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Balance of power

HOW CAN DATA CENTRES ADDRESS
THE AI ENERGY CONSUMPTION
CHALLENGE?

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▶ Given what we've experienced over the last few years, it would take someone very brave to second guess how 2025 will play out for the enterprise and data centre network infrastructure sector! That said, as we embark on the next stage of artificial intelligence (AI), there's a lot to be positive about but also some concerns that need to be addressed.

Perhaps the biggest issue is how the data centre sector is going to balance the increase in AI related energy consumption with legislative demands to become more sustainable. This appears, on the surface, to represent an invidious position that will no doubt be heavily scrutinised as demands increase to support the progress of AI technologies. In this issue's Question Time we've asked a specially selected panel of industry representatives to offer their thoughts on this particular conundrum.

A few years ago, some people were proclaiming that 'colocation is dead', but it is clear that this demise never happened. In fact, the opposite has transpired and analysts across the industry are predicting continued growth for the sector. In this month's special feature on colocation data centres. Adriaan Oosthoek of Portus Data Centers looks at the demand drivers for regional facilities, while Paul Finch of Kao Data looks at how cooling systems are being developed to ensure efficiency and sustainability demands are met in the age of high-powered chips.

While we are on the subject of once predicted demises that never happened (and are unlikely to!) this issue also contains a focus on copper cabling, with two excellent articles on the subject. In the first, Alberto Zucchinali of Siemon explains why the development of ever more intelligent buildings means that copper isn't going anywhere. He's followed by Panduit's Hans Obermillacher, who charts the evolution of copper cabling and examines its role in today's enterprises and data centres.

With lots more besides, I hope you enjoy this issue of Inside_Networks and if you'd like to comment on any of these subjects, or anything else, I'd be delighted to hear from you.

Rob Shepherd
Editor

Inside_Networks
THE NETWORK INFRASTRUCTURE E-MAGAZINE

Greater risk, poorer quality and increased costs as data centres battle mounting market pressure

88 per cent of UK data centres face increasing challenges due to growing market pressure, according to an independent Censuswide study commissioned by Keysource. More than 200 UK senior decision-makers within the IT and data centre sectors were polled, and the results were compared with findings from previous years.

Jon Healy

The relentless demand for faster delivery leaves data centres battling with greater risk (50 per cent), poorer quality (29 per cent) and increased costs (33 per cent) in day-to-day operations. Under this pressure, over three-quarters (78 per cent) of managers admit being required to overestimate their capacity, contributing to unnecessary wastage. Adding to the pressure, two thirds (66 per cent) of data centres expect their infrastructure to change over the next four years.

'The increased power requirements of widespread artificial intelligence (AI) use are catalysing a focus on heightened power capability, speed and resilience for data centres,' stated Jon Healy, chief operating officer at Keysource. 'The dynamic of data centres overestimating capacity, while unsurprising given the high demand, is resulting in costly waste and needs addressing. Data centre decision makers must take advantage of innovative optimisation techniques, from location, initial build or stack configuration through to more effective cooling methods.'

Alongside market challenges, 40 per cent of respondents affirm they do not possess the necessary skills required for modern demand. Four in 10 report a lack of available talent as the most significant blocker to solving the current skills gap.

'The sector depends heavily on a skilled, mature workforce, and so it faces age-related biases that affect recruitment from both younger and older generations simultaneously,' added Rich Clifford, director of solutions at Keysource. 'As the skills gap shows no sign of slowing, and future demands threaten to widen it further, the sector must recognise the value of tapping into talent across all age groups. Failing to invest in younger talent or to upskill older generations impacts the accessibility to talent, drives hiring competition and perpetuates the reliance on outsourcing.'

Financial decisions toward climate positive progress also remain divisive. While over half (55 per cent) of data centre and IT teams have access to separate 'green' funds – up from 50 per cent in 2023 – 40 per cent of organisations still do not separate their budgets. Sustainability remains a leading factor on the sector's agenda. The industry's drive towards enhanced sustainability is closely aligned with regulatory reporting under the Energy Efficiency Directive (EED).

Jon Healy concluded, 'While an optimistic outlook is a strong indicator of net-zero's rising prioritisation, also evidenced by increasing rates of dedicated green funds, there is a need for greater standardisation across the sector. Data centres must move quickly to provide concrete evidence of sustainability progress, unifying efforts to invest in the innovations that can provide the most immediate impact.'

Electrotechnical Training and Careers Alliance aims to tackle skills shortage in Greater Manchester

Greater Manchester is launching a pioneering Electrotechnical Training and Careers Alliance. The first of its kind in the UK, it comprises electrical businesses, education providers, the Electrical Contractors' Association (ECA), Greater Manchester Chamber of Commerce, the Greater Manchester Combined Authority and GM Colleges.

Andrew Eldred

The aim of the Electrotechnical Training and Careers Alliance is to take meaningful action to strengthen local electrotechnical skills development and careers provision within the region. Andrew Eldred, chief operating officer at the ECA, which has led on the initiative for local employers, said, 'We and our members are delighted to be working in partnership with the Greater Manchester Combined Authority, Greater Manchester Chamber of Commerce, education providers of all kinds, and other electrical industry organisations. Together we can deliver for the region, for local people and for business.'

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72 per cent of data leaders fear failure to adopt AI will result in competitive disadvantage

Data leaders continue to face ongoing challenges with the rapid evolution of technology, as 74 per cent of organisations report they have implemented some artificial intelligence (AI) based solutions, yet only 33 per cent have embedded them across their companies.

The findings from Ataccama indicate blockers for AI adoption include data privacy and security concerns (43 per cent), high maintenance costs (37 per cent) and steep implementation costs (33 per cent). Despite this, the consequences of not implementing AI weigh heavily on 54 per cent of all respondents, with 72 per cent of data strategy decision-makers worrying it will cost them their competitive edge.

Mike McKee, chief executive officer at Ataccama, said, 'Having trustworthy data will enable organisations to use AI tools to accelerate outcomes like operational efficiency, customer service innovation and competitive differentiation, and transform external forces like regulatory compliance into strategic advantages. For this reason, data trust is not just the foundation of successful AI implementation, it's the engine that supports thriving, future-ready businesses.'

Mike McKee

Electrical businesses brace for project delays in 2025

The latest Building Engineering Business Survey (BEBS) has revealed that 63 per cent of electrotechnical and engineering services businesses are worried about delays to projects and the impact this can have on cashflow. The survey, conducted by the Electrical Contractors' Association (ECA) in partnership with BESA, SELECT and SNIPEF, and sponsored by Scolmore, also showed that almost a quarter (23 per cent) of respondents expected their business' performance to have worsened by the end of 2024 – a figure which has risen by seven per cent since the last survey.

ECA director of legal and business, Rob Driscoll, said, 'Whilst staff shortages remain a concern, in 2025 we may see a big impact from delays to projects, which invariably leads to claims and disputes over the cost of completion and final payments. In a market where small to medium sized enterprises (SMEs) are paid in arrears as projects progress, business owners should focus on their resilience and ability to withstand cashflow turbulence given the propensity of clients to store disputes up until the resolution of the final account.'

Rob Driscoll

High-tech businesses taking 15 per cent longer to recover from cybersecurity incidents than expected

Research from Fastly has highlighted a rise in the time it takes businesses in high-tech to recover from cyber incidents. In 2024, businesses reported taking an average of 7.1 months to recover from cybersecurity breaches – 15 per cent longer than expected and almost one month past the anticipated timeline of 6.2 months.

With attacks becoming more prevalent and taking longer to recover from, Fastly found that 91 per cent of businesses in high-tech plan to increase investment in security tools over the next 12 months – a 15 per cent year-on-year rise. However, despite the additional spending, 48 per cent of the surveyed cybersecurity decision makers feel that an increasingly sophisticated threat landscape has still left them unprepared to deal with future attacks.

Marshall Erwin, chief information security officer at Fastly, commented, 'Full recovery from breaches is not getting any faster. The revenue, reputation and time lost damages business relationships permanently and drains resources from other areas of the business. With attacks not diminishing and the possibility of further high-profile slip-ups always present, it's crucial that any changes businesses are now making to cybersecurity strategies fit within a holistic plan and aren't knee-jerk reactions.'

Marshall Erwin

Schneider Electric research forecasts AI's impact on energy consumption

Schneider Electric Sustainability Research Institute (SRI) has defined four possible scenarios for artificial intelligence (AI) related electricity consumption over the next decade. These scenarios, which are not predictions but rather tools to understand the complex factors shaping our future, span possibilities from sustainable AI development to limits to growth, including scenarios such as abundance without boundaries and even energy crises caused by AI.

The company has also investigated how AI-powered heating, ventilation and air-conditioning (HVAC) systems can

Vincent Petit

enhance energy efficiency and environmental conservation in buildings. The study examined over 87 educational properties in Stockholm, Sweden, over an extended period under real-world conditions. Between 2019 and 2023, the study observed a total carbon emission reduction of 65tCO2e/y, roughly 60 times the actual embodied carbon footprint of the AI system deployed.

'The release of this information comes at a crucial time,' stated Vincent Petit, climate and energy transition research senior vice president at Schneider Electric. 'As a company and as researchers, we are committed to keep shaping the future of energy and climate solutions.'

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NEWS IN BRIEF

85 per cent of UK business leaders feel that their productivity efforts are being held back, according to research from Celonis. Carried out with 500 UK business decision makers, the research found that this group believes that better support for AI implementation (39 per cent) would be more beneficial for the UK's economic growth than reducing red tape (36 per cent) or cutting business tax rates (35 per cent).

AVK and Rolls-Royce marked a record-breaking year in 2024, delivering over 500 hydrotreated vegetable oil (HVO) powered MTU generators, equating to 1.3GW of standby power for data centres and critical industries.

Portus Data Centers has rebranded its European Data Hub (EDH) in Luxembourg to Portus Data Centers Luxembourg. At the same time the company has made an additional power increase that will bring the total IT load capacity to 3.4MW.

The London Internet Exchange (LINX) is marking 30 years of advancing the internet, with a continued focus on enhancing connectivity worldwide. Since its launch, LINX has grown into a critical hub for global internet traffic, increasing its connected network capacity from 60.10Tb/s in 2023 to 72.91Tb/s in 2024. On top of this, the network traffic being passed across LINX's global platforms continues to increase year on year. In 2024, LINX achieved its highest-ever network traffic, with a maximum peak of over 10.841Tb/s.

Take care of the penni

Hi Rob

It's a tough world out there and, as I write, I've just learned about a management company going under. Is this due to delays or situations where they simply cannot afford to run projects? I'm not sure, but I do know that the cost of living crisis continues to bite – the price of everything from food to components seems to have escalated. Energy costs also remain high, so every facility needs to save pennies where they can.

However, in the uninterruptible power supply (UPS) industry what doesn't work well is cutting corners to reduce costs. A UPS protects a critical load and choosing inferior equipment that is more likely to fail to save on upfront expenditure will never be an appropriate option. It puts the load at risk, not to mention the potential damage to the business through lost revenue due to power failures.

Conversations held early can remove headaches when it comes to budgets. Deploying an appropriate quality modular UPS configuration, which is both efficient and flexible to accommodate load changes, will save thousands of pounds over the long-term. This is because a correctly configured UPS system that is rightsized from day one is more efficient than an oversized system which costs more to run. These costs add up over time, so ensure you only buy what you need.

Choose a UPS system that will be flexible enough to enable you to pay as you grow. True modular UPS solutions are perfect for this purpose and we often advise clients to fit the inexpensive infrastructure and racks, then add UPS modules and capacity as the data centre grows. Carefully monitoring the load can ensure systems are always optimised and means modules can also be redeployed from a low area of use to a high demand area of the data centre if necessary, saving on future investment.

Training is often an area which is overlooked but it can also help reduce costs. For example, training can enable clients to monitor the performance of their UPS more closely to ensure it is always operating at the sweet spot of its efficiency curve. This saves energy and ongoing running costs. Informed clients can also take advantage of energy management modes, putting modules into hibernation to reduce running costs further as appropriate.

The most important point is to invest in the time to find the right people to advise about options and calculate total cost of ownership (TCO). The planning stage of any UPS installation is key to reducing TCO. Don't wait until the tender and get the thumbscrews out to try and achieve the

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will reduce the full TCO of a UPS system.

Ensure like-for-like comparisons about efficiency and energy use are calculated, and accurate quotes for maintenance and remedial repairs are included. Mean time before failure statistics and mean time to repair illustrations mean clients have a clear view of the future and can plan accordingly.

This is not always the case at the lower end of the market. The availability (uptime) of the system will be drastically reduced when poor quality components fail and cannot be replaced quickly, leaving the critical load at risk. System efficiency is usually significantly lower too, so ongoing running costs are increased.

Over the working life of a UPS it is better to invest in the best technology with a high operating efficiency and an excellent, cost-effective maintenance and training plan supported by experienced engineers than the alternatives that lack these benefits. Start conversations early and by looking after the pennies, over the long-term the pounds will look after themselves.

Louis McGarry
Centiel

Editor's comment
Making sure that every penny is well spent is more important than ever. As Louis makes clear, prioritising TCO when choosing a UPS supplier helps organisations avoid hidden costs, ensure uninterrupted operations and align investments with their strategic goals. This safeguards performance, while optimising financial and operational benefits over the system's lifespan.

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lowest capital expenditure at the expense of increased operational expenditure.

Work with your advisors to plan optimal power protection strategies right from the conceptual stage to develop flexible future proofed options that are designed to reduce TCO over the long-term. Then look at technical detailing, implementation plans and how training and experienced support can also reduce costs. I'm not just talking about new UPS installations here, but also replacement systems and servicing too. Upfront discussions with trusted advisors

Navigating the readine

Hi Rob

As someone deeply rooted in the networking and IT infrastructure business, I'm concerned about the recently revealed 'readiness paradox' facing today's leaders. Our recent Kyndryl Readiness Report found that while 90 per cent of telecoms leaders are confident their IT is best-in-class, 64 per cent worry their systems are outdated or nearing end-of-life. It's clear many doubt their businesses are ready for future threats.

The need for network modernisation is driven by a multitude of forces – rapid technology evolution, sophisticated cyberattacks, heightened competition, complex regulation and a critical artificial intelligence (AI) and cybersecurity skills gap. AI, for example, is transforming innovation and growth in the sector, which is why 73 per cent of telecom leaders are investing in it.

By leveraging AI, network management becomes more proactive. The result is an IT infrastructure that operates more efficiently, automates routine tasks and minimises downtime by anticipating problems. This ensures consistent performance for AI-driven applications, enhancing both operational reliability and the customer experience. Yet, traditional networks were not designed with AI's vast requirements in mind and, as businesses integrate AI more deeply, network modernisation becomes essential to meet the data and bandwidth demands of AI driven applications.

Deploying AI at the edge is one solution, processing data close to its source – such as in manufacturing plants, retail stores and healthcare facilities – reduces latency and enhances real time decision-making, all while optimising energy use. Of course, modernising infrastructure for AI is about more than performance, it requires robust security. AI applications handling sensitive data necessitate resilient cybersecurity, such as secure access service edge (SASE) models, to keep data safe across networks.
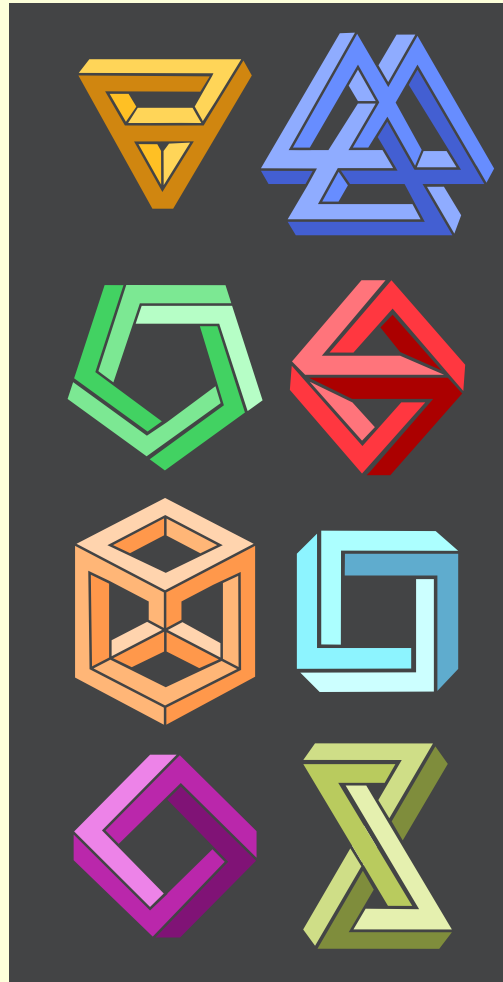
ss paradox

Protecting networks against 'harvest now, decrypt later' threats with technologies such as data centre interconnect networks is crucial, as quantum cyberthreats could compromise critical data.

Mainframes continue to be central to many enterprises' hybrid IT environments, with interest in using generative AI on the mainframe accelerating. Modernising mainframes with quantum-safe networks will be crucial as business leaders address complex technological, security and regulatory challenges.

To navigate the readiness paradox, government and industry must work together to foster innovation and resilience. Working with experienced technology partners to modernise and future-proof networks will be fundamental for businesses if they are to harness the power of AI and quantum technologies.

Paul Savill
Kyndryl

Editor's comment

As the world of AI accelerates, it's clear that some businesses are getting left behind and there is a disparity between how CEOs would like their IT systems to be and how they actually are. Many are experiencing technology skills gaps that hinder modernisation progress, while other barriers to AI adoption concern data privacy, a lack of defined return on investment and compliance challenges. There are tough decisions to be made but, as Paul makes clear, businesses need to act quickly to address their end-of-life technology challenges.

Quantum computing is another emerging disruptor which demands proactive action now. When fully operational, bad actors could use the speed and predictive capabilities of quantum systems to bypass traditional computing safeguards. This means quantum computers could break traditional encryption, posing serious risks.

Make sure you get it right first time

Centiel's Andrew Skelton explains the importance of practicalities in uninterruptible power supply (UPS) project design

When it comes to supporting customers looking to deploy a UPS solution to protect their critical load, a level of technical bias is required to advise and guide them through purchasing decisions to ensure they receive a solution that correctly meets their needs.

Having recently transitioned from operations to sales, my engineering and hands-on technical background equips me to ensure complex projects run smoothly. My career began with a four-year electrical apprenticeship installing equipment on-site, which has given me a deep understanding of what's needed to facilitate a smooth installation process, as well as the potential on-site challenges that can arise.

A common challenge is where a customer has an existing design that works on paper but will not work practically within the confines of a site. There may not be enough space, the cables may be too big or there is insufficient airflow in a room to cool equipment. I work closely with clients to ensure that UPS designs function practically and effectively in real-world conditions.

For data centres, sustainability and energy efficiency to reduce costs are key drivers. Here, rightsizing a UPS system is critical to ensure maximum efficiency. I'm able to recommend Centiel's multi-award-winning UPS solutions including StratusPower – our three phase, true modular UPS that delivers nine nines (99.9999999) availability, minimising system downtime and providing class leading 97.1 per cent online efficiency to minimise running costs.

The combination of our experienced team acting to advise customers on their best options based on facts and data, backed-up by our ability to supply industry leading UPS solutions known for their proven reliability, availability (uptime) and efficiency is a winning one. I'm now pleased to be supporting Centiel's customers with UPS solutions that work practically in the real world.

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Staying power

The rapid growth of artificial intelligence (AI) means that data centres will use more energy – at a time when they are being expected to reduce their consumption. Inside_Networks has assembled a panel of industry experts to examine this conundrum and look at whether AI itself could be part of the solution
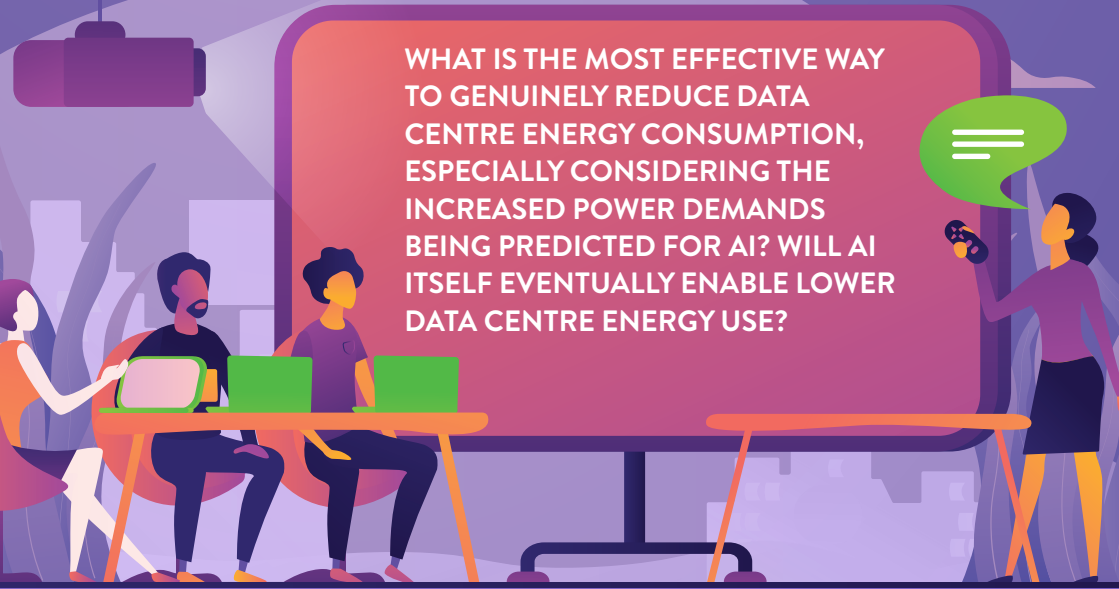
The increase in demand for data centre services, driven by AI and digital transformation generally, presents a significant power challenge. Companies in this space now face the critical task of evolving their energy strategies. This requires not only securing a reliable power supply but also aligning with political and social pressures to source energy that is both cost-effective and sustainable.

Great strides have been made to lower power use through energy-efficient hardware, optimised cooling systems and software driven resource management. For instance, graphics processing units (GPUs) that are specifically tuned for AI tasks can complete processes faster and consume less power per operation compared to central processing units (CPUs). Renewable energy sources are also firmly on the radar and the BCS 2024 Summer Report found that over the course of the next decade 86 per cent of respondents expect to see at least 90 per cent of their data centre energy usage sourced from renewable generation.

So, can data centres genuinely reduce their energy consumption or is AI simply going to increase demand exponentially? To assess the current situation, Inside_Networks has assembled a panel of industry experts to offer their opinions and discuss whether, in time, AI itself will be able to further decrease energy consumption through measures such as intelligent resource allocation and predictive maintenance.

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WHAT IS THE MOST EFFECTIVE WAY TO GENUINELY REDUCE DATA CENTRE ENERGY CONSUMPTION, ESPECIALLY CONSIDERING THE INCREASED POWER DEMANDS BEING PREDICTED FOR AI? WILL AI ITSELF EVENTUALLY ENABLE LOWER DATA CENTRE ENERGY USE?

EMMA FRYER
DIRECTOR OF PUBLIC POLICY EUROPE AT CYRUSONE

Regulatory efforts to reduce data centre energy consumption seek to improve efficiency. While this helps improve energy productivity and mop-up the laggards, there are shortcomings to this approach.

To reduce overall consumption, we must target the worst performing part of the sector, where there is market failure. Small, generally on-premise enterprise data centres and server rooms collectively add a significant, and unnecessary, energy burden but are out of scope of most instruments. The Energy Efficiency Directive (EED) exempts data centres below 500KW IT load, for instance. It seems that only those already motivated to improve efficiency are targeted.

We must also bring all power flowing through the system into scope. Power Usage Effectiveness (PUE) is the regulatory metric of choice, but only scrutinises infrastructure overhead, not IT load. And, as operators get more efficient, the proportion of energy in scope decreases. At a PUE of 5.0, 80 per cent of that energy is covered but at a PUE of 1.2, it's less than 17 per cent, so there are diminishing returns. Eventually, we will have to address the 1.

But an exclusive focus on efficiency can be counterproductive. Digital services are price elastic and their underlying infrastructure is energy intensive. Efficiency improvements, whether at processor or infrastructure level, make those services cheaper to deliver. As a result, demand increases – this is the Jevons Paradox, which was first identified in the 1800s. So how do we address it?

People talk of capping energy but then we would have to start thinking of allocations. In view of the economic activity underpinned by data centres and our dependence on them, the sector's power demand – estimated by the IEA as between 1-1.5 per cent of global electricity consumption – is surprisingly modest.

We could look at carbon productivity but that doesn't necessarily reduce consumption, and regulating to limit activity will simply drive it elsewhere unless the approach is global. Years ago, we tried to evaluate the net carbon reductions that the intelligent use of ICT can deliver across the wider economy. Should we revisit? If the quid pro quo is good enough, could this justify additional headroom for sector growth? Pragmatic but controversial. The jury is still out on the calculations and the system boundaries are devilishly tricky to set.

> 'YEARS AGO, WE TRIED TO EVALUATE THE NET CARBON REDUCTIONS THAT THE INTELLIGENT USE OF ICT CAN DELIVER ACROSS THE WIDER ECONOMY. SHOULD WE REVISIT?'

JOHN BOOTH
MANAGING DIRECTOR AT CARBON3IT

The most effective way to reduce energy consumption is to adopt the EU Code of Conduct for Data Centres (Energy Efficiency) (EUCOC) best practices. The latest version (15th Edition) can be found on the EU-JRC website and the 16th Edition will be published in March/April 2025. The best practices cover data centre utilisation, management and planning, ICT equipment and services, cooling, data centre power equipment, other data centre equipment, data centre building and, finally, monitoring.

The EUCOC is a strategic and cultural change tool that can be used in every organisation to reduce ICT spend in all areas of the business. Unfortunately, most organisations simply cherry-pick the best practices and, as such, do not get the results they require or envisaged. It is prudent to retain the services of an expert in the EUCOC to really get the desired outcome.

As for AI, legacy facilities are not going to be suitable for AI deployments due to the energy requirement and that means AI will need new data centres. These should be designed with EUCOC best practices, as well as the ISO/IEC 22237 or EN 50600 series of data centre design build and operate standards in mind.

I'm sure that AI can be used to reduce overall data centre energy use, and it will do this in variety of ways. It will facilitate some of the currently optional EUCOC best practices such as 4.1.12 control of equipment energy use, 4.2.8 IT equipment utilisation, 4.3.7 control of system energy use 5.2.6 dynamic control of building cooling, and a host of others.

It is refreshing to see that in terms of thought leadership and the direction of travel, how many of the EUCOC best practices were written prior to the explosion of AI. In my mind it proves that the EUCOC is an exceptional piece of work and should be used more widely. Perhaps the EUCOC being cited in EU legislation and, potentially, in the UK, combined with the growth of AI, may lead to a better understanding of and accelerate the use of the EUCOC best practices in the future.

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'THE EUCOC IS A STRATEGIC AND CULTURAL CHANGE TOOL THAT CAN BE USED IN EVERY ORGANISATION TO REDUCE ICT SPEND IN ALL AREAS OF THE BUSINESS. UNFORTUNATELY, MOST ORGANISATIONS SIMPLY CHERRY-PICK THE BEST PRACTICES AND, AS SUCH, DO NOT GET THE RESULTS THEY REQUIRE OR ENVISAGED.'

MARK YEELES

VICE PRESIDENT SECURE POWER DIVISION AT SCHNEIDER ELECTRIC UK&I

Gartner projects that by 2027 power shortages will restrict 40 per cent of AI data centres. However, with a multifaceted approach and businesses having forward-thinking strategies to optimise power consumption and energy efficient infrastructures, there are ways to effectively reduce power consumption.

Implementing energy efficient hardware technologies – including highly efficient cooling systems and uninterruptible power supplies (UPS) – is another way to further minimise power consumption. Using digital twin technologies to model and test the data centre under various conditions will not only help improve the energy efficiency of a facility but help to reduce its embodied carbon.

Building data centres near renewable energy developments is also key. This allows organisations to directly use clean energy, while encouraging investments in renewable energy developments to take place at the same time as new data centre buildouts. Additionally, utilising microgrid technologies can enable data centres to operate independently of the grid by generating their own green power, becoming prosumers and ensuring a more sustainable, resilient and efficient operation. These smart energy management solutions can also encourage greater collaboration between local utilities to help balance grid demand and reduce reliance on fossil fuels.

AI has the potential to lower data centre energy consumption, but there will be short-term pain, as demands increase to support the progress of AI technologies. However, as AI workloads, chip technologies and data centre designs become more efficient, we'll see energy consumption begin to reduce.

AI is already helping organisations to become more efficient though. For example, AI-powered management systems can optimise energy usage by analysing patterns, predicting peak demand and making real-time adjustments to reduce energy waste within critical systems. These solutions can also improve cooling efficiencies by managing airflows and temperatures, and monitoring equipment to identify energy saving opportunities.

Schneider Electric predicts energy demands from AI workloads will triple by 2028, with AI compute growing from 4.3GW in 2023 to between 13.5GW and 18GW by 2028. However, AI's ability to enhance efficiency, productivity and optimise processes could lead to a net reduction in energy use over time. So, despite the current surge in power consumption, we expect AI to lead to increased efficiencies in time, making it a long-term solution for sustainable innovation.

> 'AI HAS THE POTENTIAL TO LOWER DATA CENTRE ENERGY CONSUMPTION, BUT THERE WILL BE SHORT-TERM PAIN.'

HellermannTyton
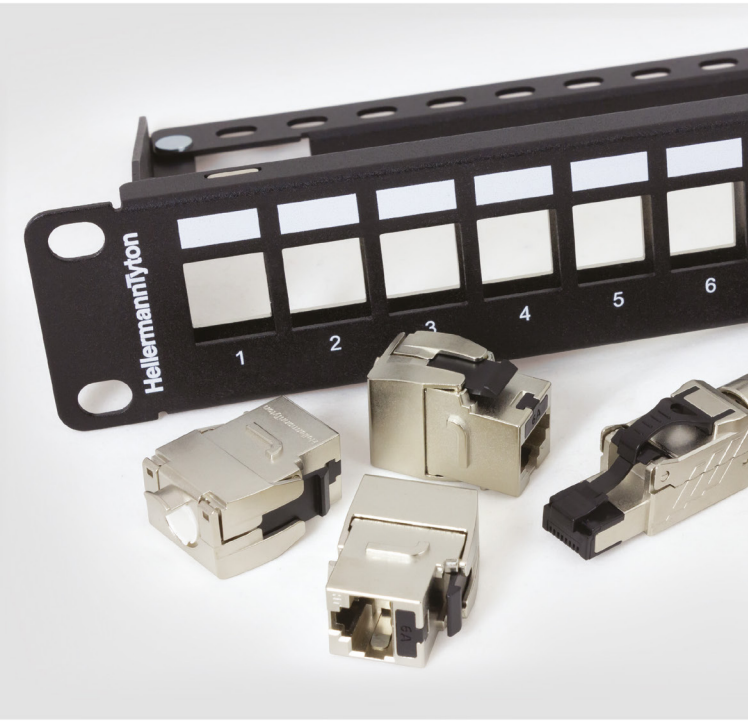
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MADE TO CONNECT

IN-AD-HTC-R13

MARK ACTON
MANAGING DIRECTOR AT ACTON CONSULTING

The best way to reduce overall energy consumption in data centres is to reduce the power consumption by the IT platforms hosted within them. This is true whether it is for AI platforms and applications or for more traditional compute. Current IT platforms are generally woefully inefficient, with low levels hardware utilisation, devices powered-up but doing no useful work, unnecessary equipment duplication and redundancy, applications and operating systems coded without any thought for energy efficiency or resource overhead etc.

Ultimately, we need to reduce the 1 in the Power Usage Effectiveness (PUE) metric, rather than focusing solely on the digits after the decimal point, as many (including legislators) seem intent on doing at the moment. A conspiracy theorist might even suggest that PUE was invented to hide or divert attention away from the lumbering IT inefficiency elephant lurking in the corner of every data centre hall!

Genuine reductions in data centre energy consumption therefore require a multi-pronged approach. Yes, of course, an ongoing reduction in the building overhead, but increasingly important are the initiatives to improve IT hardware energy efficiency and the growing demand for green software development. Let's also not forget the power used in networks – there are currently groups working on the energy consumption of subsea cables looking to introduce similar standardised key performance indicators to those we now have for data centres (ISO 30134).

Finally, using AI to manage AI is clearly a logical step. Tools that can optimise workload delivery in terms of energy efficiency across increasingly complex estates and that can manage and reduce the cooling required for hybrid and mixed density deployments using machine learning and AI are evidently the way forward.

Data centre management tools with these enhanced features not only understand the environment they are monitoring or the processes they are managing, but they are also capable of offering AI based intelligent insight and solutions for energy efficiency that humans cannot bring to the table. That approach and the use of these tools is clearly marking the way forward.

> 'A CONSPIRACY THEORIST MIGHT EVEN SUGGEST THAT PUE WAS INVENTED TO HIDE OR DIVERT ATTENTION AWAY FROM THE LUMBERING IT INEFFICIENCY ELEPHANT LURKING IN THE CORNER OF EVERY DATA CENTRE HALL!'

ADRIAAN OOSTHOEK
CHAIRMAN AT PORTUS DATA CENTERS

The energy efficiency of data centres has come a long way in the last 20 years, moving from an average Power Usage Effectiveness (PUE) of around 2.0, where every kW of IT usage was accompanied by another kW of ancillary – mainly cooling – energy usage. It is currently at 1.2 oreven lower.

Unfortunately, this is often achieved by using large amounts of water through adiabatic cooling. Whilst this reduces the usage of electricity, fresh clean water is a scarce resource in many places where data centres operate and therefore this technology should be avoided. However, there are still ways to improve without using vast amounts of water.

When operating temperatures in the data hall are higher than the ambient temperature, cooling can simply be achieved by using the colder ambient air. Free cooling works particularly well in colder and moderate climates.

Generally, the IT equipment is capable of handling it so the main hurdle to achieve this is for end customers is to accept higher operating temperatures. What naturally follows from this is picking a location with energy efficiency in mind – colder climes facilitate more efficient data centres.

Liquid cooling is a further solution. The main reason for the recent rise in adoption of this technology is that it addresses the much higher power densities required for most high-performance computing and AI deployments. However, cooling directly with liquid is also far more energy efficient than with air – the heat transfer efficiency difference is more than twentyfold.

Additionally, utilising waste heat, for example, in local district heating systems, indirectly contributes to reducing the environmental impact of data centres. The heat replaces the energy that would otherwise have to be generated through other means such as fossil fuels.

Furthermore, more focus should be put on the optimisation of IT infrastructure. Public clouds and other IT deployments are often overprovisioned to cater for peak loads quickly – but this also generates excess energy use by large amounts of IT kit standing idle.

AI will definitely increase the efficient energy use of IT infrastructure. We are also starting to see AI tools for optimising cooling infrastructures.

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'UTILISING WASTE HEAT, FOR EXAMPLE, IN LOCAL DISTRICT HEATING SYSTEMS, INDIRECTLY CONTRIBUTES TO REDUCING THE ENVIRONMENTAL IMPACT OF DATA CENTRES. THE HEAT REPLACES THE ENERGY THAT WOULD OTHERWISE HAVE TO BE GENERATED THROUGH OTHER MEANS SUCH AS FOSSIL FUELS.'

DEAN BOYLE
CEO AT EKKOSENSE

The only way to realistically reduce data centre energy use is to focus on cooling, as it accounts for around 35 per cent of overall data centre energy consumption. However, it's hard to secure meaningful energy savings unless you can see what is happening across all your facilities in real-time – how much power is being used by what and when. It is surprising how many data centre operators don't have the ability to see this.

While the latest digital services and AI applications may run on leading platforms, most IT teams have little interest in the underlying mechanical and electrical (M&E) infrastructure that provides the power and cooling that enables their services to run. With a typical building management system (BMS) view, most data centre teams only see their cooling unit temperatures. Rack inlet temperatures are largely unmonitored, meaning that their true status is effectively invisible.

EkkoSense research shows that only five per cent of M&E teams currently monitor and report equipment temperatures on a rack-by-rack basis, confirming that most data centre operations are in the dark when it comes to cooling performance optimisation. This lack of real-time insight into actual data centre cooling, power and capacity performance means that operations teams often over-cool because of this uncertainty. Because of this, it's not unusual to see expensive power and cooling resources being used inefficiently because they can't optimise inefficiencies they can't see!

Applying new levels of sensing can provide the core machine learning data needed to enable true real-time visibility of cooling, power and capacity performance. Using comprehensive 3D digital twin visualisations also allows information to be monitored and interpreted quickly. This helps in terms of highlighting potential cooling anomalies and displaying suggested airflow and cooling improvements – essentially making the invisible visible.

AI is already enabling lower data centre energy use. AI powered optimisation not only shows what's happening in terms of cooling energy use, but also why. AI and machine learning at this level changes data centre optimisation, taking all the complex datasets and crunching the numbers – doing in seconds what people previously would take weeks to attempt and most likely fail to achieve.

> 'AI IS ALREADY ENABLING LOWER DATA CENTRE ENERGY USE. AI POWERED OPTIMISATION NOT ONLY SHOWS WHAT'S HAPPENING IN TERMS OF COOLING ENERGY USE, BUT ALSO WHY.'

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Here to stay

Given that smart buildings need smart cabling, Alberto Zucchinali of Siemon explains why copper isn't going anywhere

▶ As the demand for cutting-edge smart buildings surges, the debate around network infrastructure often leans toward optical fibre as the presumed future, deeming copper cabling as less relevant. However, while fibre undoubtedly has its strengths, I believe that copper systems remain integral to smart building design. Far from being obsolete, copper infrastructure is evolving to meet new demands, proving to be more essential than ever. In applications where power and data need to be combined, copper is unmatched for flexibility, cost-efficiency and adaptability, and its versatility and reliability allow it to continue supporting an expanding array of smart building technologies.

LEADING THE WAY

From advancements in power over Ethernet (PoE) to innovations in Single Pair Ethernet (SPE), copper cabling is powering and connecting next generation applications. As smart buildings become more complex and interconnected, copper's ability to efficiently deliver both data and power over the same infrastructure offers unique advantages in deployment, energy savings and sustainability. The unique advantages of copper cabling can be seen across key smart building applications that demand both data transmission and power delivery.

• Building automation systems (BAS).
Copper systems provide a robust foundation for BAS, allowing seamless communication between the sensors, controllers and actuators that control essential systems like lighting, security, and heating, ventilation and air conditioning (HVAC).

• PoE lighting control.
Smart LED lighting powered by PoE uses copper cabling to enable precise, remote control over lighting intensity, colour and even schedules, contributing to significant energy savings and flexible lighting management in various environments.

• Security and surveillance.
Copper cabling's capacity to carry both data and power supports high-resolution IP cameras, enabling better security with simplified infrastructure. This reduces costs while improving safety and ease of monitoring in large-scale buildings.

• Access control systems.
From electronic access points to badge readers and biometric systems, copper cabling enables advanced security management without the need for complex, separate power systems, which streamlines deployment.

• Environmental monitoring.
Real-time tracking of air quality, humidity, temperature and occupancy depends on copper's reliable data transfer to central systems, offering actionable insights for better resource management.

Through PoE-enabled installations,

copper streamlines these smart building applications, creating an integrated, energy efficient set-up that not only supports diverse functionalities but does so sustainably and cost-effectively.

SIMPLIFYING CONNECTIVITY

PoE has emerged as one of the most transformative technologies in smart buildings, combining power and data over a single Ethernet cable. Originally limited to low-power devices, PoE's evolution now allows it to support higher-power applications such as digital signage, advanced lighting systems and complex internet of things (IoT) devices.

With the introduction of PoE+ and PoE++, delivering up to 100W of power, the potential applications have expanded considerably. By reducing the need for dedicated power sources, PoE lowers cabling costs and complexity, enabling devices like access points, IP cameras and lighting systems to be installed in more flexible locations. As PoE technology progresses, it is likely to support even more power intensive applications, strengthening copper's role as a future ready infrastructure choice in smart buildings.

DISTANCE LIMITATIONS

Traditionally, Ethernet cabling faces a 100m distance limitation due to signal degradation, presenting a challenge for larger installations. However, with innovations in cable materials and design, these limitations are being mitigated, allowing for extended reach without sacrificing signal quality.

Enhanced copper cables now support greater distances, reducing the need for repeaters or fibre optic replacements in larger facilities. This flexibility is vital in sprawling complexes and campuses, where the extended reach allows devices to be connected without the added cost of secondary equipment or extensive fibre infrastructure. Copper's adaptability thus ensures it remains economically viable while keeping up with performance demands.

EXPANDING REACH

SPE technology further extends copper's functionality, simplifying cabling for industrial, automotive and IoT applications where high data rates aren't essential but reliability and reach are. SPE's ability to transmit data and power over a single twisted pair of wires supports a range of low bandwidth, high-value applications such as sensors, access controls and environmental monitoring.

With support for up to 10Mb/s data rates over distances of up to 1,000m, SPE is ideal for space constrained environments where traditional Ethernet might be cumbersome. In industrial automation, building management and autonomous systems, SPE's streamlined cabling and reduced installation costs make it an attractive choice. SPE's ability to deliver data and power over data line (PoDL) also enhances energy efficiency, supporting a scalable

'Copper cabling's PoE capabilities are transforming traditional infrastructure layouts, allowing smart buildings to rely less on conventional telecom rooms. Instead, equipment consolidation points centralise data and power management, reducing the physical footprint of network infrastructure.'

approach to smart building technology.

ON THE RIGHT WAVELENGTH
In an age dominated by wireless connectivity, copper cabling still plays a foundational role. High-performance Category 6 and 6A cables facilitate fast, stable connections for Wi-Fi 6 and even emerging Wi-Fi 7 technologies, supporting greater data throughput in high-density environments.

The increased power capabilities of PoE enable these access points to operate without separate power supplies, simplifying installations and reducing clutter. As new Wi-Fi standards emerge, requiring higher data rates and reliability, copper's consistent performance and power capacity make it indispensable in Wi-Fi infrastructure, even as demand grows for faster and more reliable wireless networks.

ADVANCED DESIGNS
For advanced data rates and electromagnetic interference (EMI) resistance, Category 6A F/FTP cables are specifically engineered to support high-frequency transmissions, making them ideal for high-density smart building environments. These cables feature an advanced twist ratio and additional shielding, providing increased resistance to EMI and crosstalk, even over longer distances.

Category 6A's superior shielding and stable signal quality make it suitable for mission critical applications where data integrity is paramount. In environments with significant EMI, such as medical facilities or manufacturing plants, the reliable, high-speed connectivity offered by these advanced copper cables is invaluable for stable, high-performance networks.

MANAGING POWER LOSS
For effective PoE implementation, managing power loss over distance is key, especially in large-scale installations. Remote power (RP) RP1-RP3 ratings measure the efficiency of PoE cabling systems in terms of resistance to power loss. These ratings provide a framework for choosing cabling that meets the demands of specific smart building layouts:

- RP1: High power loss, suited for short runs.
- RP2: Moderate power loss, for medium distances.
- RP3: Low power loss, ideal for long runs, maximising efficiency.

For extensive installations, selecting the appropriate rating is crucial. RP3 rated cabling, with low power loss, ensures that energy reaches its destination efficiently over longer distances,
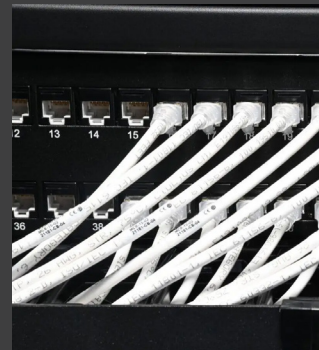
minimising operational costs and improving the sustainability of smart building infrastructure.

TIME AND LABOUR

Pre-terminated trunks simplify installations by arriving with connectors already in place. This approach is especially valuable in large projects where labour costs are high and installation times are tight. The consistency and quality control achieved with pre-terminated trunks also reduce potential connection errors, which can lead to troubleshooting and delays. For large-scale smart building projects, pre-terminated trunks offer a reliable, high-quality option that cuts down on time and expenses.

Copper cabling's PoE capabilities are transforming traditional infrastructure layouts, allowing smart buildings to rely less on conventional telecom rooms. Instead, equipment consolidation points centralise data and power management, reducing the physical footprint of network infrastructure. This approach lowers costs, simplifies maintenance and frees-up space, making it easier to upgrade systems as technology advances.

As PoE standards advance, copper is prepared to meet increasing power demands. While PoE++ currently supports up to 100W, the need for higher wattage will continue to grow with the rise of power intensive devices such as HVAC systems and complex IoT solutions. Copper cabling's potential to evolve with these power requirements reaffirms its essential role in future-ready smart buildings.

ENDURING RELEVANCE

The idea that copper cabling is a thing of the past overlooks its proven adaptability and integral role in powering smart building technology. From its compatibility with PoE to advancements in high-performance cabling and SPE, copper systems continue to be a crucial asset in meeting the connectivity and power needs of smart buildings. Far from being a legacy technology, copper remains an enduring foundation that will support the demands of smart infrastructure for years to come. ∎
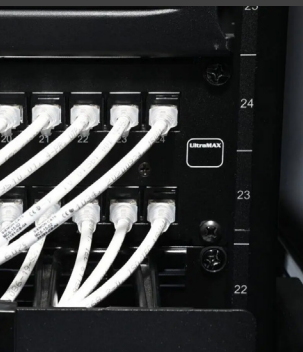
ALBERTO ZUCCHINALI
Alberto Zucchinali is solutions and services manager at Siemon. With over 20 years' experience in structured cabling, he has authored and presented numerous papers at worldwide industry conferences on various specialist subjects. Today he applies this learning to data centre infrastructure and designs network architecture for sites around the world.

Excel Networking Solutions

Excel Networking Solutions' copper cabling systems provide robust, high-performance solutions that support diverse networking needs, with sustainability at the core. The range includes cables across multiple categories, such as Category 7A, Category 6A and Category 6, offering options for both screened (F/UTP, S/FTP) and unscreened (U/UTP) solutions. These systems ensure exceptional transmission quality and adhere to industry standards, catering to environments from residential installations to data centres.

Key features include compliance with Construction Products Regulation (CPR) Euroclass classifications, comprehensive third-party verification and compatibility with Excel's end-to-end networking solutions. Additionally, pre-terminated assemblies simplify deployment, offering flexibility with connectors like jacks and plugs tailored to user requirements. Available in various lengths, colours and constructions, Excel's cables are built for reliability and scalability.

Backed by a 25-year warranty, Excel's copper cabling underscores a commitment to quality and innovation in structured cabling. **CLICK HERE** to view the full portfolio of Excel's copper cabling products or call the sales team on 0121 326 7557. **www.excel-networking.com**

Networks Centre

In early 2023, Luton & Dunstable Hospital began a site-wide redevelopment to make necessary improvements. Networks Centre had the opportunity to collaborate with GCIS on the first new build of the development, providing a range of high quality, bespoke Leviton and Prism DCS products.

Retrieving 4,500-5,000 data points of Category 6A B2ca copper cable at the right times proved to be a challenge early on, however, strong communication throughout the supply chain fuelled the success of the delivery. The project also required several cabinets with bespoke cable management at short notice.

With the help of Leviton's newly acquired enclosures and cable management specialist, Prism DCS, Networks Centre was able to assist with the specifications and short lead time. Thanks to effective collaboration from all involved, the project is on track to be handed over on time in early 2025.

Get in touch and let Networks Centre support your projects. **CLICK HERE** to send an email or call 01403 754233. **www.networkscentre.com**

n2s

From its UK-based state-of-the-art recycling facilities, n2s recovers and processes large quantities of IT equipment, cabling and printed circuit boards (PCBs). Aligned with the company's sustainability and zero to landfill principles, all materials from end-of-life devices and cabling are reintegrated into manufacturing streams for maximum circularity.

A recent major investment in advanced cable granulators provides n2s with the capability to process 3,000Mt of copper cable per annum. This includes network and power cable of all types and sizes recovered from telecom providers, on-premise and colocation data centres – from single core power cable, steel wire armour (SWA) cable to Category 5 and Category 6 copper cable. The n2s cable granulation service also extends to the recovery and recycling of unused drum-based excess stock.

For ensuring maximum return values, all copper is retrieved without any loss due to cross-contamination during processing. PVC sheathing finds new purpose in items such as traffic cones, fencing and rubber matting.

Environmental impact reports are provided to evidence a customer's progress towards sustainability in support of Scope 3.

CLICK HERE to discover more about n2s.
www.n2s.co.uk

Corning Optical Communications

Corning Optical Communications has enhanced its enterprise LAN and data centre copper portfolio with the launch of its Everon Copper Datacom Keystone Jacks.

The range comprises four copper jacks. They offer integrated self-closing dust shutters, failsafe connectivity, three-way cable entry for flexibility, compatibility with solid and stranded conductors, crosstalk protection, high port density options and compatibility with power over Ethernet (PoE) applications.

Easy to install and delivered in environmentally friendly bulk packaging, the jacks are available in Cat.6 and Cat.6A, in both shielded and unshielded variants.

For more information, including a webinar on how the products integrate with Corning's current portfolio, **CLICK HERE.**
www.corning.com
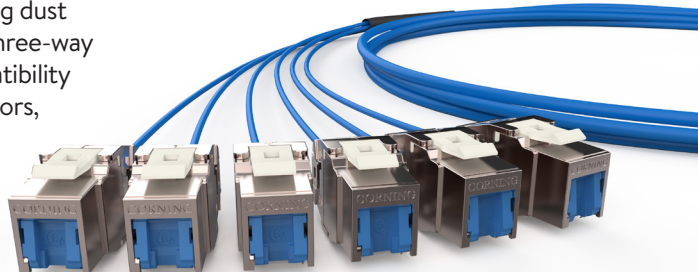
Front and centre

Panduit's Hans Obermillacher charts the evolution of copper cabling and examines its role in today's enterprises and data centres

▶ As technology evolves, so do the demands on data transmission infrastructure, particularly in enterprise and data centre environments. While optical fibre often takes the spotlight in high-speed data applications, copper cabling continues to hold a significant place due to its cost-effectiveness, reliability and versatility. The latest developments in copper technology indicate that it will remain a robust, adaptable choice for enterprise and data centre environments well into the future.

STATE OF PLAY

Copper cabling systems have evolved from supporting modest data rates to achieving high-speed Ethernet standards. Presently, Category 6A is one of the most widely adopted copper cabling solutions in enterprise networks due to its ability to support 10Gb/s data rates over standard 100m lengths. Its robust design provides a reliable foundation for extensive installations in both office and campus settings.

Copper cabling remains a strong choice due to several inherent benefits, which make it well-suited to the dynamic needs of modern enterprise and data centre networks:

• Cost efficiency. Copper is significantly more affordable than fibre in terms of

Worldwide Sales by type of category (channel), USD million

Source: BSRIA

installation and maintenance. For short-to-medium distances, particularly within buildings, copper cabling is the more economical option for achieving high-speed data transmission.

• Power over Ethernet (PoE) compatibility. Copper cabling is an enabler of PoE technologies, allowing network cables to transmit both power and data. This capability is integral for smart building applications, such 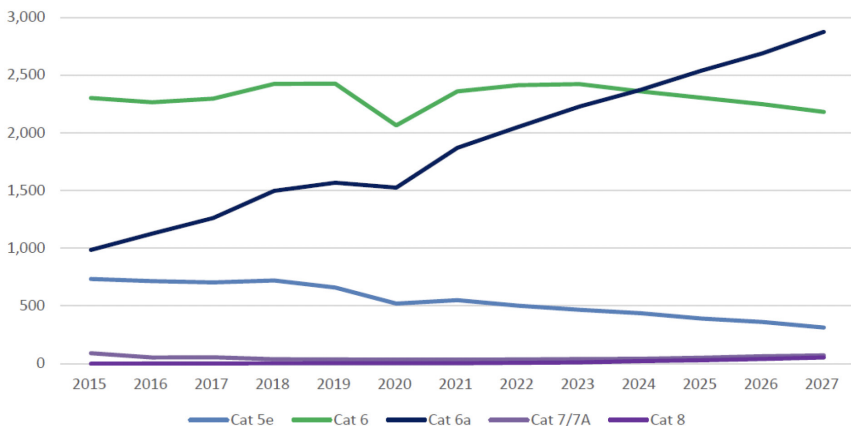as powering security cameras, lighting systems and wireless access points, and is a critical component of internet of things (IoT) focused enterprises.

• Ease of installation and maintenance. Copper cabling often requires less specialised handling than fibre, making it a more accessible solution for a broader range of technicians. Innovations in tool-less termination systems further simplify deployment and enhance installation efficiency.

These advantages ensure that copper remains a competitive and practical choice for network deployments, particularly in environments where cost control, ease of use and versatility are key considerations.

EXTENDED REACH
Recent advances have enhanced copper's potential reach and performance. For instance, 22AWG Category 6 or 6A cabling now enables reliable 1000BASE-T and PoE transmission over distances up to 150m – well beyond the standard 100m typically specified for Ethernet. This extension reduces the need for intermediate hardware for remote devices, allowing enterprises to minimise infrastructure complexity and costs.

Extended reach copper cabling is particularly relevant for large enterprise campuses or office complexes, where longer cable runs are essential. By reducing the frequency of repeaters or switches required to boost the signal, extended reach copper cables support more streamlined and efficient network architectures.

OPPORTUNITY KNOCKS
As data centres transition to support increasingly high-speed applications, the role of copper cabling will continue to be essential, particularly for short-range, high-throughput connections. Category 8 supports 25 and 40 Gigabit Ethernet
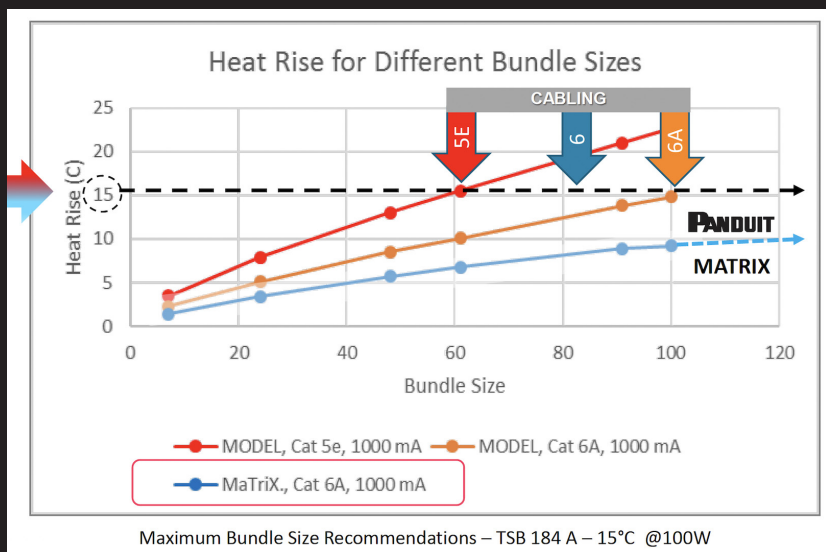
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Maximum Bundle Size Recommendations – TSB 184 A – 15°C @100W

'Copper cabling continues to demonstrate strong relevance for data centres and enterprise networks. Its advantages in cost, PoE support and ease of deployment make it a highly adaptable choice, particularly for environments that prioritise both performance and economy.'

over 30m distances, which aligns well with data centre configurations such as top of row (ToR) or end of row (EoR) set-ups. Category 8 was developed to be an ideal option for short-distance, high-speed connections, offering a cost-effective alternative to fibre for interconnecting racks and switches.

The ability to transmit data and power over the same cable has also positioned copper cabling as an indispensable component of smart buildings and data centres. The latest PoE standards, including PoE++ (IEEE 802.3bt), allow for power transmission up to 100W, enabling copper cabling to support more energy intensive applications. This has significant implications for IoT deployments, as it allows enterprises to power more devices through a simplified infrastructure.

PEAK PERFORMANCE
Enhanced thermal management capabilities in Category 6A copper cabling systems further optimise performance, enabling cables to handle higher power loads while maintaining safety and reliability. In data centres, where cooling and power efficiency are critical, copper cables designed with advanced shielding and thermal dissipation properties can operate efficiently under heavy PoE loads without compromising on performance or longevity.

Furthermore, data centre microgrids

- Mitigating alien crosstalk – All foil
- EMI immunity – **The barrier tape**

Continuous Barrier Tape

Discontinuous Barrier Tape Repeating Segment Length PD

Discontinuous Barrier Tape Varying Segment Length
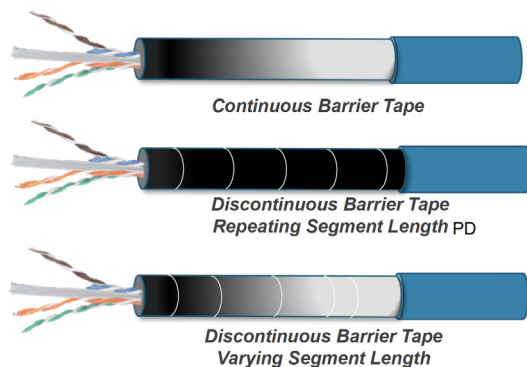
offer the potential to fundamentally alter the way in which power is delivered throughout a building. As most devices run off DC power, conversion loss from AC to DC wastes about 20 per cent of power within a building. Moving to a building to run off DC power sources such as PoE using Category 6 or 6A copper offers the ability to significantly reduce energy consumption.

GREEN IMPACT
The sustainability benefits of copper cabling are increasingly relevant in today's eco-conscious world. Compared to fibre, copper cabling can be more environmentally friendly in certain applications due to the ease of recycling and the generally lower energy

requirements for shorter cable runs. Furthermore, innovations in cable design, such as smaller diameters and advanced insulation, reduce material usage and improve energy efficiency by lowering power requirements for data transmission.

For enterprises focused on sustainability, copper cabling systems

tapes perform well

design matters!

- Susceptible to EMI - Antenna effect

- EMI performance much improved

- Best UTP EMI immunity

with low environmental impact and high recyclability present an appealing choice. Additionally, the longevity of copper-based infrastructure can reduce the frequency of upgrades, contributing to a lower overall environmental footprint. Environmental Product Declarations (EPDs) are readily available for many copper cables as well.

TREND SETTING
The IoT and edge computing are two trends reshaping network infrastructure. As more devices connect to networks and require local processing power, copper cabling will play a crucial role in supporting edge deployments. The flexibility of copper makes it suitable for edge environments, where PoE capabilities can power sensors, cameras and other smart devices without

the need for extensive electrical wiring.

Edge data centres, which are typically smaller and closer to end users, benefit from the high-density and scalable nature of copper cabling. With emerging PoE standards and improved power handling, copper cabling solutions can support IoT and edge networks effectively, enabling real-time data processing and reducing latency across a diverse array of connected devices.

ENDURING RELEVANCE
Copper cabling continues to demonstrate strong relevance for data centres and enterprise networks. Its advantages in cost, PoE support and ease of deployment make it a highly adaptable choice, particularly for environments that prioritise both performance and economy. With ongoing innovations and strong compatibility with emerging standards, copper cabling is poised to support the next generation of enterprise and data centre applications. ■

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HANS OBERMILLACHER
Hans Obermillacher is senior business development manager for data centres EMEA at Panduit. He has over 20 years' experience in the data centre industry.

Karl Bateson joins Centiel as UK key account manager

Centiel has appointed Karl Bateson as its UK key account manager. With 30 years' experience, Bateson will now support Centiel's customers across all areas in this newly created role. He joins Centiel from Kohler, where he spent 10 years as a sales manager, and he has also previously worked with other uninterruptible power supply (UPS) brands including Euro-Diesel and has extensive experience of working in the USA.

Louis McGarry, sales and marketing director at Centiel, commented, 'We are delighted to welcome Karl to our sales team. His extensive experience and technical UPS knowledge mean he's the perfect fit to provide continuity for our UK key account customers, supporting them with new project enquiries, upgrading their legacy equipment to the latest technology and managing their service needs.'

Bateson added, 'My new role is flexible and means I have the full scope to help customers solve whatever challenges they face. I am excited to join such an innovative company that is at the forefront of modular UPS development, and to be able to offer the highest quality UPS solutions to protect their critical power needs.'

L-R Karl Bateson and Louis McGarry

nLighten expands leadership team with key appointments in human resources and enabling services

nLighten has announced two additions to its leadership team. Samantha Wortelboer and Joachim van Collenburg have been appointed vice president of human resources and vice president of enabling services respectively.

Wortelboer will lead human resources across Europe, enhancing employee engagement and advancing the human resources framework to support the company's dynamic growth. Meanwhile, van Collenburg will lead nLighten's enabling services team, driving customer adoption for the nLighten Edge Data Center platform and advancing sustainability innovations. Additionally, he'll be responsible for managing nLighten's pre-sales solution architects team, which spans seven countries.

'As we expand our product portfolio and team across Europe, it is crucial to have seasoned leaders like Joachim and Samantha on board,' said Harro Beusker, founder and CEO at nLighten. 'Their expertise will drive our mission to provide sustainable and innovative infrastructure solutions.'

Harro Beusker

Huber+Suhner aims to reduce plastic bag usage through expanded sustainability project

All plug type attenuator solutions found in key Huber+Suhner product families will now be packaged in 100 per cent recyclable FSC-certified paper to ensure greater sustainability. Building off the announcement in 2024 to switch to paper packaging for indoor fibre optic cable assemblies, the decision to expand this project to cover plug type attenuators will replace over 40,000 plastic bags this year alone, with potential reductions of more than a million in the coming years.

Lana Ollier

'This expansion represents another step in our company-wide journey to drive sustainability in our operations and products,' said Huber+Suhner's head of global sustainability, Lana Ollier. 'In an industry still reliant on single use plastic, our initiatives reflect our overall commitment to sustainability to help fulfil our customers' growing demand for sustainable solutions. Going forward, we will also see additional product lines, including indoor fibre optic cable systems and harsh environment fibre optic cable assemblies, become part of this project.'
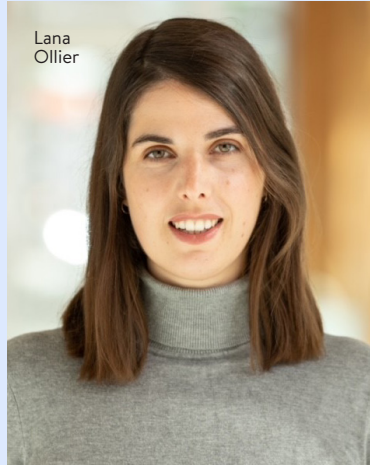
Schneider Electric appoints Nirupa Chander as senior vice president of its Secure Power & Data Centers operation

Schneider Electric has appointed Nirupa Chander as senior vice president international operations of its Secure Power & Data Centers business. In the role, Chander will lead a division of more than 700 professionals, supporting customers and partners across international zones in their digital transformation journeys and helping them achieve their sustainability goals.

Nirupa Chander

Beginning her career with India's largest industrial electrical company, Chander progressed from project engineering roles through project management, and country manager roles with major engineering firms such as ABB and Hitachi Energy, in Singapore and Australia. She joined Schneider Electric in 2022 as vice president of power systems for the Middle East and Africa.

Commenting on her appointment, Chander said, 'My experience with controls and automation brought me into IT infrastructure, showing me how energy and data are increasingly intertwined. Working on microgrids highlighted the complexity of balancing the grid with energy storage technology and renewables – insights now applicable to creating sustainable data centres.'

New n2s CEO puts focus on data centre equipment recovery and recycling

n2s has appointed Rob Bolton as its chief executive officer (CEO). With an extensive background in the engineering, recycling and manufacturing industries, Bolton previously served as n2s' operations director, successfully leading operational improvements and strategic growth over the past three years.

Rob Bolton

As n2s' CEO he is focused on maximising the expanding market opportunities for its core services encompassing technical sales, data centre decommissioning and copper cabling granulation. Additionally, he will oversee n2s' consumer IT device re-use and remarketing operations.

'I am excited to be leading our highly committed, talented and expanding team,' said Bolton. 'Together we will continue to set new standards for technology lifecycle management and IT asset disposal with secure, accountable and compliant solutions for equipment and cabling de-installation, data erasure, asset refurbishment and reuse, and sustainable zero to landfill end of life disposal.'

Allied Telesis brings back Chris Elliott to lead global partner expansion strategy

Chris Elliott has rejoined Allied Telesis as vice president partnerships and alliances, responsible for executing a strategic partner strategy for company expansion across Asia Pacific, North America, Central America and EMEA. Elliott is also tasked with managing the Northern European sales region including the UK, Nordics and Benelux.

Chris Elliott

'I am thrilled to get back in the Allied Telesis family, where I previously held sales management roles from 2016-2021,' said Elliot. 'I'm very much aligned with the company's culture and mission, and I know we are primed for aggressive global expansion. I'm excited to lead the channel team in that growth.'

The company has also announced a strategic partnership with GBE Converge. As an Allied Telesis Platinum Partner, GBE Converge will help increase access to Allied Telesis' award-winning connectivity and networking solutions for large business and enterprise customers across the UK and Ireland.

Kao Data names CBRE as its new data centre facilities management partner

Kao Data has appointed CBRE as its new integrated facilities management (FM) partner. CBRE was appointed for its global capability to support Kao Data's European platform expansion, and its exceptional reputation for managing hyperscale data centre and distributed real estate portfolios.

CBRE will be responsible for managing the complete spectrum of hard and soft FM services across Kao Data's advanced data centre portfolio. This includes all physical structures, mechanical, electrical, cooling and fire systems within its London data centres, as well as its new Greater Manchester facility, which is anticipated to become operational in 2026.

Pete Judson

CBRE's services will include ongoing maintenance and support for Kao Data's low-voltage and high-voltage electrical systems, including its uninterruptible power supplies, switchgear and generators, as well as its hybrid air and liquid cooling systems. Additionally, CBRE will be responsible for delivering a host of day-to-day, front of house FM services including management of security, access control and cleaning services across Kao Data's facilities.

'To ensure we continue to deliver best-in-class service and resiliency, appointing CBRE was the obvious choice,' said Pete Judson, chief operating officer (COO) at Kao Data. 'CBRE's reputation for continuous improvement and attention to detail, coupled with its consistently high standards of performance, make it the perfect FM ally.'

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CHANNEL UPDATE IN BRIEF

Nokia has announced a five-year expansion of its multi-year agreement to supply Microsoft Azure with data centre routers and switches. Nokia's data centre networking portfolio will enhance the scalability and reliability of Azure data centres around the world.

Mayflex recently achieved ISO 45001 certification for health and safety compliance.

Apatura has appointed former Google executive Michael Hunter to lead its UK data centre portfolio. As Apatura's head of commercial, Hunter will be responsible for establishing a portfolio of new data centre sites powered by renewable energy in the UK for use by hyperscalers and data centre operators.

Vantage Data Centers has appointed Christophe Strauven as its chief financial officer North America.

Node4 has appointed Richard Moseley as chief executive officer (CEO), with founder and previous CEO, Andy Gilbert, becoming president and board member.

Man of action

From starting out as a building services engineer, Paul Mellon has developed an enviable track record in delivering complex facilities management activities within mission critical environments. Rob Shepherd recently caught up with him to find out more about his life and career, and the what the future holds for the data centre sector

▶ **RS: Tell us a bit about yourself – who are you and what do you do?**

PM: As operations director for Stellium Datacenters in Newcastle, I have the task of planning the future requirements of traditional, high-performance computing (HPC) and artificial intelligence (AI) racks in terms of their power, cooling, accommodation, security and networks. I have an incredible team to support me on this journey.

RS: How and why did you decide to embark on a career in data centres?

PM: I started my career as a building services engineer, which established my core competence in engineering. This was followed by a period in running a facilities management company for a range of clients including data centres.

As I moved from a building services consulting engineer to facilities management, I found this to be a significant

and exciting step-change. I now sat in the buildings I previously had a role in designing and was tasked to operate them 24/7. Building teams in terms of electrical, heating, ventilation and air conditioning (HVAC) admin became fundamental and the 24/7 aspect of service is imbedded in my DNA!

RS: Is the battle for the energy efficient data centre being won and is it really possible to have a sustainable digital infrastructure?

PM: Emphatically yes. As an industry we have mobilised our combined efforts to bring the industry on this journey. This started several years ago with data centres being designed and built to deliver Power Usage Effectiveness (PUE) ratings of 1.2. The EU Code of Conduct for Data Centres (Energy Efficiency), Open Compute Project (OCP), EU Climate Neutral Data Centre Pact and iMasons have been instrumental in mobilising resources, setting targets and driving performance.

The OCP was/is the game-changer. It did not just create a new body of like-minded people, it created a whole new mindset. It pioneered the concept of sharing and has accelerated research and development (R&D). What previously evolved over years and decades is now telescoped into months and years. This brings to the market initiatives and ideas that are proven to deliver more robust and efficient performance in cooling at HPC level.

The incentive for legacy data centres to retrofit and upgrade was amplified by the energy crisis in 2022. The cost of energy at that time highlighted the inefficiency of many legacy data centres and inspired their upgrade to more efficient infrastructure and operations. In the same timescale we have seen a step-change in the industry created by HPC/AI.

Growth has been turbocharged with the explosion of AI development and graphics processing units (GPUs) being deployed as the core processor in AI. These market forces have accelerated the efficiency drive. We are also seeing the battle between immersion cooling and direct to chip chilled water cooling. We now know both initiatives are needed to support the industry and are highly efficient at driving PUEs to sub-1.2 and even sub-1.1.

In the same timescale we have seen the mobilisation of the circular economy.

> 'As more and more services move into the cloud, the drive towards predictive services, capacity management and predictive failure will increase. AI will contribute hugely to these elements.'

This is providing extended lifecycles for many IT platforms with end of life through the recycling of components and materials.

RS: What opportunities, and difficulties, is AI presenting?

PM: From a hosting perspective, HPC power density to support AI presents great challenges. It will demand rack power density from 30kW to 150kW plus. For a lot of existing air-cooled data centres, the challenges are considerable – much less data hall space is required and considerably more external engineering space is needed to accommodate the extra engineering plant.

On the cooling side there is a considerable shift to direct to chip cooling. What this means for existing data centres is a hybrid cooling solution of 66 per cent direct to chip and 33 per cent air. The power side is equally quite a challenge, as a 100kW rack will still require a dual diverse power supply. However, this requires up to three 63A three phase power supplies for each A&B service to each rack.

As more and more services move into the cloud, the drive towards predictive services, capacity management and predictive failure will increase. AI will contribute hugely to these elements. On the frontline it will assist data centre teams to focus on predictive elements of maintenance and operations. It may impact in a small way on the technical teams, with the creation of

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'Failure is inevitable. The challenge is to be prepared for it in whatever form it presents itself, be that human or technical. I have always embedded in my teams the business continuity management process.'

new roles.

The slow growth in the last few years of digital twins will most likely accelerate with the assistance of AI. The concept of digital twins lends itself to a more dynamic environment created by AI deployments in data halls. This will be a vital tool for data centre operators to monitor and manage more effectively the temperature in their HPC environments.

RS: Are small modular reactors (SMRs) the answer to providing data centres with the low-carbon energy needed to address the workload challenges of AI?

PM: These units originated in the USA in modules of 20-30MW but, at the moment, they do not have a track record. A lot of countries in Europe have had a programme to decommission their existing nuclear power stations.

Some have continued with this programme since the war in Ukraine and others have started to reverse this process and commence development of their nuclear programme again. The hyperscale community has at least embraced the concept of deploying SMRs. As we accelerate towards our goal of zero carbon, I suspect we will need to look at all available power resources.

RS: Is it time to move on from the PUE metric and is there a better way to measure a data centre's energy performance?

PM: PUE is 15 years old. It still serves as a useful metric and indicator but the whole discussion about environmental sustainability for data centres has moved on.

Today it translates into Scope 1 and 2 emissions with wider Scope 3 emissions soon to be mandatory. The latter is a game-changer – it's no longer just about power or water usage efficiency and emissions. It looks right across the supply chain including mitigating and offsetting the embodied carbon from data centre construction and even IT equipment. Purchasing, moving and disposing of IT all has an environmental cost and has a huge impact on an organisation's carbon footprint.

As initiatives such as district heat exchange and grid stabilisation become more established, PUE will become even less relevant. More holistic energy usage and emissions monitoring and measurement solutions will come to the fore to include the impacts of data centres producing energy for others.

RS: It's that crystal ball moment – how do you see the world of data centres developing over the next few years and what would you like to see happen?

PM: Increasing rack power densities from HPC and AI will make power and the proximity to power even more important. Over the last few years we have seen the migration to redundant power stations in Didcot and Leeds for hyperscalers to facilitate access to power at 100MW scale and above. This will continue and extend to the connections to national grid at points

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from 66kV and above.

The level of power required for HPC at scale will just not be available in commercial business parks at 33kV. By way of guidance, a 100-rack deployment at 100kW per rack equates to 10MW. That is/was the size of a data centre. By way of scale, hyperscale HPC deployments are planning for 100MW plus.

There will also be increasing demand and necessity for immersion liquid cooling. In the very short-term liquid cooling has provided a bridge to access HPC cooling. This gets off the shelf solutions to the hyperscalers and major AI vendors at HPC rack levels up to 150kW.

Currently, liquid cooling is beginning to top out at 200kW per rack. There are demands for much higher rack power levels than this but other cooling technologies like refrigerated gas will be needed for direct to chip cooling at the levels of 200kW plus per rack. It is an evolving space and the pace of development is staggering. This does not negate the use of immersion cooling, but the market has gravitated to the solution which keeps products, people and processes still relevant in the operating lifecycle of the deployment.

Though hyperscalers are leading the charge for more space, power and connectivity, large enterprise organisations are a further contributing factor to exploding data centre growth. As with the hyperscalers, they recognise that high-quality purpose designed and built colocation data centres offer many benefits versus the alternative of continuing to operate their own self-build/managed solutions. Increasingly, they are looking to deploy HPC workloads, which effectively require hyperscale class data centre solutions.

This is where standardisation and industry collaboration among technology vendors is already paying handsome dividends. For example, not too long ago a data centre, albeit a fairly small one, might be considered to be a cluster of 50-100 racks with a combined IT load of 100kW. A single rack can now accommodate 100kW in normal chilled water cooling and this scales to 250kW with immersive cooling. These developments represent giant steps forward in terms of efficiency.

The OCP has been at the centre of innovation, ensuring collaborative research and development is undertaken at such scale as to short circuit the development and standardisation process from decades to years – and sometimes months. What used to be the preserve of a small number of mainframe computers, high power density and cooling is now readily available at all levels in the data centre community.

Embracing renewable energy sources, such as solar and wind power will reduce our reliance on fossil fuels and minimise our carbon footprint. By incorporating sustainable energy solutions, organisations can contribute to a greener energy grid while enhancing sustainability credentials.

RS: What's the best piece of advice you've been given and how has it helped you during your career?

PM: Failure is inevitable. The challenge is to be prepared for it in whatever form it presents itself, be that human or technical. I have always embedded in my teams the business continuity management process.

Training for failure may seem a little strange but it is effective. It removes the potential of an event occurring at 2.00am on a Sunday morning into the daylight where you can analyse and test the support mechanisms in place to bring resolution. This tests your teams, your supply chain and potentially your clients. ∎

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Quick clicks

Your one click guide to the very best industry events, webinars, electronic literature, white papers, blogs and videos

GSMA's State Of Mobile Internet Connectivity report has found that the benefits of mobile internet have yet to be fully realised, as 3.45 billion people – or 43 per cent of the world's population – still do not use it. **CLICK HERE** to download a copy.

Kyndryl's Cyber Gauge 2024 report surveyed executives from over 600 large organisations to examine the disconnect in perceptions of cybersecurity. **CLICK HERE** to find out more.

Colt Technology Services has published its latest annual Digital Infrastructure Report, surveying 1,500 CIOs across 10 countries in the Americas, Asia, Europe and the Middle East. **CLICK HERE** to download a copy.

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The **Wireless Broadband Alliance (WBA)** has published its Wi-Fi Experience For Moving Networks Report, which demonstrates how the latest Wi-Fi standards can enhance moving networks. **CLICK HERE** to download a copy.

The Future Of High-Speed Ethernet Across Data Center, Telecom And Enterprise Networking is a report by **Spirent.** **CLICK HERE** to download a copy.

Singlemode Fiber (SMF) vs Multimode Fiber (MMF): Choosing The Right Optical Fiber Cable For Your Network is a blog from **AFL.** **CLICK HERE** to read it.

The **Salesforce** Slack Workforce Index has revealed that AI adoption is slowing among global desk workers, as half of workers report feeling uncomfortable admitting to their manager that they have used it for common workplace tasks. **CLICK HERE** to find out more.

Theory of evolution

Colocation data centres have become the artificial intelligence (AI) factories of the future, but with heat and energy demands increasing from high-powered chips, how will cooling systems develop to ensure efficiency and sustainability demands can be met? Paul Finch of Kao Data offers an answer

▶ The era of generative AI (GenAI) is upon us. According to JLL, it is among the top three technologies expected to have the biggest impact on real estate, having reached record investments of up to $4bn in AI-powered property technologies in 2022. Its 2024 report also found that AI energy demands – ranging from 300-500+MW – will require a plethora of more energy efficient data centre designs.

NUMBER CRUNCHING
From an industry perspective, the numbers are staggering. Analysts at TD Cowen have stated the AI wave has led to approximately 2.1GW of US data centre leases, while CBRE's European Real Estate Market Outlook 2024 found that data centre providers will see an uptick in requests for capacity related to AI requirements, with most of these expected to come from service providers and AI start-ups, as opposed to members of the hyperscale and cloud communities.

Now, as AI descends into all aspects of technology products, services and solutions, many are asking if the data centre industry is truly ready to accommodate its requirements? The answer for many colocation operators is no.

COOL IT DOWN
Nvidia is estimated to be responsible for over 95 per cent of machine learning workloads and remains the dominant manufacturer of graphics processing unit (GPU) accelerated technologies. In 2023, the company shared news it had won a $5m grant to rearchitect the data centre landscape and build an advanced liquid cooling system to address many of the challenges that legacy data centres, including on-premise, enterprise and older colocation facilities, are facing.

Funded by the US Department of

Energy, the CoolerChips program was positioned as one of the most ambitious projects the industry has ever seen. This is at a time where processor heat and power capabilities are soaring as Moore's Law and data centre designs reach their physical limits.

The anticipation is that soon traditional air-cooled data centre technologies may become obsolete, especially as AI adoption and supercomputing advancements gather pace, and that Nvidia's cooling system could cost approximately five per cent less and run up-to 20 per cent more efficiently than air-cooled approaches. It also expects that cooling technologies may begin to reach their limitations, as heat loads of more than 40W per square centimetre will face significant challenges in future.

POWER RANGER

This is no wonder, with the latest Nvidia SuperPOD packing up-to eight Nvidia H100 GPUs per system, and all connected by Nvidia NVLink. Each DGX H100 is expected to provide up-to 32 petaflops of AI performance, around six-times more than its predecessor the DGX A100, which was already placing limits on traditional data centre capabilities.

To add further context from a design and energy standpoint, an Nvidia SuperPOD can include up-to 32 DGX H100 systems with the associated InfiniBand connectivity infrastructure drawing up-to 40.8kW of power per rack. By today's standards, that's an incredible amount of processing power and AI capability, but rack and power densities are now expected to further increase.

'The future for GenAI is, of course, both exciting and unknown, but if Moore's Law is now reaching its physical limits all roads lead towards liquid cooling as the only viable option for GPU powered compute.'

Nvidia's new Blackwell GPUs, for example, are also set to enable businesses to build and run real-time GenAI applications and large language models at up to 25 times less cost and energy consumption than its predecessor, paving a new path for data centres engineered for AI. The question remains, how will data centres need to evolve to accommodate the cooling requirements of AI and which organisations will be the winners in the race?

DIFFERENT STROKES

The discussion around cooling methodologies remains divisive. In one camp are those who advocate for air-cooled systems and recognise the benefits of free air-cooling over that of a liquid cooled approach – one which often requires a major investment in capital expenditure (CapEx) and a retrofit of a legacy data centre architecture. In the other are the owners and operators already undertaking proof of concept (POC) projects and deploying hybrid or mixed cooling environments – those who are developing high performance infrastructure systems precision engineered to accommodate compute intensive applications on an industrial scale.

At Kao Data, for example, we've designed our data centres with hybrid cooling architectures as standard, including data halls that utilise the most energy efficient and environmentally sustainable air-cooling systems, but which can also accommodate direct-to-chip or direct liquid cooling as per the customers' requirement. This enables us to cater for organisations that require more traditional approaches to their hosted compute and to those seeking to provision for the forthcoming tranche of GPU powered compute.

LIQUID ASSET

For those embracing liquid cooling technology, the benefits are significant. Many of today's solutions leverage the higher thermal transfer properties of water and other fluids to cool high-density racks more efficiently and effectively than legacy measures. This is also reinforced by studies from organisations such as Iceotope and Meta, which confirm the practicality, efficiency and effectiveness of precision liquid cooling in meeting the cooling requirements of hyperscalers, where liquid cooling has gained something of a bias among members of the community.

With direct-to-chip liquid cooling, between 70-75 per cent of the heat generated by the rack equipment is removed via water with the remaining 25-30 per cent removed via air. Because direct-to-chip cooling is more effective from a heat transfer perspective, it is therefore able to support greater central processing unit (CPU) and GPU densities, while offering significant heat re-use capabilities.

Organisations within the sector have also predicted that liquid cooling can be up to 3,000 times more effective than using air. This all points towards liquid cooling having the potential to become the preferred cooling architecture of the future, and something which will be vital to meet data centre sustainability requirements.

ENGINEERED FOR AI

Data centre operators must lead with a culture of continuous innovation. Some have designed their high-performance data centre platforms to accommodate the next wave of AI applications with leading levels of efficiency. The future for GenAI is, of course, both exciting and unknown, but if Moore's Law is now reaching its physical limits all roads lead towards liquid cooling as the only viable option for GPU powered compute. ■

PAUL FINCH
Across his 30-year career, Paul Finch has held key senior roles at both CBRE and Digital Realty and he is now chief technology officer at Kao Data. In recent years he has been awarded Sustainability Champion and iMasons 100 Awards by the Infrastructure Masons and was presented by the president of ASHRAE with the Global Technology Award for Industrial Facilities and Processes for the outstanding achievement in the design and operation of energy efficient buildings relating to Kao Data's Harlow campus.

Portus Data Centers

Portus Data Centers operates a growing network of secure, state-of-the-art data centres in strategic regional locations in Germany and adjacent countries, offering future-proof capacity and excellent on-site engineering support. These facilities provide low latency regional colocation solutions to enterprise businesses and resilient edge infrastructure optimised for content distribution networks (CDNs), cloud and telecoms providers delivering high-speed services to local enterprises, government and other users.

Our vision is to become the preferred place for organisations looking to deploy digital infrastructure securely and efficiently – IT, connectivity or other services – in the general area of their place of business, whether to satisfy their own and their customers' needs, or to serve the local community of enterprises, government and other users.

The Portus portfolio presently comprises IPHH in Hamburg, Portus Data Centers Luxembourg and Portus Data Centers Munich. These are being continuously enhanced and expanded to meet and serve the growing demands of customers.

For more information **CLICK HERE.**
www.portusdatacenters.com

HellermannTyton

HellermannTyton has developed a full data centre connectivity solution, designed to offer high-density optical fibre capacity, excellent cable management and panel housing. Released in 2024, the all new RapidNet Ultra is a cassette based pre-terminated system that delivers a wide variety of options and flexibility when designing a data centre network.

RapidNet Ultra takes the existing data centre fibre solution beyond today's requirement. It offers an even greater fibre density while accommodating very small form factor connectivity and supports tomorrow's requirements for high bandwidth, advanced network architectures and Ultra Ethernet.

To support the RapidNet Ultra solution, HellermannTyton has also produced its Data Centre Cabling Guide, which is designed to help specifiers and data managers choose the best RapidNet system to achieve their network design. It covers everything from optical transceivers to polarity and data centre architecture and topology, assessing the key benefits and considerations at the design phase.

To complete the data centre solution, HellermannTyton can now offer a fibre duct raceway with the addition of a rack solution due to be released in 2025.

For more information **CLICK HERE.**
www.htdata.co.uk

n2s

With over 20 years of experience in managing the secure decommissioning of UK data centres, n2s takes a proactive role in meticulously planning and executing the removal of redundant and legacy data centre equipment, encompassing servers, switches, power distribution units (PDUs) and cabling.

Our highly skilled team provides asset survey reports, logistics support, on-site and off-site data destruction, server de-racking, removal of empty racks and cabling, as well as remarketing or ethical recycling – maximising value return to the customer. Ensuring data security is our priority through a range of on and off-site data security solutions including data erasure and/or physical destruction of hard disk drives (HDDs), solid state drives (SSDs), network devices and tapes.

Embracing the principles of a circular economy, we promote the reuse of products, components and the efficient recycling of scarce resources. During data centre decommissioning, we prioritise giving reusable equipment a second life and remain committed to zero landfill principles. At the end of each project, we provide our clients with environmental impact reports, to evidence their progress towards sustainability.

CLICK HERE to discover more about n2s.
www.n2s.co.uk

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Stellium Datacenters

One of the largest purpose-built data centre campuses in the UK, Stellium Datacenters' OCP Ready facility provides a highly connected and sustainable colocation option for Open Compute Project (OCP) project owners.

We offer the combined benefits of OCP compliance, a cool North of England climate, a location with the UK's lowest carbon intensity output rating, and 80MW of Renewable Energy Guarantees of Origin (REGO) certified power that is immediately available and scalable to 200MW plus within 24 months. It is a facility that has also achieved multiple data centre and ISO certifications.

Stellium's colocation services support high performance computing (HPC), artificial intelligence and machine learning workloads. We provide HPC cooling of client racks from 10kW to 100kW using in-row/rear door chilled water cooling, with mobilisation times of 4-14 weeks, depending on configuration.

Furthermore, our strategic collaboration with Submer and ExxonMobil enables Stellium to be one of the first colocation providers in the UK to offer fully immersive cooling up to 200kW per immersion tank.

To find out more **CLICK HERE.**
www.stelliumdc.com

Pulsant

Pulsant is the UK's most geographically diverse colocation provider, with 12 strategically located data centres interconnected by a high-performance private network. Our platformEDGE solution delivers secure, scalable infrastructure, ensuring your business critical systems are always available and ready to grow with your needs.

Benefit from a client-centric design that offers tailored racks, cages, power density and cooling options to suit any workload – no matter the size or complexity. With low latency connectivity to major UK cities, access to Pulsant Private Cloud and a high-speed national network, your edge computing needs are covered. Our Edge Fabric interconnection provides secure, carrier-neutral connectivity options, giving you seamless access to the internet, peering exchanges and public cloud and graphics processing unit (GPU) platforms.

At Pulsant, reducing your risk and protecting your assets is our top priority. Wherever your business operates, there's a Pulsant edge facility near you – ready to optimise your infrastructure and keep your operations running smoothly.

CLICK HERE to learn more.
www.pulsant.com

EkkoSense

Calling colocation providers! Can you easily tell:

• Which racks, cages, halls and sites have available capacity?

• If you have enough cooling capacity to support more customers?

• Exactly where you stand on customer power usage?

• How to spot equipment anomalies ahead of potential failure?

• If there's a way to automate your service level agreement (SLA), sustainability and environmental, social and governance (ESG) reports?

EkkoSense offers next generation artificial intelligence (AI) driven optimisation software for colocation providers. The powerful EkkoSoft Critical 3D visualisation and analytics software lets colocation providers know exactly what's going on across all their data centre facilities.

We help you take things to the next level to solve the risk, capacity and optimisation challenges of today's AI computing and hybrid cooling environments. EkkoSense's easy-to-use software gives you access to a single pane of glass window into thermal performance and customer compliance across all your rooms, floors and sites.

CLICK HERE to see more on our instant video demo.

www.ekkosense.com

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Keeping a close watch

Adriaan Oosthoek of Portus Data Centers looks at the demand drivers for regional colocation data centres

In the European context, regional colocation data centres have emerged as an ideal solution for businesses looking to balance their operational needs with the requirements of digital transformation, energy efficiency and regulatory compliance. This article explores the three primary drivers for this – enterprises rearchitecting their IT infrastructure toward hybrid cloud models, the regional deployment of artificial intelligence (AI) infrastructure and compliance with new energy efficiency directives. Together, these forces are reshaping the colocation data centre market, driving substantial growth and attracting interest from a wide range of industries.

BEST OF BOTH WORLDS

As enterprises navigate the complexities of digital transformation, hybrid cloud architectures are increasingly being adopted as a balanced approach to IT infrastructure. In a hybrid cloud model, organisations utilise both on-premises and cloud-based infrastructure, enabling them to retain control over critical data and applications, while leveraging the scalability and flexibility of cloud services. Many workloads do not need the flexibility of the public cloud and, hence, do not warrant the additional cost the public cloud brings. This model allows enterprises to optimise their workloads, maintain regulatory compliance and manage operational costs more effectively.

Germany, for example, with its robust industrial and manufacturing base, has seen a notable increase in the adoption of hybrid cloud models, particularly among mid-sized companies and enterprises seeking flexibility in a rapidly evolving business environment. However, adopting a hybrid cloud model often necessitates a regional data centre presence to achieve low latency, reliable connectivity and enhanced data security, particularly for companies in highly regulated sectors such as finance, healthcare and manufacturing.

SOLUTION PROVIDER

Colocation data centres provide a compelling solution for enterprises seeking to implement a hybrid cloud model. By offering space, power, cooling and connectivity, they allow businesses to host critical infrastructure closer to end-users, thereby reducing latency and improving performance. Moreover, colocation providers often have robust interconnectivity with major cloud providers, enabling businesses to seamlessly extend their on-premises systems to the cloud without investing heavily in additional infrastructure.

For instance, a manufacturing company in Bavaria may use a regional colocation data centre to manage operational data from its factory floor, while leveraging cloud services for non-critical applications such as customer relationship management (CRM) or data analytics. This approach not only supports operational efficiency but

also aligns with compliance requirements that may mandate data residency within German borders.

A further consideration is that many regional colocation facilities offer high-density connectivity, allowing enterprises to connect directly with leading cloud providers, carriers and other ecosystem participants. This interconnectivity is crucial for hybrid cloud environments, where seamless integration between on-premises and cloud resources is paramount. Colocation facilities also support multi-cloud environments, allowing enterprises to work with multiple cloud providers based on specific workload needs, thus offering greater flexibility and reduced vendor lock-in.

SPECIAL EFFECTS
The deployment of AI technologies is a significant driver of demand for regional data centres. As enterprises incorporate AI to automate processes, improve decision-making and enhance customer experiences, they require specialised infrastructure capable of handling intensive computational workloads and massive data storage. These demands often need very power dense deployments that typically exceed the capacity of traditional IT set-ups, making colocation data centres an attractive option.

AI applications are data intensive and often involve real-time processing, such as machine learning model training and deployment, video analysis and natural language processing. Many of these tasks benefit from being processed at the network edge closer to the source of data to reduce latency and improve efficiency. For instance, a healthcare provider in Hamburg may leverage AI for diagnostics, relying on high-speed processing of medical imagery. By deploying AI infrastructure in a regional colocation

'The deployment of AI technologies is a significant driver of demand for regional data centres. As enterprises incorporate AI to automate processes, improve decision-making and enhance customer experiences, they require specialised infrastructure capable of handling intensive computational workloads and massive data storage.'

centre, the provider can achieve lower latency and faster response times, which are critical for timely patient care.

Similarly, automotive companies involved in the development of autonomous vehicles are setting up AI training and inferencing infrastructure near testing and production sites. By leveraging regional colocation facilities, these companies can ensure faster data processing and lower latency for the massive datasets needed for autonomous driving. This regional AI deployment strategy not only supports operational efficiency but also aligns with stringent data privacy regulations such as the General Data Protection Regulation (GDPR).

ENERGY REGULATION
In recent years, there have been significant steps to improve energy efficiency across various sectors, including data centres. This has led to the introduction of strict regulations like the European Union (EU) Energy Efficiency Directive, aimed at reducing the carbon footprint of data centres by mandating the use of renewable energy sources, improving cooling efficiency and requiring operators to report energy usage. These regulations align with the EU's broader goals of reducing greenhouse gas emissions and promoting sustainability in the digital infrastructure sector.

The German government's new directives specify efficiency requirements for both new and existing data centres, making energy efficiency a critical factor in selection. Companies now look for colocation providers that not only meet their operational needs but also align with their sustainability goals. Regional colocation data centres that comply with these directives are likely to be more attractive to enterprises seeking to balance IT performance with environmental responsibility.

RESPONSE MECHANISM
Many colocation providers are proactively responding to these directives by investing in energy efficient infrastructure and renewable energy sources. For example, some providers use innovative cooling techniques, such as liquid cooling and free

air cooling, to reduce energy consumption in their facilities. Others have signed agreements with renewable energy providers to power their operations entirely with wind or solar energy. These initiatives not only help data centres comply with regulatory requirements but also align with the sustainability goals of their clients.

Furthermore, the use of renewable energy in data centres is increasingly being recognised as a competitive advantage. Businesses are under pressure from stakeholders to adopt sustainable practices, and choosing a colocation provider that operates on renewable energy helps them achieve their environmental, social and governance (ESG) objectives.

In addition to regulatory compliance, energy efficiency certification is becoming an important factor in the colocation market. Certifications such as EN 50600 or ISO 50001 demonstrate a provider's commitment to energy efficiency and environmental stewardship, which is increasingly a priority for enterprise clients. Many companies now include energy efficiency certifications as part of their colocation provider selection criteria, as they provide assurance of reduced environmental impact and alignment with corporate sustainability policies.

SHIFT WORK

As enterprises shift toward hybrid cloud architectures, they will increasingly rely on colocation facilities to bridge the gap between on-premises and cloud environments, ensuring low latency, data residency and regulatory compliance. The growth of AI technologies and the need for specialised, high-performance infrastructure underscore the importance of regional colocation centres that support real-time data processing and

edge computing. In parallel, stringent energy efficiency directives are pushing data centre providers to adopt sustainable practices, creating an environment where energy efficient colocation facilities are increasingly attractive to businesses with ambitious ESG goals. ∎

ADRIAAN OOSTHOEK

With 20+ years in senior management roles, Adriaan Oosthoek has a deep understanding of colocation and wholesale data centre businesses, as well as significant knowledge of the European data centre markets. Currently chairman at Portus Data Centers, he was chairman of the board of governors for eight years at the Data Centre Alliance industry association until 2019. From 2016-2022 Oosthoek was senior vice president of operations, construction and IT at Interxion and his career has included positions at Colt Technology Services, Telecity Group UK and Redbus Interhouse.

Ezditek breaks ground on new data centre facility in Riyadh

Ezditek has broken ground on its flagship data centre facility, RUH01, in Riyadh to provide a sustainable and scalable foundation for local digital transformation. The facility is located in the world's biggest female university, Princess Nourah Bint Abdulrahman University (PNU), on a 35,000+m² plot and is expected to go live by Q1 2026.

RUH01's strategic location provides an ideal entry point for hyperscalers, cloud providers and enterprises looking to establish a presence in the Kingdom of Saudi Arabia (KSA), with direct access to major carriers. RUH01 will reach 100 per cent of public and enterprise customers in the KSA central region and deliver a maximum capacity of 24MW.

RUH01's capacity to reach 90 per cent of the KSA population within 25 milliseconds enables it to serve growing demand for rapid connectivity. The facility supports digitalisation by enhancing the KSA's data sovereignty and strengthening its position as a global digital hub.

Stulz Modular configures a hybrid cooled data centre for the University of Göttingen's Emmy supercomputer

Stulz Modular has completed an installation at the University of Göttingen for the Emmy supercomputer. A new data centre was required to house Emmy and it needed to be a modular construction with a 1.5MW total capacity that could accommodate further expansion, with the deployment of a cooling system that could remove a heat density of up to 100kW per rack.

The entire data centre comprises high performance computers, 1,120kW direct to chip liquid cooled systems with approximately 20 per cent residual heat, high-density racks, and Stulz CyberAir and Stulz CyberRow precision air conditioning units with free cooling. With 96kW per full rack and 11 racks currently in-situ, there is available capacity for up to 14 racks in total.

Stulz Modular worked with CoolIT Systems to incorporate direct to chip liquid cooling to Emmy's microprocessors, which removes 78 per cent (74.9kW) of the server heat load. A water-cooled Stulz CyberRow air cooling unit removes the remaining 22 per cent (21.1kW) of the heat load produced by components within the server. The new data centre also provides 27 per cent electricity savings at an average 75 per cent load, equating to 3.96GWh per year.

MLL wins network contract at TransPennine Express

MLL Telecom has been awarded a three-year contract from UK rail operator, TransPennine Express. The contract agreement includes the provision of a managed software defined wide area network (SD-WAN) encompassing 37 sites including head office, data centres and stations across the North of England and Scotland. The new network is due for completion this year.

The win followed a competitive tender where enhanced security, resilience and bandwidth availability were high priorities. MLL's managed SD-WAN solution will ensure seamless connection for employees to key administrative applications and includes dual rather than single circuits and the implementation of Fortinet firewalls. The network will be monitored and supported 24/7 by MLL's network operations centre (NOC).

TransPennine Express is MLL's first customer in the transportation sector. The provision of an SD-WAN into its business will ensure TransPennine Express's security and operational platforms are resilient and available, which ultimately will help improve the journey experience for those travelling.

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PROJECTS & CONTRACTS IN BRIEF

Nokia and Aramco have achieved the first-ever 2.4Tb/s PSE-6s full card capacity field implementation in Aramco's operational network.

BSO has announced Europe's first gigascale data centre – DataOne. BSO is targeting April 2025 for DataOne to launch 80MW capacity and, in the long-term, it will deliver 400MW of AI-compatible infrastructure, becoming the largest data centre in Europe by 2028.

CityFibre has completed the primary build of its full fibre network in Hartlepool. The new network is now ready for service to over 33,000 homes and most businesses.

Telent has been appointed by National Highways to operate and maintain its corporate wide area network (WAN), enabling collaboration and digital security across the company's facilities. As well as providing the Wi-Fi infrastructure for all National Highways staff, the corporate network service connects and supports crucial operational systems across over 130 National Highways sites including regional operations centres, satellite offices and depots.

NOS, the biggest communications and entertainment group in Portugal, has selected Entuity Software from Park Place Technologies to monitor its critical network assets and infrastructure.

All you need
to know

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More than meets the I

Dave Swadling of Eclipse Power Networks explains how independent distribution network operators (IDNOs) can release data centre operators from the constraints that threaten to hold back delivery of their potential for the whole economy

▶ The UK's digital infrastructure plays a vital role in the country's economic growth. According to Cloudscene, it contributes around eight per cent of the country's gross domestic product (GDP), generating over £65bn gross value added (GVA). No wonder that successive governments have made digital growth a core feature of the economy. As critical building blocks of the digital economy, data centres will need to keep pace with the explosion in power intensive workloads being generated from cloud computing, the internet of things (IoT), machine learning and artificial intelligence (AI).

GRID IRON

For some time, the expansion of data centres has been subject to a perfect storm of converging events that present real challenges to growth – from planning barriers to demands for greater energy efficiency and sustainability. Business leaders are increasingly focused on the role of data centres in their supply chain emissions to account for their upstream Scope 2 and Scope 3 carbon footprint. But the overriding issue for data centre operators is grid capacity.

Applications made to distribution network operators (DNOs) or the National Energy System Operator (NESO) today are being given connection dates that are 10-15 years in the future. This delay puts projects – and investment – at risk. When your business plan is centred on having X-number of MW or a volume of data centre capacity set-up and running in a certain timeframe, being unable to connect to the grid for a decade is clearly a problem. It's more than a problem for the enterprise, it's a problem for the broader economy.

RULES OF ATTRACTION

The UK is an attractive location for data centres because of its political, economic and energy stability. Without connectivity

at the scale and pace needed by the digital sector, investment in new projects will be redirected into countries elsewhere in Europe and further afield, where it's easier to find sites with suitable power and connection timescales. Also, as we progress towards a zero-carbon economy, we are connecting more renewables to the grid, adding to the connections queue, which is currently standing at 800GW.

This is all taking place as data centres are becoming more prevalent. In short, data centres are waiting longer than ever for larger power connections, at a time when we've effectively topped out the grid in terms of capacity. The light on the horizon, however, is that there are solutions to overcome these challenges, if you know where to look and who to work with.

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MAKING A DIFFERENCE

IDNOs are perfectly equipped to unlock opportunities for data centre operators to connect to the grid. Introduced in 2004 to increase competition in electricity distribution, IDNOs, like DNOs, design, own, operate and maintain electricity networks in the UK. Also, like DNOs, they are licensed by Ofgem.

The difference lies in the 'I' of IDNO. Being independent means that IDNOs are not restricted to a geographical part of the UK, as DNOs are. They can operate nationwide and can be more flexible about how they interpret the standards set by DNOs, which vary from region to region. Because IDNOs operate in a competitive market, they must have more of a customer focus than DNOs. This means that they can adapt and adjust to market challenges in a way that DNOs aren't incentivised to do. They can suggest innovative ways to overcome the challenges and simplify the complexities of getting connected to the grid.

Naturally, IDNOs with experience of helping data centre customers connect to the grid will understand high voltage connections. The effective ones will offer additional advantages, like making a capital contribution, value engineering the grid connection, as well as design expertise to match the substation footprint around the needs of a specific site. They can also apply learned experience from energising other sectors.

DEEP IMPACT

It's often the less technical aspects of power projects that have the biggest impact on whether a project is viable or not. Successful IDNOs must have the ability to build strong relationships with stakeholders across the whole power

ecosystem – the transmission and service operators, DNOs and national grid, grid consultants, renewable developers and more. They typically build a deep understanding of not only who to deal with among the different organisations but, importantly, how to deal with them.

The really effective IDNOs do all of this in a way that is designed to help the data centre customer by providing the right advice in an open and transparent way. Ultimately, the data centre operator needs to convince investment communities of the value and viability of their project. So, the IDNO needs to distil and crystalise both the problem and solution in a language that makes it easy for the client to sell internally. The strength of the relationships mean that they can negotiate with the DNO and national grid to get the best solution for their customers and introduce innovative ways to solve connectivity challenges.

UNLOCKING THE QUEUE
Given the challenges of connecting to the grid, IDNOs can operate independently as 'powerbrokers' to unlock the queue. While there is no silver bullet or any single solution to fit all situations, a customer-centric IDNO has the commercial drive to find solutions.

IDNOs are ideally suited to finding the best solution and bringing the right people together. That can involve putting the investors together with the people who need to build data centres – the grid experts with the people who have the connections, the landowners who want to do something with their land, the grid consultants and designers, and the renewable generation developers. They bring all this together to make as many projects viable as possible by taking advantage of what is already in the grid queue.

SUPPORT STRUCTURE
An IDNO looks for the nuggets that are already in the queue that are suitable for a data centre project. Many renewable energy projects in the connections queue are for battery storage. Ofgem, government and NESO forecasts point

to the UK needing 200GW of capacity to support the energy transition. That means only a fraction of the 800GW pipeline of projects will connect. Some of these will be looking to switch into data centre opportunities and use their place in the queue as an incentive.

Additionally, data centres have large uninterruptible power supply (UPS) battery facilities that can be used as export capacity to support the grid – essential as more variable renewable energy sources come online. So, the right powerbroker in the form on an IDNO can help unblock the connections queue and increase the penetration of renewable energy in the grid.

COMMON DENOMINATOR
Data centres will continue to innovate to decarbonise and find new ways to work collaboratively with the grid. IDNOs are a common denominator within the highly complex equation, as they connect all the constituent parts. It simply makes sense for any data centre developer and operator to have an IDNO inside their camp. Working with a skilled IDNO ensures that appropriate relationships are in place so that hyperscalers and data centre operators are released from the constraints that threaten to hold back delivery of their potential for the whole economy. ■

DAVID SWADLING

David Swadling has been Eclipse Power Networks' director of customer connection development since October 2022. His first role at Eclipse Power Networks was as head of connections in 2016, where he was instrumental in setting up the business and successfully gaining its IDNO license. He now leads the development of new business and, along with his team, secures business opportunities and builds strong, lasting relationships with customers, helping them secure quicker and more cost-effective grid connections.

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