected by power outages has been designed by researchers at Texas A&M University.

The device works by improving energy delivery between home solar-power systems and the electrical grid.

"Our innovation lets solar energy consumers be less dependent on the external power grid. The same technology also allows the utility company to control energy distribution, which is particularly useful during power outages caused by storms and other natural disasters," said Dr Le Xie, professor in the Department of Electrical and Computer Engineering.

"So, it's a win-win scenario for both the consumer and the utility company."

The study was published online in the Institute of Electrical and Electronics *Engineers' Journal of Emerging and Selected Topics in Power Electronics* in April.

Over the last decade, a sharp drop in the cost of solar panels has encouraged more households to adopt solar power systems. In these homes, the current generated by rooftop solar panels is fed into an inverter before the electricity is ready for residential use and charging solar backup batteries. Another set of power electronics connects the solar panels and the batteries back to the grid.

©Stockphoto.com/Baris Simsek

These connections ensure that homes are always connected to the grid as long as the grid is functional. During the day, homes consume more solar energy, and any excess energy is supplied to the grid. At night, homes draw electricity from the grid.

The researchers noted that these conventional systems have many disadvantages. Any voltage fluctuations in the grid, due to damage to the powerlines or overloading, affects connected devices in homes. Also, they said the current injected into the grid from solar-powered homes can have certain irregularities, known as harmonics, affecting the quality of the power within the grid.

The researchers said another pertinent problem is there is little that a utility company can do to limit the amount of grid electricity consumed by solar-powered homes. This drawback is particularly harmful during natural disasters where other communities or essential services, like hospitals, need energy support.

"Currently, there's no system in place to regulate or limit energy consumption," said Dr Prasad Enjeti, TI Professor III in Analog Engineering in the Department of Electrical and Computer Engineering.

"End users with solar-powered systems continue drawing electricity from the grid because utility companies have no way of controlling it."

Unlike the conventional solar-powered systems that involve many electronics to connect back and forth from the grid, the researchers put together a single device, called the power electronics intelligence at the network edge, or PINE. This device, which is installed outside a home, has three main connections: one going to the home, one to the utility grid and another to the solar panels and batteries. PINE can control the flow of electricity in any one of these directions.

"This device is like an intelligent energy router," Enjeti said.

"It regulates the grid voltage, integrates solar energy, which is locally produced, and intelligently manages and routes the energy in all directions."

The researchers designed this device to also be programmable, so that an authorised external user, like the utility company, can control the amount of grid electricity reaching solar-powered homes. Enjeti said PINE systems installed at different homes can also be programmed to communicate with each other and with the distribution operator.

To test if the PINE networks will operate as envisioned, the researchers built a hardware prototype and conducted extensive computer simulations of a mixed neighbourhood in which some homes had PINE systems and others did not. The hardware performance along with simulations revealed that the homes with the PINE system had a cleaner, more stable voltage. At the grid level, the injected voltage from these homes was also stable because the PINE system was regulating that as well.

"PINE systems can dynamically and in real time inject different voltage support to the utility grid. So, the utility companies need not spend millions in buying capacitor banks to support the voltage across the feeder lines," Xie said.

"During power outages, PINE allows homes to be self-sufficient and use their solar power efficiently. The technology also allows the utility company to wirelessly instruct PINE systems to limit the grid current to solar-powered homes and redirect it to other affected areas."

Stainless steel industrial enclosures

The EJSS family of enclosures from Hammond Electronics is available in 304 or 316 grade stainless steel, supplied in a natural smooth brushed finish. Sealed to IP66, the series is designed for use as an instrument enclosure; an electric, hydraulic or pneumatic control housing; an electrical junction box; or a terminal wiring enclosure.

In applications such as food processing, a formed lip on the enclosure diverts flowing liquids and contaminants away from the seamless poured-in place gasket in the door, enabling it to be hosed down during cleaning. Stainless steel is also a suitable material for installation in areas where corrosion may be a problem.

The EJSS family is available in 22 sizes, ranging from 102 x 102 x 76 mm to 406 x 356 x 254 mm. All but the two smallest sizes are supplied complete with a 1.6 mm-thick internal unpainted galvanised steel panel. The series meets IEC 60529 IP66 for European and CE, UL and NEMA 3R, 4, 4X, 12 and 13 requirements for North American markets.

The body and cover are formed from 1.3 mm stainless steel with smooth, continuously welded seams without knockouts, cutouts or holes. Integral heavy-duty, full-width top and bottom brackets facilitate mounting the enclosure to an external surface. The cover, mounted on a heavy-duty continuous hinge, opens through 180° for good access; a quarter-turn latch prevents casual unauthorised access by requiring a tool for operation. A bonding stud is provided on the door and a grounding stud is fitted to the enclosure.

Hammond Electronics Pty Ltd
www.hammondmfg.com

Rackmount on-line UPS

The Vertiv Liebert GXT5 rackmount online UPS is designed to ensure availability within mission-critical small IT environments and edge locations that enable important emerging applications — such as 5G, virtual and augmented reality, and the Internet of Things.

The UPS has a power factor of 1.0 on all models, providing more real power for the user, and is more efficient in both online (up to 95%, according to the company) and Active ECO mode (up to 98%). All models are ENERGY STAR 2.0 certified, and are currently available in capacities from 750 VA to 10 kVA, 230 V.

The product offers a three-year full coverage factory warranty for the UPS and battery. The system also is available with the company's extended warranty and other service packages to support individual user needs.

Vertiv Co
www.vertivco.com

Smart PV solution

Trina Solar has introduced the TrinaPro Mega, an ultrahigh-power smart PV solution featuring modules with power output exceeding 500 W.

With further improvement in product selection and integrated design, the solution is designed to enhance the overall system performance and reduce the levelised cost of energy (LCOE).

The product provides users with customised solutions to ensure system efficiency.

Trina Solar
www.trinasolar.com.au

Protocol analyser for PCIe 5.0

Component manufacturers need test platforms that will validate performance according to the PCIe 5.0 standard, while maintaining familiar user interfaces and management environments to minimise training needs and start-up costs. VIAVI Solutions has now introduced the Xgig 5P8 Analyzer Platform for PCIe 5.0, allowing equipment manufacturers to ensure performance in accordance with the latest revision of the ubiquitous serial computer expansion bus standard.

The product provides protocol analysis for PCIe 5.0 traffic at all layers of the protocol stack. It supports link widths up to eight lanes and link speeds to 32 GT/s, and provides both PCIe and NVMe protocol analysis functions as well as full downward compatibility to PCIe 4.0. It also connects with other VIAVI analysers designed for protocols such as Ethernet, SAS and FC to provide time correlated multiprotocol views.

The product chassis has 128 GB of memory and flexible allocation to capture and save multiple data traces. The chassis provides advanced PCIe and NVMe level trigger and search capabilities designed to speed debug and problem resolution time. Interposer autotuning should simplify and speed up system use, as well as enable repeatable capture results.

VIAVI Solutions Inc
www.viavisolutions.com.au

CASE STUDY

100% green power for City of Sydney

The City of Sydney was 100% powered by renewable energy from July 2020.

This renewable power is generated from wind and solar farms in regional NSW.

Valued at over $60 million, it is one of the biggest green energy deals of its kind by a council in Australia.

All the City's operations — including street lights, pools, sports fields, depots, buildings and the historic Sydney Town Hall — will now be run on 100% renewable electricity from locally sourced clean energy.

The switch is projected to save the City up to half a million dollars a year over the next 10 years, and reduce CO_2 emissions by around 20,000 tonnes a year — equivalent to the power consumption of more than 6000 households.

Lord Mayor Clover Moore said the new agreement will generate jobs, support communities impacted by the COVID-19 pandemic and create new opportunities in drought-affected regional NSW.

"We are in the middle of a climate emergency. If we are to reduce emissions and grow the green power sector, all levels of government must urgently transition to renewable energy," Moore said.

"Cities are responsible for 70% of greenhouse gas emissions worldwide, so it is critical that we take effective and evidence-based climate actions.

"The City of Sydney became carbon neutral in 2007, and were the first government in Australia to be certified carbon neutral in 2011. This new deal will see us reach our 2030 target of reducing emissions by 70% by 2024, six years early.

"This groundbreaking $60 million renewable electricity deal will also save our ratepayers money and support regional jobs in wind and solar farms in Glen Innes, Wagga Wagga and the Shoalhaven."

The innovative green electricity deal is a power purchase agreement with retailer Flow Power. CEO Matthew van der Linden said the City's commitment to achieving 100% renewable energy would help accelerate Australia's transition to a net-zero carbon future.

"This is a landmark achievement for the City of Sydney. If organisations can follow in the City's footsteps, a net-zero carbon future is achievable," van der Linden said.

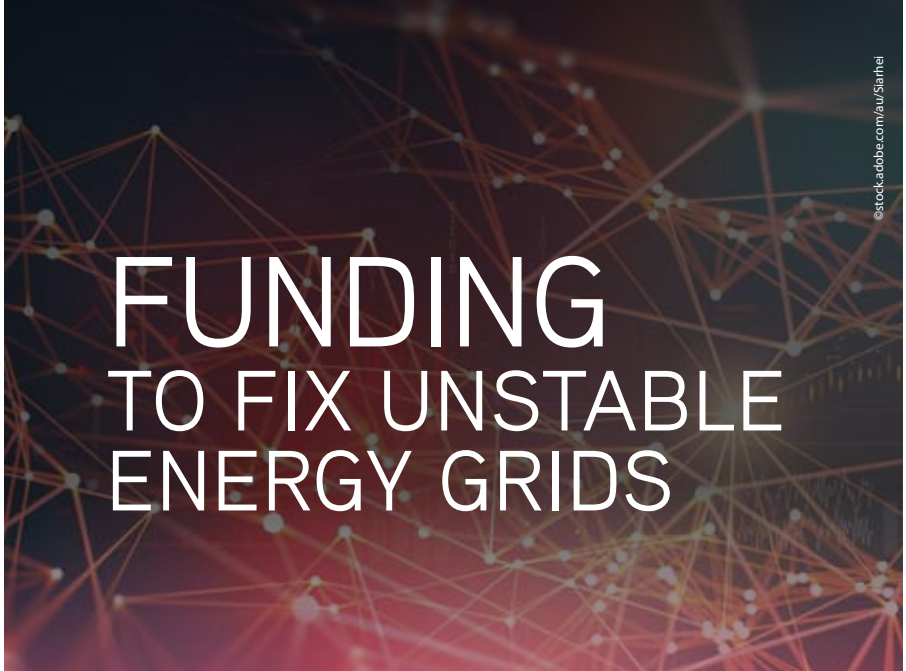
Around three-quarters of the power will be wind generated, and the remaining quarter by solar.

The project will see the City source renewable energy from three different generators — the Bomen Solar Farm in Wagga Wagga, Sapphire Wind Farm near Inverell and the Shoalhaven solar farm in Nowra.

The Shoalhaven project is being developed by Flow Power in partnership with local community group Repower Shoalhaven, a not-for-profit volunteer community enterprise that develops community solar projects. On completion, the 3-megawatt Shoalhaven solar farm will have around 10,000 panels and generate enough energy to power 1500 homes.

Owned by Australian-listed company Spark Infrastructure the 120 MW Bomen Solar Farm has more than 310,000 solar panels on 250 hectares of land. It is one of the first projects in Australia to use bi-facial panels that absorb sunlight on both sides, with tracking technology that shifts each panel throughout the day to capture the sun's energy.

The Sapphire Wind Farm near Inverell is the largest wind farm in NSW, with a 270 MW capacity generated by 75 turbines that stand 200 metres high.



FUNDING TO FIX UNSTABLE ENERGY GRIDS

A study that will explore how to manage unstable and weak parts of the electricity grid has just received funding from the Australian Renewable Energy Agency (ARENA).

The Grid Innovation Hub at Monash University has received $495,680 in funding to conduct a desktop study that explores issues and strategies associated with connecting renewable energy technologies such as solar, wind and battery projects into weaker parts of the National Electricity Market (NEM).

The $1.3 million project will use the West Murray region of the North West Victorian network as a case study due to the region's current system stability challenges.

Outcomes and outputs from the study will be applicable to other renewable energy zones (REZs) across the NEM, such as the Central West Orana REZ in NSW.

The study is supported by stakeholders who will be providing in-kind support, including grid inverter technology provider ABB, the Australian Energy Market Operator (AEMO) and AusNet Services.

The study will survey grid stability issues and explore a variety of techniques to manage them, including the siting and operations of technology such as synchronous condensers, wind and solar farms, and battery systems incorporating advanced inverter systems. The project will facilitate enhanced understanding of weak grid areas, providing an opportunity for NEM stakeholders to understand and explore solutions to current and emerging issues.

Key outcomes of the study include aiming to improve the understanding of approaches to mitigate grid connection risk for renewable developers, increasing hosting capacity in weak networks, and supporting a greater understanding of power system security and reliability when operating with higher shares of renewable energy.

"Australia's power system is currently undergoing a major transformation with the rise in inverter-connected solar and wind. These renewable resources are typically located in weaker areas of the grid, causing stability issues," said ARENA CEO Darren Miller.

"Monash's study, while looking at North West Victoria, will aim to provide a solution for other renewable energy zones across Australia and help to increase the value delivered by renewable energy, reduce or remove barriers to renewables uptake, and help to increase the overall skills and capacity in this important area."

Dr Tony Marxsen, Chairman of the Grid Innovation Hub, said the goal is to explore new approaches to connecting large renewable energy sources to power Australia's future, from coast to coast, sustainably and affordably.

"Australia's renewable energy future will use decentralised energy sources in areas of high winds and lots of sunshine — and these areas tend to be remote from cities, where the grid is weak. Even with the strengthened interconnections foreseen in AEMO's Integrated System Plan, the problem of weak grids in remote areas will continue to challenge large renewable investments," he said.

Dr Behrooz Bahrani, Director of the Grid Innovation Hub, said, "This project should provide insights and possibly even pre-engineered solutions to ease the burden of grid stability and security, and speed up connection approvals."

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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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