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With data centre demand continuing to rise, the pressure to reduce energy use and carbon emissions has never been greater. The Energy Efficiency Directive (EED) introduced specific requirements for Europe's largest data centres, marking a significant step in the European Union's drive to reduce energy consumption, improve transparency and accelerate sustainability across the digital infrastructure sector.

But as the industry moves from its first reporting cycles towards implementation and enforcement, an important question remains – is the EED living up to expectations? For this month's Question Time, Inside_Networks has brought together a panel of industry experts to assess the impact of the EED so far. They examine what operators have learned from the reporting process, whether the requirements are translating into meaningful improvements and where the greatest opportunities and pitfalls lie.

While energy efficiency remains a key focus for the data centre sector, the impact of AI is becoming equally significant. In this issue, we have a special feature exploring the subject, bringing together three insightful articles. First, James Kirkwood of EkkoSense examines why traditional monitoring approaches are struggling to meet the demands of today's AI data centres. He is followed by Mike Jones of Salute, who explores the critical operational risks that need to be addressed as liquid cooling becomes increasingly prevalent. Finally, Mike Golding of Virtus Data Centres looks at the crucial role of transformers, explaining why they are becoming the high voltage heart of the AI boom.

Also in this issue, we have a special feature dedicated to enclosures, racks and cabinets. Our old friend Colin Parker of Advanced Datacentre Systems explores why rack level security has become critical to protecting today's data centres. André Grossmann and Andreas Klauser of R&M then take a look at how cabling, containment and cable management must evolve to meet the demands of tomorrow's data centre environments.

I hope you enjoy this issue of Inside_Networks and if you'd like to comment on any of these subjects, or anything else to do with data centre and enterprise network infrastructures, I'd be delighted to hear from you.

Rob Shepherd
Editor

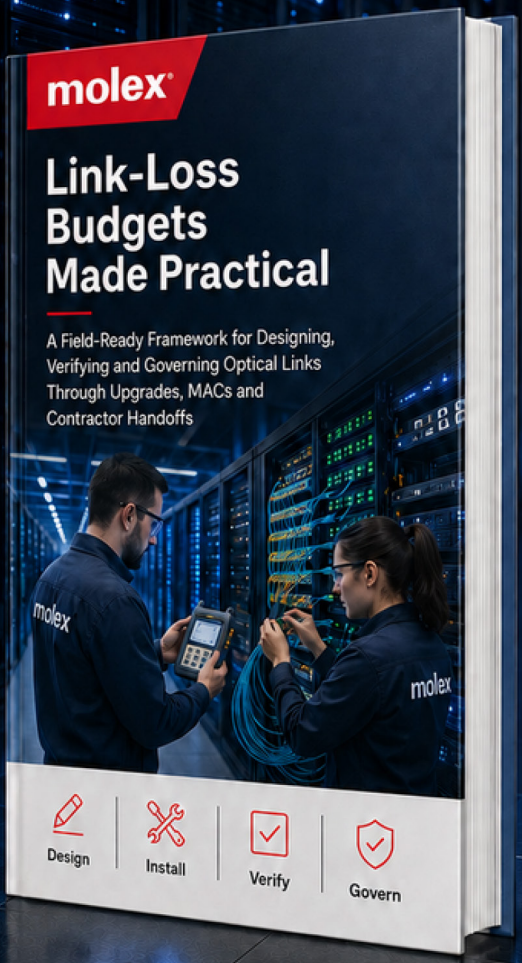
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Black & White Engineering grows its global graduate and apprentice workforce

Black & White Engineering has grown its global graduate and apprentice workforce to 217 people as demand increases for engineering skills across data centres and other critical infrastructure markets. The total means graduates and apprentices now make up 17.3 per cent of the business, with nearly one in every six employees on a structured development pathway.

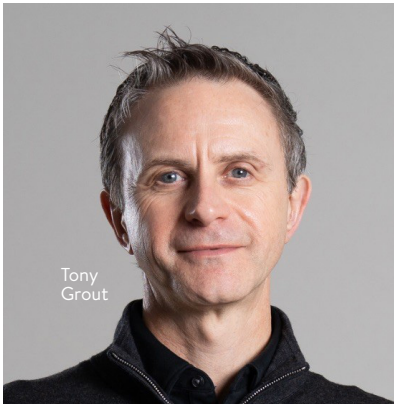

Caff Allen

In 2025 the consultancy welcomed 137 graduates and apprentices into the business, as it continues to invest in long-term training routes at a time when employers are under pressure to build stronger skills pipelines. The graduates and apprentices are based worldwide, with teams in Dubai, Dublin, Edinburgh, Gurugram, London, Manila, Newcastle, Noida and Riyadh.

Caff Allen, global director of learning and development at Black & White Engineering, said, 'Graduate and apprentice development is a significant part of how we build and future proof the business. Welcoming 137 people into these routes shows the scale of our investment in our people, but the more important point is the type of experience they are getting.'

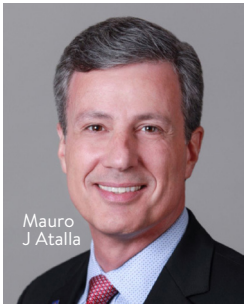
Businesses warned of hidden security risk as poor information governance threatens AI success

AI has rapidly become a business priority, yet despite growing adoption, many organisations are unknowingly increasing their exposure to information security and compliance risks. According to M-Files, the problem isn't the AI itself. Instead, businesses are layering sophisticated AI technologies on top of poorly organised and inconsistently governed information, allowing AI tools to surface content that may have been overshared long before AI was introduced.


Tony Grout

Tony Grout, chief product and technology officer at M-Files, commented, 'Too many organisations still believe buying AI software makes them AI-ready. It doesn't. Every new AI deployment increases the importance of information governance because AI relies entirely on the quality of information it already has. Without strong metadata, content governance and permission controls, organisations are simply creating faster ways to generate unreliable answers instead of producing intelligent systems. As such, they risk undermining the very productivity gains AI is intended to deliver.'

Trane Technologies and Eaton collaborate on reference design to help boost AI data centre efficiency and cut installation costs


Mauro J Atalla

Trane Technologies and Eaton have formed a strategic collaboration to integrate advanced thermal management and electrical system architectures. The companies have created a first of its kind reference design that replaces a traditionally slow, manual and siloed design process with a unified, intelligent system for power and cooling for next generation data centres.

By advancing medium voltage designs for higher power density AI factories, the companies can achieve combined energy efficiency gains of up to 15 per cent, cut copper use by as much as 80 per cent and reduce installation costs by up to 30 per cent compared to conventional low voltage designs, while enabling faster deployment and reducing complexity. As global data centre capacity may almost triple by 2030, with AI driving about 70 per cent of that growth, the reference design provides a more resource efficient approach to scaling data centre infrastructure.

Mauro J Atalla, senior vice president and chief technology and sustainability officer at Trane Technologies, said, 'By combining our advanced thermal management solutions with Eaton's innovative power management solutions, we're delivering a coordinated design that helps customers accelerate deployment, improve efficiency and confidently plan to scale for the future.'

Cybernews launches the AI Trustworthiness Ranking by assessing 500 AI companies

Cybernews has launched the AI Trustworthiness Ranking, which assesses 500 AI companies from 36 countries based on publicly available information related to security, data privacy, organisational transparency and public perception. Each company receives a score from 0 to 100 calculated from four weighted pillars.

The ranking covers 21 AI categories, ranging from AI assistants and productivity tools to coding, music and creative platforms. The 10 most trustworthy AI companies are Google (Gemini), Krisp, Fireflies.ai, Adobe, Magnific, Writesonic, Veryfi, Salesforce, Grammarly and Lovable.


Akshika Wijesundara

Akshika Wijesundara, member of the AI Trustworthiness Ranking advisory board, said, 'AI is shifting from answering questions to taking actions, reading inboxes, moving money and making decisions on our behalf. A chatbot that mishandles data is a privacy problem. An agent with broad permissions and weak governance is a security problem, with mistakes propagating through real systems at machine speed. Companies that clearly show how they protect data, use it and govern what their AI is allowed to do will have a meaningful advantage in earning long-term trust.'

Openreach to bring next generation full-fibre broadband to more than one million premises



More than one million UK premises are set to gain access to faster full-fibre broadband over the next 12 months under new plans to expand the rollout of XGS-PON technology. The upgrade will increase the speed and capacity available across parts of Openreach's full-fibre network as demand for data intensive services continues to grow. The wider rollout follows a pilot launched across 40,000 residential premises in Guildford and surrounding areas in March 2026.

Jennifer Holmes, CEO of the London Internet Exchange, commented, 'As households and businesses rely on increasingly data intensive services, from AI and cloud applications to streaming and smart devices, greater speed and capacity at the access layer will become essential. However, faster fibre into premises is only one part of the connectivity equation. To translate these higher speeds into a consistently high quality experience, investment in access networks must be matched by robust, scalable interconnection across the wider internet ecosystem.'

STL wins its patent dispute with Fujikura and reaffirms its commitment to defending its intellectual property



STL has claimed a definitive victory in its European patent dispute with Fujikura. The European Patent Office (EPO) Technical Board of Appeal has issued a final, binding and non-appealable ruling revoking Fujikura's European Patent EP 3796060 in its entirety and the decision also resolves the UK patent dispute between the parties in STL's favour.

The EPO's final ruling represents a significant legal landmark for STL. The decision strengthens the company's intellectual property position and reinforces its optical fibre connectivity business across global markets.

'STL deeply respects innovation and intellectual property, and we strongly protect our IP positions across the globe,' said Badri Gomatam, group chief technology officer (CTO) at STL. 'This ruling by the EPO's highest appellate body is a powerful affirmation of the strength of our global IP position, the integrity of our research and development and deep technology capability.'

Poor business context is holding back enterprise AI adoption


Richard Bovey

Organisations are increasing their investment in AI but research from Alteryx shows that many are struggling to give AI the business knowledge it needs to make reliable decisions. While most say they are already seeing returns, more than half admit they cannot easily translate everyday business rules, definitions and processes into AI workflows.

The study also highlights ongoing challenges around data access. Only a small share of organisations say their teams have full self-service access to cloud data, with most still relying on IT for routine analytics. Leaders agree that AI works best when business teams can use it directly, yet strategy and delivery remain largely concentrated within technical departments. While 77 per cent agree business context is critical for accurate AI outputs many say it's still missing from their systems, with 53 per cent struggling to translate everyday business knowledge their AI relies on.

Richard Bovey, chief for data at AND Digital, commented, 'AI investment is accelerating fast but without strong data governance, business leaders are effectively flying blind and risk losing oversight of critical value streams. Currently, 58 per cent of organisations describe their data as "chaos", which is more concerning as AI becomes increasingly autonomous.'

NEWS IN BRIEF

AVK has secured an initial investment of over $1bn from Partners Group. The deal is the first external funding in AVK's 36-year history and will finance the rollout of an energy as a service model for data centre operators, drawing on a pipeline of more than 2GW to fund, develop, own and operate on-site power solutions such as microgrids.

Rubicon Professional Services has surpassed 1GW of installed battery energy storage capacity nationwide as it celebrates its 20th anniversary and enables the AI economy.

Eclipse Power has formed a partnership with Power Engineering Services (PES) to give customers faster access to substation equipment – cutting typical lead times from several months to as little as a week. The move comes as substation supply chains remain under sustained pressure from increased demand, long lead times and shortages of new UK stock.

euNetworks has introduced two new environmental performance targets within its sustainability linked loan, designed to strengthen the connection between sustainability and the way the company designs and delivers new network infrastructure.

Belden has been recognised as a World's Top Disability Inclusive Business.

Europe's data centre crisis has a hidden a

Hi Rob

Data centre developers and operators across Europe have almost everything they need – capital and demand. The single binding constraint, however, is grid access, and the queue to get it now stretches 7-10 years against a typical two year build cycle for the facility itself.

We live in a world where Dublin imposed a moratorium on new data centre connections (in place until at least 2028, though exceptions have been granted and considered), Amsterdam introduced a similar pause before lifting it following sustained lobbying by the Dutch Data Centre Association, and Amazon Web Services warned that delays are 'challenging our growth aspirations' across the continent. The only metric that matters now is time to power.

The industry's instinct is to look forward – build new grid, reform permitting, generate behind the meter. Each is a real answer and each takes years the market does not have while AI demand accelerates. However, a faster route is hiding in plain sight.

Across Europe's post-industrial landscape sit large, powered sites such as former manufacturing complexes, energy facilities and heavy industrial estates that are already connected to high voltage infrastructure with contracted capacity. Many now lie under-used or dormant but the connection remains, the substations remain and, in many cases, hundreds of megawatts of accessible capacity remain.

The single most expensive and time consuming element of any data centre development is already in the ground.



That is the opportunity we must look to – not competing for scarce capacity in overburdened hubs.

Industrial land tends to come with fragmented ownership, legacy environmental liabilities, outdated planning designations and corporate owners whose core business lies elsewhere. Not to mention, a mothballed power connection rarely powers down cleanly.

Decades of industrial use leave their mark, so the ground must be surveyed and assessed, identifying contamination, redundant structures and ground conditions that will need to be addressed before development can proceed. A sprawling legacy estate is rarely the right shape, so it is necessary to identify and assemble the specific parcel within it where

answer – and it's already in the ground



power, ground conditions, access, water and optical fibre line up – and shape it to what an operator requires. Around all of it sits the less visible work of untangling ownership, easements and wayleaves, and redesignating land whose planning status was set for a use that ended years ago.

The existing power connection then becomes the anchor for how a site is built out. Rather than wait for a full future connection before breaking ground, the development should be phased around the capacity that is already live – a first phase energised from the retained connection, generating value years before a greenfield site would even receive a connection date, with later phases scaling as on-site infrastructure is upgraded and incremental capacity is secured. The existing connection de-risks the first phase and underwrites the rest, and the sequence can be matched to an operator's own ramp and an owner's appetite for capital.

The land this unlocks is found right across Europe, inside the established Frankfurt, London, Amsterdam, Paris and Dublin (FLAP-D) area, and throughout the wider industrial zones beyond them. It reactivates estates that once anchored Europe's industry and creates employment in the communities around them.

In a market where the binding constraint is time to power, the advantage belongs to those who unlock the grid that already exists rather than wait a decade for the grid that does not. Europe's industrial legacy, it turns out, holds the answer to its digital future and many of the sites that will define the next decade of capacity are, for the most part, already built.

Alex Rabbetts
PoweringAI

Editor's comment

Europe's post-industrial landscape clearly offers an opportunity for the AI age. Rather than consuming valuable greenfield land, these locations could be repurposed as data centres, breathing new life into communities shaped by industrial decline. Investment would create skilled jobs, strengthen local economies and make better use of existing infrastructure, while accelerating digital growth. As Alex makes clear, reusing powered industrial sites is not just efficient planning, it is a practical way to turn yesterday's industrial legacy into tomorrow's digital backbone.

Managing the safety challenge of 8

Hi Rob

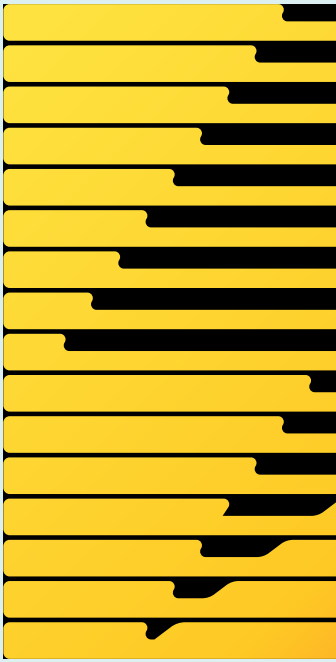
As AI workloads reshape data centre design, the industry is entering a new phase of power infrastructure evolution. The move towards increasingly dense compute environments is making 800VDC power distribution an increasingly practical option for supporting megawatt scale racks. While the efficiency and scalability benefits of these architectures are becoming well understood, one equally important conversation deserves greater attention – how the industry safely adopts these new power systems.

Higher voltage DC changes more than the way power is delivered. It also changes how engineers must think about fault behaviour, protection coordination and safe working practices. As with any significant shift in infrastructure design, ensuring safety must progress alongside innovation.

Arc flash analysis has long been standard practice in AC powered data centres. However, there is currently no industry-wide standard or guidance specifically addressing the electrical hazards personnel may encounter in converter fed 800VDC systems.

As organisations begin evaluating new power architectures to support AI, understanding and managing these risks is becoming an essential part of responsible deployment. Schneider Electric's latest analysis contributes practical guidance that helps the industry evaluate and manage these hazards while working towards safety levels comparable with today's established AC power systems.

Importantly, the conversation should not focus solely on voltage. Safety in 800VDC environments is highly dependent on system architecture. Converter fed DC systems behave differently from traditional AC systems, particularly during fault conditions, where time dependent fault currents and capacitor discharge dominate the earliest milliseconds of an event. This means that understanding system behaviour requires a more detailed, architecture aware approach than simplified calculations alone can provide.



One of the most significant findings from Schneider Electric's work is that overall arc flash risk in 800VDC systems remains low and, in many cases, is comparable to typical AC distribution. The research examined both rack level and facility level architectures that reflect implementation paths emerging across the industry. It also demonstrated that existing arc flash frameworks can be applied to 800VDC systems when used in an architecture aware, time dependent manner, reinforcing the point that design choices have a direct influence on safety outcomes.

The analysis also highlights an important point for data centre operators and

800VDC in the AI data centre era

designers – traditional simplified DC arc flash methods can overestimate risk in capacitor dominated systems. Advanced transient simulation, power system analysis tools and digital twins provide a more accurate representation of fault behaviour, enabling engineers to make better informed protection decisions. Rather than relying solely on conservative assumptions, these technologies allow protection strategies to be developed around how systems behave under fault conditions.



Equally important is the role that system design plays in reducing risk. Architecture decisions including capacitor placement, reverse current blocking devices and millisecond scale protection coordination can materially reduce incident energy. The research demonstrates that safe deployment depends not on DC distribution alone, but on thoughtful engineering choices throughout the system.

This should give the industry confidence rather than concern. Although dedicated industry guidance for 800VDC arc flash hazards is still evolving, the technology itself is not inherently unsafe. The findings show that with appropriate analysis, validated modelling, robust protection strategies and careful system design, 800VDC architectures can be deployed with safety levels that align closely with existing AC data centre environments.

The AI era is accelerating the need for new approaches to power distribution. As power densities continue to rise beyond today's limits, safely adopting these next generation architectures will require the same level of engineering discipline that has underpinned decades of data centre reliability. Advancing power infrastructure and advancing safety should never be viewed as competing priorities. They must evolve together if the industry is to build the resilient, efficient and safe AI data centres of tomorrow.

Sébastien Cruz-Mermy
Schneider Electric

Editor's comment

While 800VDC technology is not inherently unsafe, the lack of guidance on the specific electrical hazards personnel may face is surprising. Higher voltage DC systems bring major opportunities for efficiency and scalability but these must be matched by clear standards, robust procedures and effective training.

As Sébastien highlights, progress in power infrastructure and safety should never be seen as competing priorities. If we are to build the resilient, efficient and safe AI data centres of tomorrow, innovation and safety must remain firmly aligned.

The 2AM Troubleshooting Call

That Could Have Been Prevented

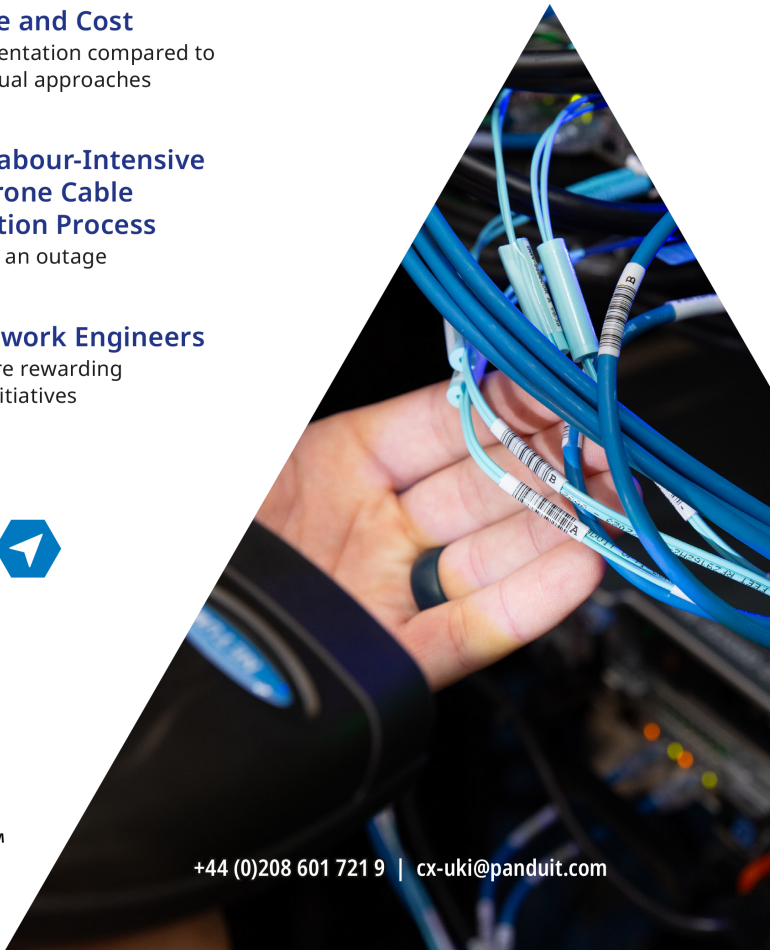
Outdated cable documentation turns routine maintenance into all-hands emergencies because nobody knows what is plugged in where. ***Rapid*ID™ eliminates the guessing game:** pre-labelled patch cords with barcode scanning deliver real-time accuracy.

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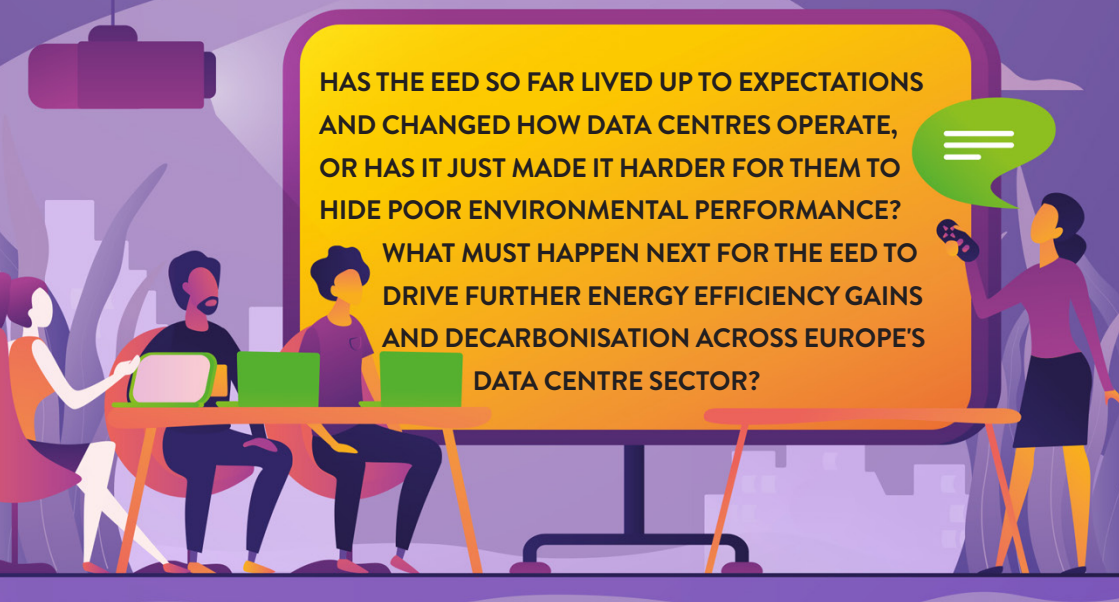
So far so good?

In 2023 the Energy Efficiency Directive (EED) introduced specific requirements for large data centres as part of the European Union's (EU) strategy to reduce energy consumption and support sustainability. Inside_Networks has brought together a panel of industry experts to assess whether the EED is achieving its objectives

The EED is designed to reduce energy consumption and support the transition to a low carbon economy. Requirements specifically targeting data centres were introduced through the revised EED (EU 2023/1791), making it mandatory for data centre operators with an installed IT power demand of at least 500kW to report energy performance. This information is compiled into a publicly accessible database.

Reporting began on 15th May 2024 and must now be completed annually. This represents a significant undertaking, as operators must provide detailed performance data covering installed IT capacity, annual incoming and outgoing data traffic and the volume of data stored and processed. In addition, reporting must include key performance indicators (KPIs) such as total energy consumption, Power Usage Effectiveness (PUE), temperature setpoints, waste heat recovery, water usage and the share of renewable energy used in operations.

The main objective of the EED is to encourage more sustainable digital infrastructure while supporting the EU's 2030 climate and energy efficiency targets. Inside_Networks has assembled a panel of experts to discuss the impact the EED is having on the data centre sector and if it is achieving its aim of making facilities more energy efficient and sustainable.



JAMES ROGERS JONES

HEAD OF SUSTAINABLE DEVELOPMENT AT BCS CONSULTANCY

The EED has had a mixed impact. For new data centres, its influence has been relatively limited because many developers were already designing to meet the stringent efficiency expectations of investors and hyperscale customers. However, it has had a more positive effect on existing facilities by encouraging operators to pursue energy efficiency improvements that may previously have been difficult to justify on return on investment grounds.



That said, there is an important balance to strike. The most sustainable data centre is often the one that already exists.

If older facilities cannot realistically be retrofitted to meet new efficiency targets, replacing them entirely may not deliver the best environmental outcome, once embodied carbon is considered. With demand for digital infrastructure continuing to grow, policy should support practical improvements rather than unintentionally encouraging unnecessary rebuilds.

The EED also risks becoming overly prescriptive in areas such as waste heat reuse. While Energy Reuse Factor (ERF) targets are well intentioned, many data centres are located where there is simply no viable local demand for recovered heat.

This has led to infrastructure being installed primarily to satisfy compliance requirements rather than deliver meaningful environmental benefits. A more pragmatic approach would allow alternative sustainability measures where heat reuse is not feasible, ensuring every site can make a genuine contribution to decarbonisation.

The biggest challenge, however, has been implementation. The EED establishes a common reporting framework but national transposition has been inconsistent, creating a patchwork of thresholds, targets and compliance requirements across Europe. This uncertainty, combined with a complex reporting process, has increased the administrative burden without always accelerating sustainability outcomes.

To unlock the EED's full potential, the sector needs greater consistency across member states, clearer guidance and a simpler reporting process. Giving developers the flexibility to pursue sustainability measures that reflect local conditions will ultimately deliver better environmental outcomes than a one-size-fits-all compliance exercise.

'THE EED ESTABLISHES A COMMON REPORTING FRAMEWORK BUT NATIONAL TRANSPOSITION HAS BEEN INCONSISTENT, CREATING A PATCHWORK OF THRESHOLDS, TARGETS AND COMPLIANCE REQUIREMENTS ACROSS EUROPE.'

EMMA FRYER
DIRECTOR OF PUBLIC POLICY EUROPE AT CYRUSONE

The recast EED is a work in progress and comprises three parts – a data gathering exercise (already implemented), a rating scheme and minimum performance standards (both still under development). The policy objectives, respectively, are to improve transparency, drive competition around sustainability and remove the worst performing facilities from the market.



Let's start with data reporting. The information being submitted is being collated into a detailed database. The most significant achievement of this exercise is the creation of an invaluable information source that can improve transparency in terms of the sector's impact on resource consumption and demonstrate how factors such as size, age, location and business model impact energy and water stewardship. Robust aggregate data at country and regional level will also help to debunk consumption myths.

However, two shortcomings need resolving. Firstly, the European Commission needs to abandon the collection of spurious information like data flows, which are not sustainability indicators and add burden without value. Secondly, reporting scope should be widened to include data centres below the existing 500kW threshold, whose collective impact remains a mystery.

Phase two, the rating scheme, is more contentious. It seeks to compare performance across different geographical regions without enabling a level playing field through climate normalisation, includes metrics not currently reported under the EED and has a strange idea of appropriate ranges, especially for Water Usage Effectiveness (WUE). Its current iteration may unfairly penalise good sites operating under challenging external conditions or prove unreliable in distinguishing the best performing facilities. Thorny policy dialogue looks set to continue.

Phase three, minimum performance standards, presents different challenges. Although the objective is to remove the laggards, with the Cloud and AI Development Act in process, minimum performance standards are being confused with the best in class criteria that will qualify developers to build and operate this new capacity. Minimum performance standards are also horribly vulnerable to lily-gilding at member state level. Fragmentation looms.

The EED has the potential to add much needed transparency and accountability, while driving competition around sustainability credentials. What it does in practice is another matter. And it certainly won't tackle the long tail of smaller, outdated and inefficient facilities, which remain out of scope.

> 'THE EED HAS THE POTENTIAL TO ADD MUCH NEEDED TRANSPARENCY AND ACCOUNTABILITY WHILE DRIVING COMPETITION AROUND SUSTAINABILITY CREDENTIALS. WHAT IT DOES IN PRACTICE IS ANOTHER MATTER.'

JOHN BOOTH
MANAGING DIRECTOR AT CARBON3IT



In 2023 the dashboard states that 17 countries reported data indicating a Power Usage Effectiveness (PUE) weighted average of 1.40, a Water Usage Effectiveness (WUE) weighted average of 0.39, a Renewable Energy Factor (REF) weighted average of 0.84 and an Energy Reuse Factor (ERF) weighted average of 0.0231. Total energy consumption was 11.2TWh and total water consumption was 2,123,247m^3. This was across 627 data centres – 95 very small, 128 small, 170 medium, 193 large and 41 very large facilities.

Table 1. Data Centre Sustainability Metrics – Dataset 1

Size Category	Data Centres (n)	PUE	WUE	REF	ERF
Total	627	1.40	0.387	0.84	0.0231
Very Small	95	1.69	0.159	0.51	0.0084
Small	128	1.61	0.300	0.62	0.0192
Medium	170	1.48	0.231	0.71*	0.0192
Large	193	1.45	0.388	0.92	0.0224
Very Large	41	1.25	0.477	0.88	0.0272

Note. PUE = Power Usage Effectiveness; WUE = Water Usage Effectiveness; REF = Renewable Energy Factor; ERF = Energy Reuse Factor.

In 2024, the weighted average for PUE was 1.36, WUE 0.31, REF 0.89 and ERF 0.0199. Total energy consumption was 16.8TWh and total water consumption 3,781,507m^3. This was across 784 data centres – 119 very small, 180 small, 205 medium, 244 large and 56 very large. In 2024, the range of the EN 50600-4-X metrics were as follows:

Table 2. Data Centre Sustainability Metrics – Dataset 2

Size Category	Data Centres (n)	PUE	WUE	REF	ERF
Total	784	1.36	0.314	0.89	0.0199
Very Small	119	1.71	0.193	0.71	0.0083
Small	180	1.60	0.273	0.70	0.0162
Medium	205	1.47	0.213	0.76	0.0308
Large	224	1.39	0.274	0.92	0.0160
Very Large	56	1.22	0.409	0.94	0.0221

Note. PUE = Power Usage Effectiveness; WUE = Water Usage Effectiveness; REF = Renewable Energy Factor; ERF = Energy Reuse Factor.

It's difficult to ascertain if there have been improvements as the total number of data centres has increased whilst the metrics are relatively stable.

It has certainly made it harder to hide poor environmental performance but it is clear that the focus needs to be on the legacy estate rather than new builds, which after 16 years of the EU Code of Conduct for Data Centres (Energy Efficiency) are relatively efficient. The range of PUE from 1.71 for very small data centres to 1.22 very large data centres demonstrates this.

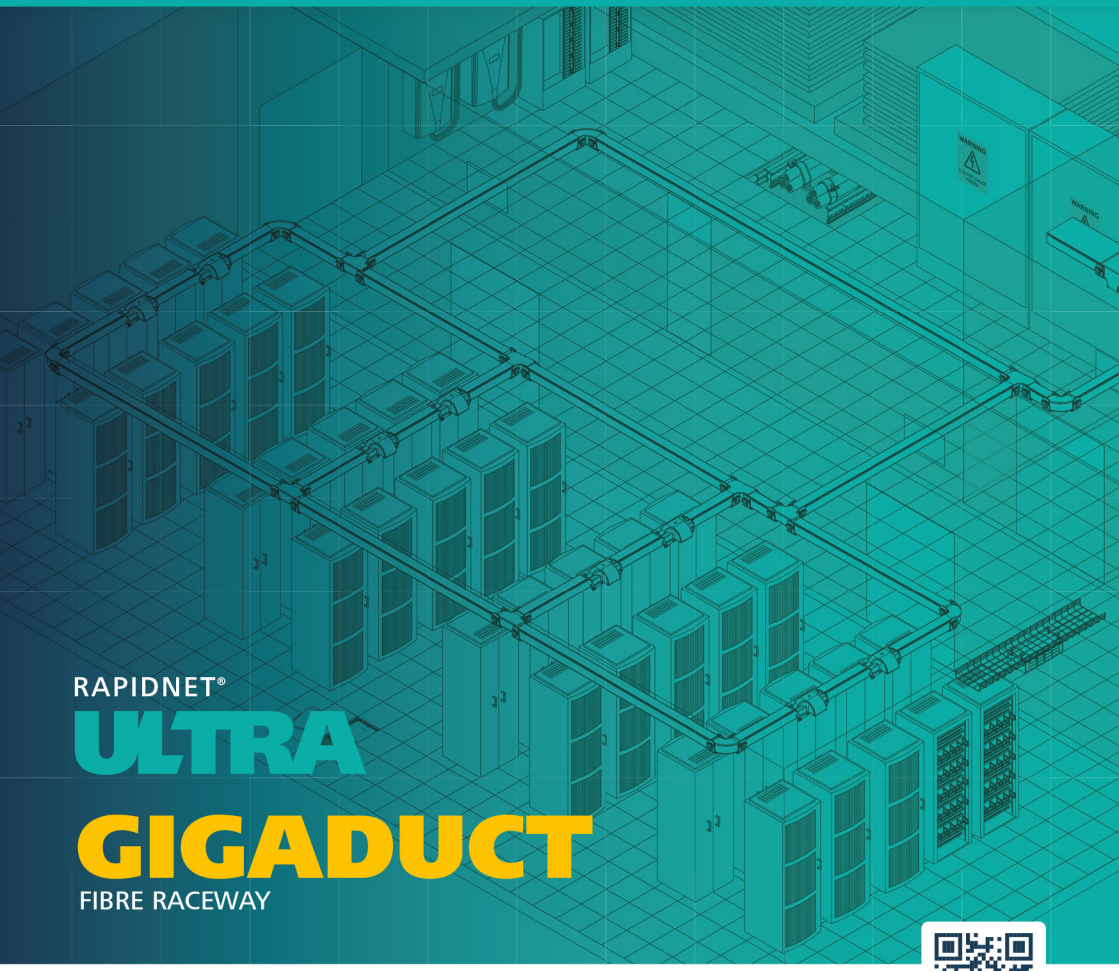
I remain cautious about the efficacy of the EED for data centres. To drive further efficiency gains and decarbonisation, it needs to collect more data from the sector, especially enterprises and telco estates, and to target the impending energy efficiency package for data centres towards the legacy estate.

'I REMAIN CAUTIOUS ABOUT THE EFFICACY OF THE EED FOR DATA CENTRES. TO DRIVE FURTHER EFFICIENCY GAINS AND DECARBONISATION, IT NEEDS TO COLLECT MORE DATA.'

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MICHAEL WINTERSON
SECRETARY GENERAL AT EUDCA

The EED has been an important step forward for Europe's data centre sector because it has shifted the conversation from assumptions to evidence. For the first time, policymakers, operators and the public have access to a common framework for understanding how data centres perform in areas such as energy efficiency, renewable energy use, water consumption and heat recovery.



Importantly, the EED has not fundamentally changed how leading operators run their facilities. The industry has spent many years driving improvements in efficiency because it makes both environmental and commercial sense. Metrics such as Power Usage Effectiveness (PUE), renewable energy procurement and increasingly sophisticated cooling technologies were already well established before the EED came into force.

Where the EED has added value is in transparency and accountability. It creates a more consistent basis for reporting across Europe and makes performance differences more visible, creating stronger incentives for continuous improvement. At the same time, it highlights the considerable progress that much of the sector has already made.

The next phase is critical. The EED must evolve in a way that supports meaningful improvements rather than simply increasing reporting obligations. Data quality and consistency should be a priority, particularly where operators have limited visibility of customer owned IT equipment. Reporting frameworks must focus on metrics that reflect factors within operators' control and that accurately reflect real world efficiency and sustainability outcomes.

At the time of writing, I believe the greatest gains are likely to come from better integration between data centres and Europe's wider energy system. This includes accelerating renewable energy deployment, enabling greater participation in market based grid flexibility services, expanding heat reuse projects and supporting innovative energy solutions such as battery storage, biogas and microgrids.

Europe's digital ambitions will require significant new data centre capacity. The challenge for policymakers is therefore not simply to make facilities more efficient but to ensure that regulation encourages sustainable growth while maintaining Europe's competitiveness. Success will depend on collaboration between industry, regulators, energy providers and local communities to create a digital infrastructure that is both resilient and sustainable.

'REPORTING FRAMEWORKS MUST FOCUS ON METRICS THAT REFLECT FACTORS WITHIN OPERATORS' CONTROL AND THAT ACCURATELY REFLECT REAL WORLD EFFICIENCY AND SUSTAINABILITY OUTCOMES.'

JON LABAN
FREELANCE CREATIVE SYSTEMS THINKER



The EED has made a real mark, although so far more as a transparency catalyst than a transformation engine. As such, the EED is entering a more consequential phase.

What began as a compliance requirement is moving closer to how infrastructure performance is observed, compared and increasingly exposed. That is arguably its biggest achievement to date – forcing data centres to measure and disclose what was previously opaque.

Operators with a total rated power of at least 500kW must now publicly report energy consumption, Power Usage Effectiveness (PUE), temperature set points, waste heat utilisation, water usage and renewable energy use. For an industry long accused of self-policing, mandatory disclosure is significant but the limitations are real. Colocation data centre operators face particular difficulties, as they often lack access to the data they are required to submit.

As of early 2025, most countries had not completed data reporting for 2023. Meanwhile, three countries had not even designated a member state representative and 21 countries had not enacted the national legislation required for reporting. The EED has illuminated poor performance more than it has eliminated it, so what must happen next? In my view, three things are critical:

- Enforcement. The EED currently leaves penalties to member states, creating an uneven playing field. Member states may introduce provisions on compliance and corresponding penalties but these have not been addressed by EU legislation itself.

- Minimum performance standards must follow. The European Commission has commissioned a study to support the development of minimum performance standards for data centres, building on the existing reporting and rating framework. These must be ambitious and time-bound, not voluntary – I repeat not voluntary!

- Waste heat must become a genuine obligation. Forthcoming initiatives include a data centre energy efficiency package alongside a heating and cooling strategy that will place greater emphasis on excess heat. Unlocking that resource would move data centres from energy consumers to contributors. This is the real test of the EED's legacy.

'AS OF EARLY 2025, MOST COUNTRIES HAD NOT COMPLETED DATA REPORTING FOR 2023. MEANWHILE, THREE COUNTRIES HAD NOT EVEN DESIGNATED A MEMBER STATE REPRESENTATIVE AND 21 COUNTRIES HAD NOT ENACTED THE NATIONAL LEGISLATION REQUIRED FOR REPORTING.'

MARK ACTON

OWNER AND PRINCIPAL CONSULTANT AT ACTON CONSULTING



Has the EED changed the way that data centres operate? No, not at all – it is just another reporting burden!

The data collection and reporting mechanisms at a national level have been haphazard and reporting by operators would appear to be far from universal. I hear some would prefer to risk potential penalties at this stage rather than comply with requirements.

I suspect that the data collected is very mixed in terms of accuracy too. The European Commission does not require the metrics to be supplied according to the defined global (ISO) standards for Power Usage Effectiveness (PUE) and Water Usage Effectiveness (WUE), so I would be very surprised if these figures are not being 'gamed' in some way. I have seen some very 'innovative' ways of reporting PUE!

Data centre operators already attempt to make their operations energy efficient and the EED has not changed the way operators approach this. The monitoring, control and reporting of operational parameters can be used to improve efficiency in many sites but I suspect there is far more effort going into providing the most favourable numbers rather than improving the way sites are operated.

The EED also takes no account of the IT equipment installed in data centres or the workloads processed. This is the '1' in PUE and therefore completely masked. Compute draws the power, not the building, which merely adds an overhead, so the EED fails to address the real issues.

The regulators behind the EED are now considering a labelling scheme for all data centres in Europe covered by the EED. They are proposing using PUE, WUE in conjunction with Renewable Energy Factor (REF), and Energy Reuse Factor (ERF). In doing this they insist that PUE is an overall energy efficiency metric for data centres, which it is not!

There is a proposal to normalise PUE based on location within Europe so that southern locations are not penalised for having warm weather. This makes the scheme even more nonsensical in representing energy efficiency. Watch this space for a series of unintended consequences.

Of course, none of this applies to the UK, but I am sure UK regulators are watching closely to see what happens!

'THERE IS A PROPOSAL TO NORMALISE PUE BASED ON LOCATION WITHIN EUROPE SO THAT SOUTHERN LOCATIONS ARE NOT PENALISED FOR HAVING WARM WEATHER. THIS MAKES THE SCHEME EVEN MORE NONSENSICAL IN REPRESENTING ENERGY EFFICIENCY.'

RICHARD PIMPER
CTO & COO AT PORTUS DATA CENTERS



The initial phases of the EED focused on establishing total operational transparency. For any facility in the EU with an IT power demand of 500kW or greater, mandatory annual reporting on Power Usage Effectiveness (PUE), Water Usage Effectiveness (WUE) and the Energy Reuse Factor (ERF) is making it impossible for any poorly performing facilities to hide their environmental impact.

This is being reinforced by the EU digital labelling system, allowing corporate clients to easily compare the sustainability credentials of operators, and mandatory energy auditing that requires facilities to establish official Energy Management Systems certified to ISO 50001 or EMAS standards. This is turning energy efficiency into a boardroom level compliance liability. Data centres are also being forced to migrate entirely toward real-time green energy matching due to the legal requirement to transition to 100 per cent green electricity within the decade.

There has also been a wider impact. Nations such as Germany are using the EED as a baseline to pass strict local laws. The German Energy Efficiency Act (EnEfG) forces new data centres opening after July 2026 to achieve a sustained PUE of ≤1.2 and recycle at least 10 per cent of their waste heat.

To evolve from a tracking mechanism into a true decarbonisation tool, the EED requires concrete regulatory upgrades. This starts with enacting strict minimum energy performance standards. The European Parliament must implement legally enforceable caps on PUE and water use. Facilities failing to hit these numbers should be subjected to progressive financial penalties or risk losing their grid operating licenses.

Additionally, regulators must take steps to ensure corporate trade secret protections do not disguise local grid or water vulnerabilities. True decarbonisation requires full, open source reporting down to the local postal code level. District waste heat infrastructure also needs closer scrutiny. Incorporating waste heat targets is pointless if municipal power grids are incapable of absorbing it. Local governments need to mandate and co-fund physical connections between urban district heating loops and local data clusters.

Lastly, high density AI clusters require regulations that include strict compute efficiency standards for server hardware. The current PUE metrics only measure how much infrastructure energy goes toward cooling, but it ignores how efficiently the actual servers compute data.

> ‘TO EVOLVE FROM A TRACKING MECHANISM INTO A TRUE DECARBONISATION TOOL, THE EED REQUIRES CONCRETE REGULATORY UPGRADES.’

Peter Pearson returns to the network infrastructure sector with new venture

Peter Pearson, one of the longest serving names in UK network cabling, has started a new trade only network infrastructure supply business, alongside his son Greg. Pearson says the decision to launch RealCABLE was shaped by what consolidation among the sector's larger suppliers has done to the buying experience.


L-R Peter and Greg Pearson

Pearson founded Cablelines in 1983 and Cablenet in 1996, growing the latter into a business that shipped millions of patch leads a year. Both companies were acquired – Cablelines by Comtec Cable Accessories in 2018 and Cablenet by CMS Distribution in 2023, where Pearson stayed on to see the business through its integration before stepping away.

'I started out selling computer cables in 1979,' said Peter Pearson. 'Coming back to do this again, with my son alongside me, is the most enjoyable start I have made in more than 40 years. RealCABLE aims to do the basics properly with stock on the shelf, an account that can be opened within the hour and a person who answers the phone.'

The Cabling Group becomes Panduit's lead Platinum Partner in Europe

The Cabling Group has been awarded Panduit Platinum Partner status, making it the only current Platinum Partner in Europe. Panduit's Platinum Partner designation is its highest level of channel recognition, awarded to organisations that demonstrate exceptional technical expertise, customer focus and a commitment to delivering industry leading infrastructure solutions.

The achievement reflects the longstanding relationship between the two businesses and reinforces The Cabling Group's position as one of the UK's leading specialists in network infrastructure and connectivity. The partnership combines Panduit's infrastructure portfolio with The Cabling Group's technical expertise and customer relationships, enabling both organisations to deliver high performance solutions that meet the needs of businesses across the globe.


Jens Holzhammer

Jens Holzhammer, managing director EMEA at Panduit, said, 'This partnership reflects our shared commitment to innovation, operational excellence and delivering long-term value to customers. We are very proud to have The Cabling Group as a Platinum Partner.'

Mayflex achieves EcoVadis Gold Medal for its strong sustainability performance

Mayflex has been awarded its first EcoVadis Gold Medal, marking a major milestone in the company's sustainability journey and placing it among the highest performing organisations assessed globally by EcoVadis. EcoVadis Gold recognition is awarded to companies ranked within the top five per cent of all organisations evaluated during the previous 12 months.



Mayflex has achieved an overall EcoVadis score of 86, a significant increase from its previous score of 69, representing a 25 per cent improvement and elevating the business from Silver to Gold status.

This achievement reflects the company's continued commitment to environmental responsibility, ethical business practices, human rights and sustainable supply chain management.

Donna Swaby, environmental, social and governance (ESG) manager at Mayflex, commented, 'Achieving EcoVadis Gold is a fantastic accomplishment for Mayflex and reflects the dedication, collaboration and commitment shown by colleagues right across the business. Every sustainability initiative, every process improvement and every contribution from our teams has helped us reach this milestone.'

Steve Sutherland becomes BCS Consultancy's first head of digital, AI and data strategy

BCS Consultancy has appointed Steve Sutherland as its first head of digital, AI and data strategy. With nearly two decades of experience, he began his career in market research, spending 11 years working with large and complex datasets on a daily basis before moving into fintech eight years ago with roles at PayPal, TrueLayer and, most recently, Brite Payments.


Steve Sutherland

'The conversation around AI is often dominated by what the technology might do in the future,' said Sutherland. 'My focus is on what it can do today. I've spent my career on both sides of that question, understanding what a business actually needs and then designing and building the thing that delivers it. AI is removing administrative burden, cutting repetitive work and enabling faster, better informed decisions. That's the opportunity at BCS. We already have exceptional technical expertise and my role is to build the digital and data capability that amplifies it.'

Josh Joshi joins Rubix Data Centers as its new chairman

Rubix Data Centers has appointed Josh Joshi as chairman. With almost 30 years of experience in digital infrastructure across global senior positions, Joshi joins Rubix at a crucial time when demand for AI is accelerating worldwide.


Josh Joshi

Joshi most recently served as chairman of AtlasEdge and as an operating partner at DigitalBridge. Prior to AtlasEdge, he spent more than a decade as chief financial officer at Interxion, where he helped scale the business into one of Europe's leading data centre platforms before its acquisition by Digital Realty.

'Over three decades, I've watched digital infrastructure evolve from a niche industry into critical national infrastructure,' commented Joshi. 'AI represents the next great inflection point – data centres are no longer simply part of the plumbing of the digital economy, they are strategic assets for nations, businesses and society. Rubix has all the ingredients to become one of the defining AI infrastructure platforms of the next generation and I am delighted to be joining at such an exciting stage in its journey.'

AVK appoints Andrew Chilcott as vice president of service

AVK has appointed Andrew Chilcott as its vice president of service. This appointment comes as the company builds the aftercare capability needed to support its expanding critical power portfolio across the UK and Europe.


Andrew Chilcott

Chilcott takes responsibility for AVK's service organisation across various areas of the business. He will continue to support the established standby generation service team, while creating dedicated service functions for AVK PowerPods and for its prime power microgrids. Building the supply chain, leadership and engineering teams behind those two newer offerings is his central task.

Chilcott said, 'AVK was a supplier to me for years, so I have followed the growth journey closely and I know the quality of the engineering. What struck me once I got closer was the breadth of what the business is doing now. It is big enough to lead the market and still agile enough to make a real impact, which was a large part of the appeal after 16 years in a global corporate.'

CHANNEL UPDATE IN BRIEF

Belden has been selected for the 2025-26 Emerson Supplier Sustainability Award. The award recognises suppliers that demonstrate strong, measurable sustainability performance and consistent execution across Emerson's global supply base.

Bitzero Holdings has announced a collaboration with Vertiv, further strengthening Bitzero's growing ecosystem of technical, engineering and supply chain providers supporting the delivery of next generation data centre infrastructure. Vertiv's technologies and expertise are expected to serve as a key pillar within Bitzero's broader execution platform, bringing global expertise in critical power and cooling systems.

Sean Gallimore is now chief operating officer at MicroCare, responsible for global operations, marketing and strategic initiatives. Since joining MicroCare in 2025, Gallimore has played a key role in advancing the company's growth strategy and strengthening cross-functional collaboration.

Vertiv plans to expand its manufacturing and testing footprint across Ireland and the North West. The company will be submitting an application to Donegal County Council for an additional 7,000m^2 of space at its Letterkenny facility, supporting the planned creation of up to 300 new jobs in the region.

CHATSWORTH PRODUCTS

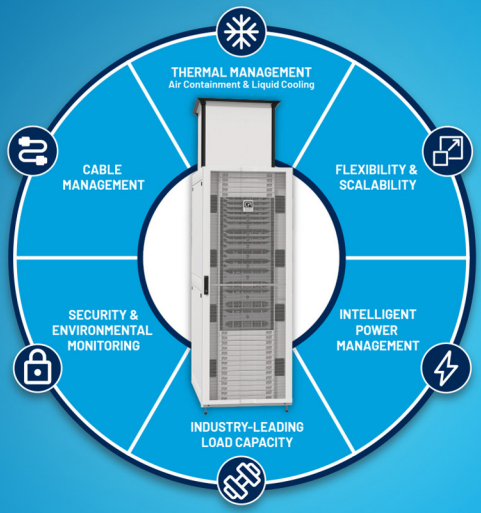
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Beyond the perimeter

Colin Parker of Advanced Datacentre Systems explains why rack level security is critical for protecting modern data centres

When organisations discuss data centre security, the conversation usually drifts towards cybersecurity. Firewalls, intrusion detection systems, ransomware protection and zero trust architectures dominate the agenda. On the physical side, attention tends to centre on perimeter safeguards such as fencing, CCTV, mantraps and biometric entry points. These safeguards are essential, yet they can create a false sense of security.

BLIND SPOT

Once someone has entered the data hall, how well protected is the actual hardware? In many facilities the answer is blunt – not very.

Even though racks house the very servers, storage arrays and network gear that keep business operations running, they often remain the most overlooked link in the security chain. As data centres become more distributed, regulated and critical to business continuity, organisations must broaden their view. Physical protection does not stop at the data hall's door – it must extend all the way to every rack.

ACCESS ALL AREAS?

Modern data centres layer multiple security measures to protect their facilities and ensure only authorised personnel can enter the building. However, being authorised to enter the data hall is not the same as being allowed to access every piece of equipment inside it.

A single data hall may house hundreds of racks supporting multiple customers, departments or business functions. Contractors may be working alongside operations teams, third-party engineers may be maintaining equipment and employees from various departments might all have legitimate reasons to be in the same room.

Without granular physical security controls at the rack level, anyone who can enter the data hall could potentially reach infrastructure outside of their responsibilities. The consequences can be significant. Unauthorised physical access may allow an individual to remove storage drives, disconnect critical services, access sensitive data, connect unauthorised devices or simply make configuration changes that cause service disruption.

DAMAGE LIMITATION

While organisations rightly invest heavily in cybersecurity, the physical compromise of infrastructure can be equally damaging. The challenge is that rack level security is frequently viewed as an operational issue rather than a strategic risk management concern. As a result, it often receives less attention than it deserves and creates a critical vulnerability.

Many data centres still depend on mechanical locks to secure their server cabinets. While locks provide basic protection, they introduce several vulnerabilities.



A widespread problem involves keyed-alike racks, where multiple cabinets share the same key. This simplifies key management but drastically expands access. A single lost or copied key can open numerous cabinets and even when each cabinet has a unique key, other issues persist. Team members lose keys, share them or keep them after leaving the organisation. Managing physical keys across multiple sites quickly becomes a logistics nightmare.

ON A NEED TO KNOW BASIS

Perhaps the biggest drawback of traditional locking systems is the complete lack of accountability. When someone opens a rack door, who accessed it? Why was it opened? How long did it stay open? Was the access authorised? Was the door closed and locked again? In many facilities, answering these questions with certainty proves impossible.

Organisations sometimes resort to spreadsheets, paper sign-ins or manual logs to track access. However, these approaches frequently fall short and verification becomes challenging, especially across extensive or distributed sites.

This issue grows more critical as companies expand infrastructure beyond traditional data centres. Edge facilities, regional sites, telecommunications hubs and campus environments all increase the locations requiring secure physical access management. Put simply, a simple rack lock no longer suffices, as modern organisations demand visibility, control and accountability.

WHY TRACEABILITY MATTERS

Modern organisations work in an environment where accountability and governance are non-negotiable. When something goes wrong, they must prove that safeguards were in place and that those safeguards actually worked.

Recording exactly who accessed critical infrastructure, and when, sharpens incident response and boosts operational resilience. Detailed logs let teams investigate outages quickly, identify procedural breakdowns, uncover unauthorised activities and establish clear chains of accountability. These records also underpin change management by showing that approved

activities happened at the intended time and location.

Frameworks such as ISO 27001, SOC 2 and PCI DSS all stress strict access control, clear accountability and the protection of sensitive data. Financial institutions, government agencies, healthcare providers and operators of critical infrastructure now face heightened scrutiny over governance and risk management.

COVERING ALL BASES

The underlying rule is consistent across sectors – an organisation must demonstrate that access to vital assets is controlled, monitored and fully auditable. If audit logs are weak or missing, it may struggle to answer basic questions during an investigation or a compliance review:

- Who accessed the equipment?
- Was that person authorised?
- When did the access occur?
- Which systems could have been affected?

Failure to answer these questions raises both operational and regulatory risks.

THE ATTENTION IT DESERVES

Environmental, social and governance (ESG) initiatives are now shaping decisions across the data centre industry. While the conversation often centres on energy efficiency and carbon reduction, physical security deserves equal attention. The governance pillar of ESG stresses accountability, risk management, transparency and strong controls. Implementing robust physical access controls creates clear audit trails and assigns defined responsibilities to each role.

There is also an important social dimension. Data centres support services that society increasingly depends upon,

‘An organisation must demonstrate that access to vital assets is controlled, monitored and fully auditable. If audit logs are weak or missing, it may struggle to answer basic questions during an investigation or a compliance review.’

from financial systems and healthcare applications to education platforms and communications networks. Protecting the infrastructure that underpins these services is essential to maintaining trust and ensuring continuity.

Physical security also influences environmental performance. Unauthorised changes to racks or cabling can disturb cooling, airflow or power distribution, causing inefficiencies or outages. Preventing such incidents helps companies run more efficiently and protects costly



infrastructure investments. When we look at rack level security through this broader ESG lens, it becomes more than a simple access control measure.

MONITOR AND MANAGE

Modern data centres are sprawling, distributed ecosystems. Enterprises now manage infrastructure across a mix of central campuses, edge sites and remote locations – often with lean operations teams and tightening compliance demands. This evolution is reshaping how they approach physical security.

Rather than depending only on perimeter fencing and mechanical locks, organisations are seeking tools that deliver real time visibility, strict accountability and finer operational control. Physical and digital security are converging – both now centre on identity verification, access control, continuous monitoring and auditable logs.

The fundamental principle remains simple – securing the building is important but securing the infrastructure inside it is equally critical. The servers, storage arrays and network devices packed into server racks power today's businesses and the broader digital world. If an organisation cannot prove who physically accesses those assets, a critical security gap remains.



NEXT STEP

For decades, the industry has focused on strengthening cyber defences and hardening the perimeter. The next logical step is to extend the same focus on visibility, accountability and control right down to each rack. ■



COLIN PARKER

Colin Parker heads-up sales and marketing activities at Advanced Datacentre Systems. With more than 27 years' experience in the data centre industry, he helps organisations improve operational resilience, reduce downtime and strengthen the security of critical infrastructure. He specialises in data centre infrastructure management (DCIM), environmental monitoring and rack level security, with a particular focus on improving visibility, resilience and compliance.

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DataSecure Technologies is a new British manufacturer bringing fresh thinking to the design and manufacture of mission critical data centre infrastructure. At the heart of its portfolio is the Vault range – a premium generation of data centre cabinets engineered for strength, security, flexibility and easier installation.

Designed for today's increasingly demanding high density environments, Vault cabinets offer 3,000kg+ loading capacity, sliding mounting rails, innovative pivoting split side panels, removable brush top panels and quick release doors. Four-point locking is standard, with an enhanced ten-point locking option available where additional physical security is required.

Supported by advanced UK manufacturing capabilities, DataSecure Technologies can also deliver bespoke and white label cabinet solutions alongside containment, airflow management, cable management and associated infrastructure.

Combining intelligent design, robust engineering and responsive UK manufacture, DataSecure Technologies is creating infrastructure for the next generation of data centres.

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Austin Hughes



InfraPower from Austin Hughes provides enterprise level rackmount and IT solutions for data centres and high density environments. It delivers reliable power infrastructure to support the demands of AI and mission critical technologies.

Austin Hughes' intelligent rack power distribution units (PDUs) are engineered and manufactured to provide exceptional resilience and reliability. Standard features across metered, outlet switched and outlet switched with outlet metering PDU models include digital local touchscreen displays, DC power modules and latching relays.

InfraPower PDUs can be integrated with the InfraSolution Z-3001 networked smart card access control system, providing enhanced rack level security while supporting power over Ethernet (PoE). This helps to reduce installation time and eliminates the need for additional electrical power cabling. Remote IP-based rack door access enables monitoring, control, alarm management and reporting across all server racks.

Environmental sensors provide rack level monitoring, while additional peripherals can be integrated to extend functionality. This creates a complete, intelligent rack management solution.

To find out more **CLICK HERE** or to send an email **CLICK HERE.**

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Whether you're delivering a small network deployment or a large enterprise project, the Environ range offers a comprehensive portfolio that includes wall mounted cabinets, floorstanding racks, open frames and server racks. There is an Environ rack for every environment, application and budget.

Each range is available in a wide variety of heights, widths and depths, giving installers the flexibility to create the ideal infrastructure solution. Built in the UK and backed by extensive stockholdings, Environ racks are available with free next day delivery to the UK mainland.

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We don't believe in one-size-fits-all solutions. We work with you – and your clients – to understand the project, solve the challenges and deliver solutions that are engineered around your exact requirements.

From high performance server racks and bespoke enclosures for both indoors and outdoors to hot aisle containment (HAC), cold aisle containment (CAC) and complete data centre infrastructure, our experienced team provides the design expertise, engineering support and manufacturing capability to make projects happen.

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Whether you need a single enclosure or a complete data centre solution, Dataracks brings over three decades of experience to every project. **CLICK HERE** for more information about Dataracks and its solutions.

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Advanced Datacentre Systems

Data centre security should not stop at the data hall door. When authorised personnel enter, relying on traditional keys or shared credentials leaves individual racks vulnerable, offering little control over who can access critical equipment – or proof that they did.



The dualled powered iAccess controller from Advanced Datacentre Systems brings intelligent access control directly to the rack. Using Wiegand compatible smart cards and electronic door handles, iAccess controls who accesses each cabinet while recording every authorised and attempted unauthorised access. This creates a detailed audit trail for security, compliance and investigations.

For broader oversight, iAccess integrates to Sensorium DCIM through SNMP. The integration consolidates rack access events, alarms and infrastructure data into a single operational platform, allowing teams to link physical security directly with day-to-day data centre management.

Whether protecting a single cabinet or spanning multiple sites, iAccess and Sensorium together deliver the control, accountability and visibility needed to safeguard critical infrastructure where it matters most – at the rack level.

CLICK HERE to discover a smarter approach to rack security or **CLICK HERE** to email us and discuss further.

www.advanceddatacentre.com

Elevate

Racks engineered for modern data centres



As data centres evolve, racks can no longer be treated as simple cabinets. They are critical infrastructure, influencing airflow, cable management, power distribution, security and long-term operational efficiency. The Elevate DCR Series has been engineered specifically for these challenges, offering infrastructure grade performance for enterprise, colocation and hyperscale environments.

Available in a range of widths, depths and heights, Elevate DCR racks support high density deployments with load capacities up to 2,000kg, advanced cable management, containment compatibility and airflow optimisation features designed to improve cooling performance and maximise usable capacity. Separate server and network rack variants ensure the platform can be tailored to different operational requirements, while intelligent power and security options support future scalability.

Download Elevate's latest whitepaper, Treat Your Rack Like Prime Real Estate, to discover why rack selection should be considered a strategic design decision rather than a late stage procurement choice.

CLICK HERE to download the whitepaper.

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ECA

Ahead of the curve

André Grossmann and Andreas Klauser of R&M explain how to design data centre cabling, containment and cable management for what comes next

The most expensive cabling mistake is a design philosophy that looks only at day one requirements. A scheme that meets today's port count, power draw and cooling load is efficient at handover but can quickly become a constraint when higher density servers, increased optical fibre counts, AI clusters, additional power distribution or liquid cooling infrastructure are introduced.

EVERYTHING COUNTS

This is becoming a more urgent issue for data centre and fibre network operators. Traffic growth, cloud migration, AI training and inference, edge computing and higher speed optical networking are all changing the shape of the white space. More data means more power, more heat and more pressure on every part of the supporting infrastructure. Cabling, containment, rack selection and cable management directly influence scalability, airflow, maintenance, resilience and operational risk.

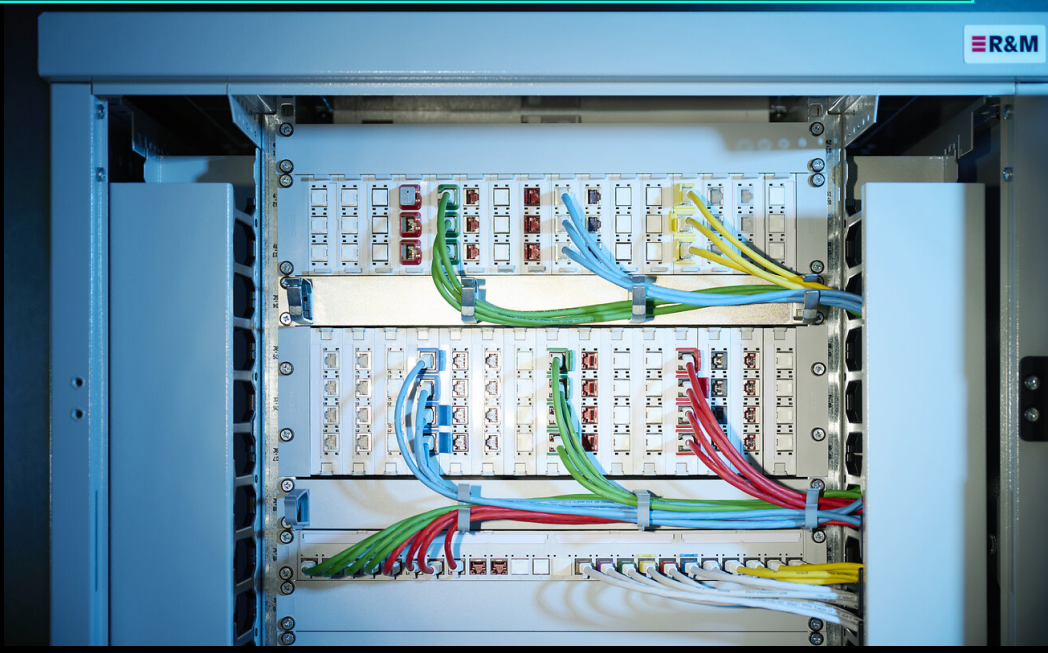
> 'Designers and installers often underestimate the physical clearance required inside and around racks.'

ISO/IEC 11801-5 states that generic cabling should support 'a flexible scheme' and warns that 'incorrect installation, poor administration or inadequate support can threaten quality of service'. TIA-942 describes its scope as setting 'minimum requirements' for data centre telecommunications infrastructure, while BS EN 50600 treats data centre design as a multi-disciplinary facility issue, covering building construction, power distribution, environmental control, telecommunications cabling, security and operational information. These references make clear that cabling should not be treated as an isolated trade package but as part of the long-term operating model.

ENOUGH SAID

One of the most common errors is specifying containment and connectivity around the immediate IT load. That may mean just enough fibre trays for the current switching architecture, just enough rack depth for the first server generation or just enough floor void to route the first phase of power and data. This can be cost effective during construction, but it leaves little room for migration.

A facility designed around 10Gb/s and 40Gb/s may need to accommodate 100Gb/s, 400Gb/s or 800Gb/s migration. A modest enterprise compute environment may later need graphics processing unit (GPU) heavy infrastructure. A standard air cooled hall may need rear door heat exchangers, in-



row cooling or direct to chip liquid cooling. Once the building is live, every retrofit becomes more difficult, more disruptive and more expensive.

AI clusters require dense connectivity between processors, storage and network fabrics. The proven principle of structured cabling remains highly relevant, but the design must be planned for high bandwidth, low loss, manageability and future change. Automated infrastructure management (AIM) is a key part of an integrated data centre approach, combining connectivity, infrastructure management, racks, cooling and power related considerations.

SPACE ODDITY

Designers and installers often underestimate the physical clearance required inside and around racks. This is not a minor inconvenience. Limited space at the front of the 19-inch profiles can restrict patching, bend radius control and labelling. Insufficient rear space makes it harder to manage power distribution units (PDUs), power cords, airflow, sensors and future liquid cooling connections. Tight aisles and narrow containment also make routine work more hazardous and increase the risk of accidental disconnection.

For high density environments, 42U or 48U racks around 800mm wide and 1200mm deep often provide better routing flexibility than narrower alternatives. A front clearance of around 150-200mm between the 19-inch profile and the door should be considered for cabling and patching. Rear access should allow proper dressing of power cables, management of PDUs and integration of monitoring or cooling components. Containment should also be dimensioned for people as well as equipment. Aisles of around 1200mm or more are often needed to support safe access, installation and growth.

This becomes especially important as liquid cooling enters mainstream data centre planning. Liquid cooled servers do not remove the need for good airflow management. Direct to chip cooling does not cover all heat loads and air cooling is still required for residual heat. Pumps,

valves, manifolds, hoses, heat exchangers, leakage sensors and rear door or in-row cooling systems all need space. They also need clear responsibility between IT, facilities and operations teams.

RIGHT DOWN THE LINE

Many network issues appear during integration rather than design. Cables are pulled with too much stress, tied too tightly in raceways, routed without respecting bend radius, measured incorrectly or patched without reliable documentation. These are practical installation errors but their consequences can be strategic – higher attenuation, intermittent faults, blocked airflow, poor visibility and slower fault resolution.



Poor separation of data and power cabling is another frequent problem. Mixing routes, allowing uncontrolled overlength or creating untidy bundles can reduce cooling efficiency and make maintenance harder. It can also complicate compliance with internal operational policies and external audit expectations. In high density facilities, unmanaged cabling quickly becomes a thermal and operational risk.

Good design should therefore include front and rear vertical cable managers, horizontal 19-inch management panels, dedicated side entry routes from roof or floor and properly segregated trays for data and power. Fibre should be protected from excessive bending, compression and contamination. Copper cabling should be routed to reduce stress and congestion, while cable overlength should be designed out rather than hidden in the floor void or behind racks.

AIMING HIGH

The move towards high density fibre also raises the importance of installation discipline. MPO/MTP-based systems, pre-terminated trunks and ultra-high density panels can support rapid deployment and future migration but only when polarity, loss budgets, cleaning, test procedures and labelling are controlled. Higher port density is valuable only if technicians can still identify, access and change connections safely.

This is where AIM can add value. In AI and high density environments, thousands of links may connect processors, switches and storage. Manual records alone are increasingly insufficient.

A digital twin of the connectivity environment can help operations teams see what is connected, where capacity is available and whether work orders have been completed correctly. Automated port documentation, visual guidance and real time monitoring reduce the risk of human error. They also make audits, troubleshooting and capacity planning easier.

TALKING LOUD AND CLEAR

Cabling design should start with the migration path, not the patch list. Designs should anticipate higher bandwidth, denser racks, more diverse cooling, more monitoring points and more frequent change, while containment should be sized for growth. Racks should provide adequate

depth, width, cable space and load capability. Fibre and copper architectures should be modular, standards based and easy to test. Documentation should be created as part of the workflow, not reconstructed afterwards.

For new builds, this means integrating cabling, containment, power, cooling and monitoring decisions from the earliest design stage. For existing sites, it means identifying where cable routes, rack layouts or patching fields are already limiting capacity. Brownfield improvements such as consolidating patch areas, introducing pre-terminated fibre trunks, standardising labelling, installing better vertical management or adding AIM capability can extend the useful life of a facility without a full rebuild.

CARRY THAT WEIGHT

As bandwidth rises and racks become more power dense, the physical layer will carry more strategic weight. The facilities that succeed will be those that give cabling, containment and cable management the same planning attention as compute, power and cooling. A well designed connection is not simply a link between two ports but a long-term infrastructure decision. ■



ANDRÉ GROSSMANN

André Grossmann is operations and customer support manager at R&M. He is responsible for worldwide support and operations for inteliPhy and iPDU solutions and his role includes customer support, training, installation services, pre-sales support and marketing activities. He has been with R&M for 13 years and has nearly 40 years of experience in the IT industry.



ANDREAS KLAUSER

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Twist and shout

In this month's Knowledge Bank, where tech is demystified, Carrie Goetz looks at what the future holds for copper cabling in data centres and intelligent buildings

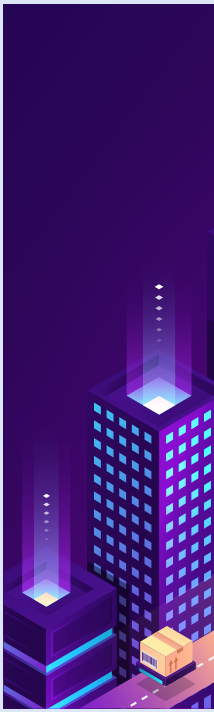
Every transmission medium has its advantages and disadvantages based on the environment in which it will function and the demands of the applications and networks supported. For years some members of the 'light brigade' – those that evangelise optical fibre – have predicted that the end of copper structured cabling systems is imminent. Yet, copper is hanging in there. In fact, copper has seen an uptick in installations in intelligent buildings to support a variety of architectures and applications.

KEEP ON RUNNING

In the data centre, copper is used widely for management applications (typically 100Mb/s to 1Gb/s), lower speed communications (1Gb/s, 10Gb/s, 25Gb/s and 40Gb/s) between servers and switches and, in some cases, as interconnects for uplink ports. The truth is that for all the end of life predictions, copper works well and for many facilities isn't going anywhere. The added expense of fibre components simply isn't justified for many applications and even in high speed facilities that are designed around fibre, often lower bandwidth management links are still run using copper.

Copper has the advantage of supporting multiple speeds, multiple single or two pair applications and power. It is also easy to terminate. It is well known, and as such, remains a preference for many data centres.

Connectors have remained relatively the same over the years and hybrid patch cords take care of any connector interoperability that is non-RJ-45, as in those supporting Category 7/7A and Category 8 channels for 30m. Category 6A copper supports 10Gb/s up to 100m, providing plenty of bandwidth for a lot of facilities – at least for server to switch links. Copper also is used in coax interconnect direct attached cables (DACs) but this is not covered here, as they are point to point and not structured cabling channels. Data centres also use structured copper channels for monitoring, similar to intelligent building applications.



SMART THINKING

In intelligent buildings and workstation applications, copper provides a much needed service that standalone fibre does not – power. Intelligent building applications use a variety of sensors, ports and access points, and while some involve workstation functions others, obviously, do not.

Links are run from a telecommunications area to the various sensors in ceilings, walls, outlets, work areas, window shades,

air vents, lighting and trash receptacles, to name a few. To run the same intelligent building services requiring power over fibre links, a separate powered conductor is needed in conjunction with the fibre cable. This can be two disparate cables or one



hybrid cable. Alternatively, power injection devices can be added at a cost.

The biggest difference between the data centre solutions and intelligent building solutions is the category of cable used and the distances they run. In intelligent buildings, cabling is generally run back to telecommunications areas on each floor, usually within 100m of the endpoint. In a data centre, the cable distances depend on the location of the network switches. When the switches are in row or in the same cabinet, the cabling will be a short run. For any to all configurations with more centralised switching, the cabling may be a longer run, but likely less than 100m.



DECISION TIME

When weighing options, it is important to consider the active electronics port costs, costs of the channel itself and the number of years of useful life. Those that installed Category 6A copper systems have enjoyed every bandwidth change without a change in physical media.

Fibre does not always support multiple iterations and the grade of fibre has also changed multiple times. The connectors have also changed and the number of strands required has altered to accommodate parallel processing. Polarity across strands requires management. That said, fibre supports higher speed applications above 40Gb/s while also supporting lower speed applications at greater distances than the 100m limit of category cabling (30m at the highest speeds). Fibre has a great legacy for storage too.

HERE TO STAY

While your instinct may be to use either or, most facilities are a combination of copper and fibre. Removing the copper in favour of fibre throughout has cost implications that may or may not be ideal in the environment. The right combination of components, bandwidth, cost, longevity and ease of management will impact the final media decisions. While fibre will remain the media of choice for long distance applications, storage, backbone and uplinks, copper has proven that it isn't going anywhere. ■

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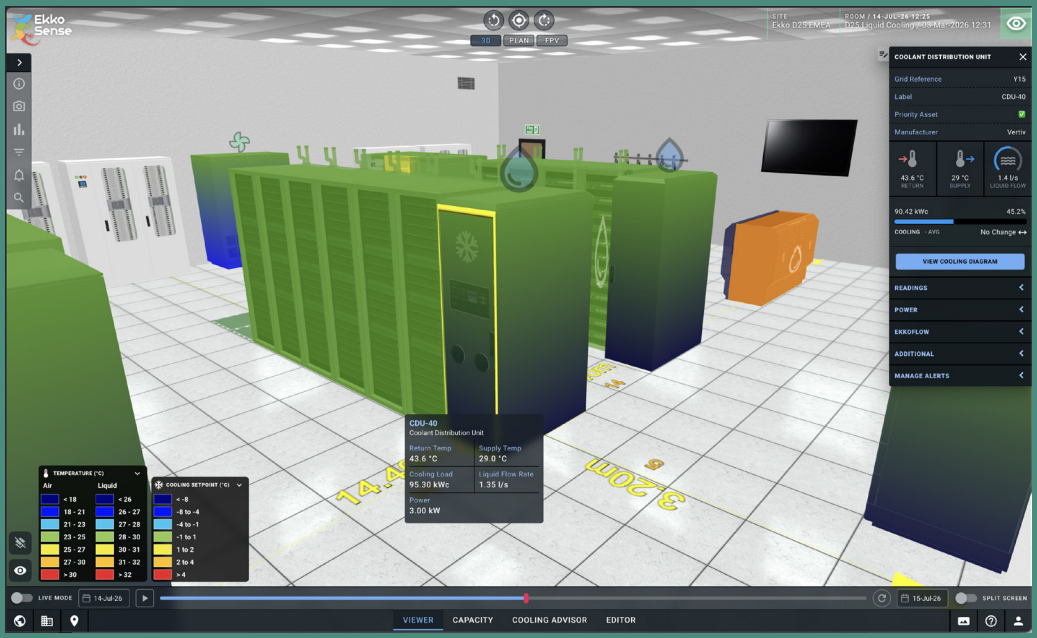
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Keeping it real

James Kirkwood of EkkoSense argues that traditional monitoring is failing today's AI data centres

As AI workloads continue to drive higher compute density and energy demand, data centre operators are under pressure to provide a high performance, scalable infrastructure while still ensuring uptime and resilience. That's challenging when you contrast traditional enterprise data centres that typically operated with power densities of 5-15kW per rack with the latest hyperscale infrastructure supporting AI workloads that can demand 150+kW per rack and next generation configurations pushing towards 200+kW.



SHIFT WORK

Looking forward, NVIDIA's roadmap envisages single racks hitting 600kW in 2027, with MW class racks not far behind. This represents a fundamental shift in the design and operation of data centre infrastructure.

Hyperscale data centres running AI workloads clearly operate at a different scale to traditional facilities. According to the MIT Energy Initiative, a single hyperscale data centre can consume as much electricity as 50,000 homes. The power consumption profile of AI workloads also differs dramatically from traditional computing, with AI model training operations, for example, now running continuously for weeks or months, requiring sustained high power delivery without interruption.

TIME IS OF THE ESSENCE

Today's AI workloads require far tighter operational tolerances, which inevitably translates into an increased burden on operations teams. Unfortunately, traditional monitoring systems designed for predictable, low density environments simply cannot handle the complexity and scale of today's complex AI workloads.

And the challenge isn't just data frequency – it's visibility. When graphics processing unit (GPU) clusters must synchronise across thousands of processors, any power fluctuation becomes potentially catastrophic for expensive training runs. You need visibility measured in seconds, not minutes.

That's why successful AI deployments and their associated liquid and air cooling infrastructure need to be all about understanding potential risks. The focus needs to be on establishing the right level of visibility into increasingly complex hybrid installations across multiple global locations. Given that today's high density AI infrastructure is far more volatile, with thermal conditions changing in real-time, data centre teams simply can't afford to rely on their traditional lengthy building management system (BMS) or electrical power monitoring systems (EPMS) alert mechanisms. If something's not performing optimally, they need to know well in advance.

ACTION PLAN

Traditional monitoring approaches were built for a different era. Point in time snapshots tell you what happened, not what's happening right now. That's why systems such as BMS can collect high frequency data but aren't designed to correlate power, thermal and IT behaviour at the granularity that AI workloads and hyperscale operators require.

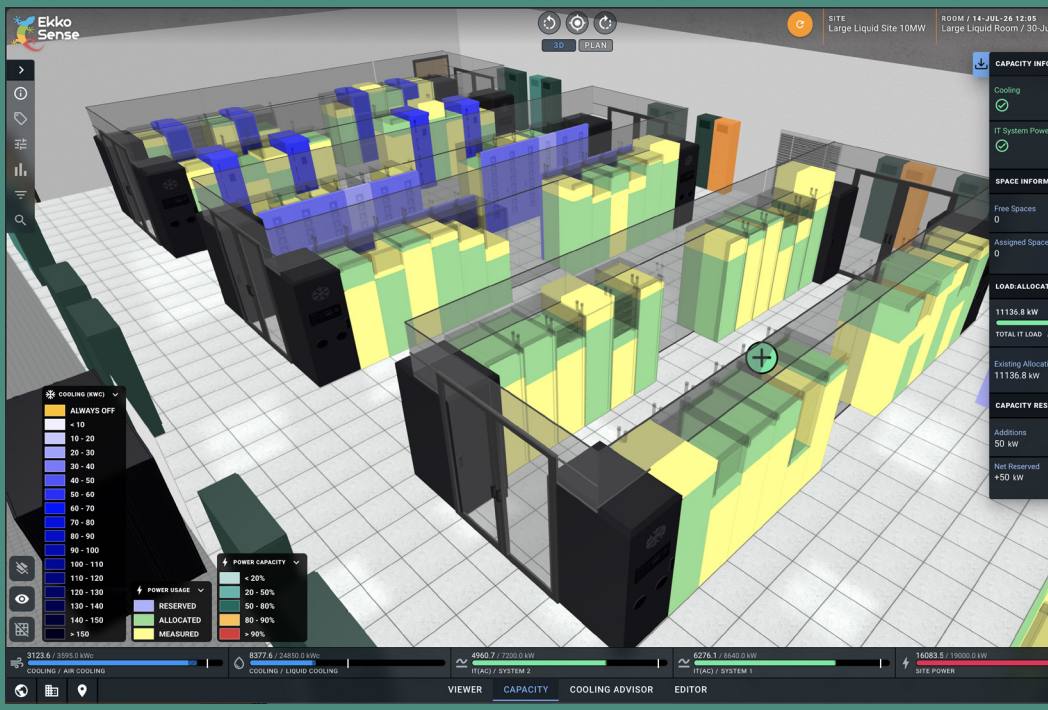
The result of all these systems is a surprising level of data fatigue. BMS, EPMS and data centre infrastructure management (DCIM) systems all have the ability to generate masses of data and, potentially, a great many alerts from the underlying equipment being monitored.

But alerts alone can't always help in determining the next best action, with the sheer volume of notifications often leading operators to overlook the most critical signals. This may be OK when the full on-site engineering team is present on a Monday morning, but what happens when the only person on-site at 4.00am on a weekend starts getting floods of emails saying there's an issue?

> 'An absence of real-time insight means that traditional tools generally lack the level of holistic insight needed to maximise power inputs and optimise energy use. That's because traditional data centre monitoring was never designed for today's complexity.'

PACE OF CHANGE

While data centre investment continues to surge forward, many current legacy facilities and monitoring capabilities simply aren't keeping pace with evolving GPU and AI workloads. For example, most existing BMS and EPMS systems cannot forecast power and cooling bottlenecks effectively to identify any stranded power capacity. An absence of real-time insight means that traditional



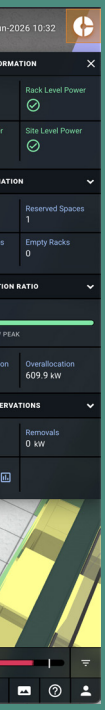
tools generally lack the level of holistic insight needed to maximise power inputs and optimise energy use. That's because traditional data centre monitoring was never designed for today's complexity.

With AI IT racks now worth potentially from £5-10mn each in terms of hardware and cooling equipment, data centre operations management teams are rightly concerned that they are cooled effectively and will continue to perform optimally under potentially challenging thermal conditions. Underneath the excitement of today's AI data centre build-outs, there remains the fear that every facilities and operations leader knows all too well – a thermal or cooling event taking down their mission critical site.

But, without effective instrumentation you'll never know if you have a problem. Unless they have immediate access to granular, real-time telemetry, operators face a difficult choice, which is to overcool the entire facility as a safety buffer or accept significant risk. Most choose overcooling – a decision that's already costing the data centre industry in wasted capacity and energy.

QUESTIONS AND ANSWERS

The reality for today's AI data centres is that a fundamentally different approach is needed – one that's built on real-time visibility rather than periodic snapshots. Increasingly, those who continue to rely on point in time data will find themselves flying blind through increasingly complex environments – continuing to pay for safety margins that real-time visibility would eliminate. However, before evaluating any monitoring approach for AI data centres, operations teams need to consider three



key diagnostic questions about their current visibility:

- How quickly can you identify a developing thermal risk in a high density zone? If the answer is measured in minutes rather than seconds, you're operating with unacceptable latency at hyperscale.
- Can you correlate power consumption with thermal performance at the rack level? If your power monitoring exists in a separate silo from your thermal data, you're missing critical relationships that affect efficiency and risk.
- Do you know your actual capacity headroom – not theoretical, but real-time? If you're maintaining large safety margins because you lack granular visibility, you're already paying for capacity you cannot use.

HERE AND NOW

Data centre operators who have real-time visibility into their thermal and power performance are running differently from those who don't. Not marginally differently, but fundamentally.

The ones with real-time visibility are making power, cooling and capacity decisions based on what's happening in their facility right now – not what their BMS said three hours ago, not what the last quarterly survey found, not what the nameplate ratings suggest should be happening. They're identifying emerging performance issues before they become incidents. They're running cooling systems closer to actual load rather than against a conservative safety margin.

The ones without it are left having to manage by approximation. And in a market where AI workloads are driving power density into territory that existing facilities simply weren't designed for, managing by approximation is a progressively riskier operational posture.

DELIVERING THE GOODS

When tracking performance across AI density, the goal is to know what's happening thermally across data centre halls running multiple cooling methods in parallel. Real-time monitoring unlocks the efficiency gains, capacity optimisation and risk management that legacy systems simply cannot deliver. Operators who embrace this shift will also capture significant competitive advantages in energy costs, sustainability compliance and operational resilience. ■



JAMES KIRKWOOD

As technical account director at EkkoSense, James Kirkwood has been instrumental in developing the company's data centre optimisation approach that helps customers to gain the maximum benefit from its EkkoSoft Critical AI-enabled 3D visualisation and analytics platform. He has worked in the data centre and telecommunications sector for the past 20 years.

Current affairs

Mike Golding of Virtus Data Centres explains why transformers are the high voltage heart of the AI boom

In the relentless expansion of AI, data centres have become the modern factories of the digital age. Server racks loaded with high performance graphics processing units (GPUs) generate unprecedented power demands, often exceeding 100kW per rack. Amid this surge, one critical piece of infrastructure operates largely out of sight, yet determines whether these facilities can scale efficiently, reliably and sustainably – the electrical transformer.

MUST HAVE

Far from being mere utility components, modern transformers, particularly those connected at transmission or super-grid levels, serve as strategic enablers. They step voltages up or down with exceptional efficiency, stabilise supplies, minimise losses and unlock access to high capacity grid connections.

For data centre developers and operators navigating the AI era, investing in advanced transformer architectures is no longer optional. It is now essential for managing explosive growth while meeting environmental and economic imperatives.

POWER DELIVERY

Transformers operate on the principle of electromagnetic induction, a concept pioneered by Michael Faraday in 1831. Alternating current in the primary winding creates a varying magnetic field in an iron core, which induces voltage in the secondary winding. By adjusting the number of turns in each winding, engineers precisely control voltage ratios.

This capability is vital for efficient electricity transmission. Power losses in lines follow Joule's Law ($P=I^2R$) where losses increase dramatically with current. High voltage transmission reduces current for the same power level, reducing resistive losses and enabling long distance delivery from generation sources to consumption points.

SIZE MATTERS

Conventional distribution transformers typically handle medium voltages, stepping down for facility use. Super-grid or transmission level transformers, however, interface directly with high voltage networks – often 380kV or more – before transforming down to levels suitable for data centre substations (typically 10-30kV).

These units are engineered for demanding conditions. They are filled with synthetic oils for superior insulation and cooling, built to massive scales and designed for decades of continuous operation under fluctuating loads. In data centres, they form the core of the electrical backbone, supplying everything from cooling systems and uninterruptible power supply (UPS) units to server racks, including support for emerging high voltage DC architectures like 800V systems.

Even minor efficiency gains yield outsized benefits. In AI-heavy environments, inefficiencies quickly translate into excess



heat, increased cooling demands and higher operational costs. With racks consuming massive amounts of power continuously, optimised transformers directly improve Power Usage Effectiveness (PUE) and reduce the overall carbon footprint of compute operations.

DELIVERING THE GOODS

Projections indicate global data centre electricity demand could double, or even triple, by 2030, fuelled by cloud computing and especially AI training and inference workloads that require tens of MW per cluster on a near constant basis. Traditional electrical designs built around lower voltage distribution networks struggle to keep pace. They introduce more transformation stages, higher cumulative losses, greater reliance on local grid infrastructure and constraints on total capacity.

> 'Forward thinking operators are evolving data centres into active energy hubs incorporating solar, wind PPAs, BESS and, potentially, on-site generation. Sophisticated transformer technology will remain central to integrating these multi-vector energy systems reliably and efficiently.'

Super-grid transformers address these challenges head-on. By connecting directly to transmission networks, they bypass congested distribution levels, reduce the number of voltage conversion steps and deliver higher capacity with improved reliability. Automated voltage regulation at the campus scale provides tighter control, enhancing stability even as loads fluctuate wildly with AI workloads.

This approach also strengthens grid resilience. High voltage primary connections tap into 'stiffer' transmission

networks – meshed systems with multiple feed points and significant renewable integration – which offer superior voltage stability compared to local distribution grids. For data centre operators, this means greater uptime potential and reduced vulnerability to localised disruptions.

SCALE AND REDUNDANCY

Leading facilities are now deploying super-grid transformers rated at 185MVA or higher, feeding dedicated substations capable of supporting hundreds of MW. A typical implementation might launch with 300MW of IT capacity and scale toward 500MW or more, supported by full 2N redundancy – dual independent power paths for every critical system. This architecture can target five nines (99.999 per cent) availability, a benchmark increasingly expected for AI infrastructure where downtime carries enormous financial and strategic costs.

Direct transmission level connections deliver multiple advantages. They minimise impact on surrounding communities by avoiding strain on local distribution networks used by homes and businesses. Operators benefit from lower transmission charges and reduced energy losses, which meaningfully lower long-term operating expenditure (OpEx) at a time when power costs dominate total cost of ownership (TCO). Energy often accounts for 40-60 per cent of a data centre's lifetime costs, making every efficiency improvement financially significant.

ZERO GENERATOR STRATEGIES

Historically, data centres relied heavily on diesel generators for back-up power. While effective for rapid response, these systems introduce substantial drawbacks. They have high embodied and operational carbon emissions, complex fuel logistics, ongoing maintenance burdens and local air quality impacts.

Advanced transformer and grid connection strategies make zero generator designs viable. A robust transmission network, bolstered by renewable inflows such as onshore wind, provides inherent stability. When paired with redundant power architectures, this set-up allows facilities to achieve high availability without on-site combustion back-ups. Data centre operators gain flexibility through being able to retain generator options where desired while offering sustainable alternatives that align with corporate environmental, social and governance (ESG) goals and regulatory expectations.

Europe's decarbonisation push increasingly favours such approaches. Eliminating diesel back-ups not only cuts emissions but also reduces grid usage charges and demonstrates proactive compliance, creating a competitive edge in attracting hyperscale and AI tenants.

STRATEGIC ADVANTAGES

Higher transformer efficiency reduces



waste heat, enabling smaller levels of cooling infrastructure and lower water usage, which is critical in water stressed areas. From a strategic perspective, secure, scalable power access has become a key differentiator. Hyperscalers investing billions in AI clusters require predictable capacity and accelerated deployment timelines that traditional grid connections often cannot guarantee.

Control over power infrastructure translates to greater autonomy. Operators can colocate compute with clean energy sources, sign long-term power purchase agreements (PPAs), integrate on-site renewables and deploy battery energy storage systems (BESS). In all these scenarios, high performance transformers act as the critical interface, efficiently managing diverse and variable energy inputs.

ENERGY HUBS

The Wustermark-style projects emerging across Europe illustrate a broader shift. Facilities equipped with super-grid transformers, high capacity transmission ties and sustainability focused designs are proving that rapid AI growth can coexist with environmental responsibility. These developments serve as blueprints for the industry.



As demand continues to outstrip traditional grid expansion, passive energy consumption is becoming unsustainable. Forward thinking operators are evolving data centres into active energy hubs incorporating solar, wind PPAs, BESS and, potentially, on-site generation. Sophisticated transformer technology will remain central to integrating these multi-vector energy systems reliably and efficiently.

QUIET HERO

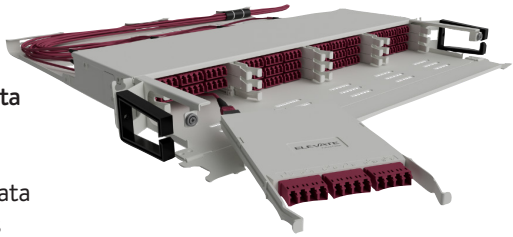
The future of AI infrastructure depends not only on advanced chips and algorithms but on the intelligent handling of electrons – from generation and transmission to final delivery at the rack. The transformer, re-engineered for the demands of the super-grid and AI age, stands as a quiet yet indispensable hero. By enabling scale, resilience, efficiency and sustainability, it ensures that the digital economy's most power hungry ambitions can be achieved responsibly. ■



MIKE GOLDING

Mike Golding is senior vice president of design and build at Virtus Data Centres He has over 30 years' experience in the wider construction industry and 20 years of specific data centre design and delivery expertise, delivering over 750MW of capacity for lease providers and self-build programs of work during this time.

Elevate



Enabling the next generation of AI data centres

AI is accelerating change across the data centre industry, placing new demands on connectivity, power, cooling and operational efficiency. As graphics processing unit (GPU) clusters become larger and rack densities continue to rise, infrastructure must evolve to support increasingly demanding workloads.

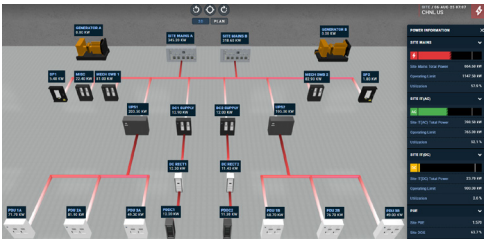
Elevate, from Excel Networking Solutions, delivers a comprehensive ecosystem of solutions designed to help operators build scalable, AI-ready facilities, backed by a 25-year guarantee. At the core are High Density Fibre Solutions incorporating low loss MPO and advanced very small form factor (VSFF) technologies powered by Senko, supporting the migration to 400Gb/s, 800Gb/s and future high bandwidth architectures.

To support power hungry AI environments, Elevate combines intelligent power distribution units (iPDUs), containment, high performance racks and monitoring technologies with advanced cooling solutions delivered alongside strategic partners including Sunbird and nVent. This integrated approach helps optimise performance, visibility and efficiency across the entire facility.

With UK-based configuration services, pre-terminated fibre assemblies and pre-configured infrastructure, Elevate enables faster deployment and reduced project complexity.

For more information **CLICK HERE.**
elevate.excel-networking.com

EkkoSense



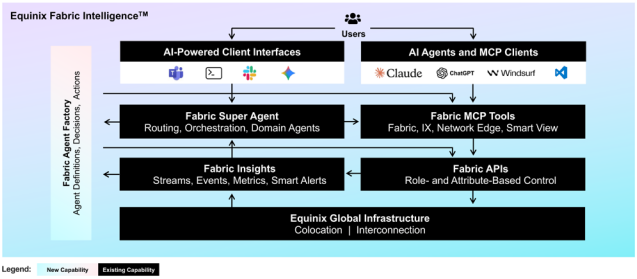
EkkoSoft Critical from EkkoSense delivers AI-driven power monitoring for data centres, providing real-time visibility into power consumption, capacity and operational risk across the entire estate. By transforming raw electrical data into actionable insight, the platform enables data centre teams to make decisions that improve resilience, efficiency and planning accuracy.

Designed to take power monitoring beyond traditional building management system (BMS) capabilities, EkkoSoft Critical offers advanced features including 3D mechanical and electrical (M&E) one-line visualisations, detailed three-phase power analysis and real-time infrastructure visibility to help identify overloads, stranded capacity and misallocated loads.

The platform also delivers automated real-time Power Usage Effectiveness (PUE) tracking and intelligent infrastructure alerting, giving operations teams immediate access to the critical data needed to optimise performance, reduce risk and support future growth.

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

Equinix



Equinix Fabric Intelligence is an AI-native operational layer to manage network infrastructure. Fabric Intelligence enables enterprises to deploy AI-powered networking across their operations – a shift from legacy software defined networking design to simplify the complexities of today's AI workflows.

Manual workflows can create bottlenecks, long deployment cycles hamper growth and visibility gaps compound the challenge. Fabric Intelligence introduces smart automation for deploying, optimising and maintaining global infrastructure, giving organisations a more resilient, efficient and adaptive backbone for their AI workloads.

It provides organisations with a smarter way to manage the complexity of AI by automating how their connections are set-up, adjusted and maintained across these distributed environments. As a result, distributed systems run reliably without constant manual effort, freeing teams to focus on strategic business priorities such as building new AI capabilities and scaling operations.

For more information **CLICK HERE.**

www.equinix.com

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Fluid fundamentals

Mike Jones of Salute identifies the critical operational risks that must be mitigated for liquid cooled AI data centre environments

The operational risks of direct to chip (DTC) liquid cooling require an entirely new approach to data centre operations. Liquid in the data centre is inherently risky. In fact, for decades organisations have had strict rules about not bringing any water into the grey and white space. But AI has turned that policy on its head.

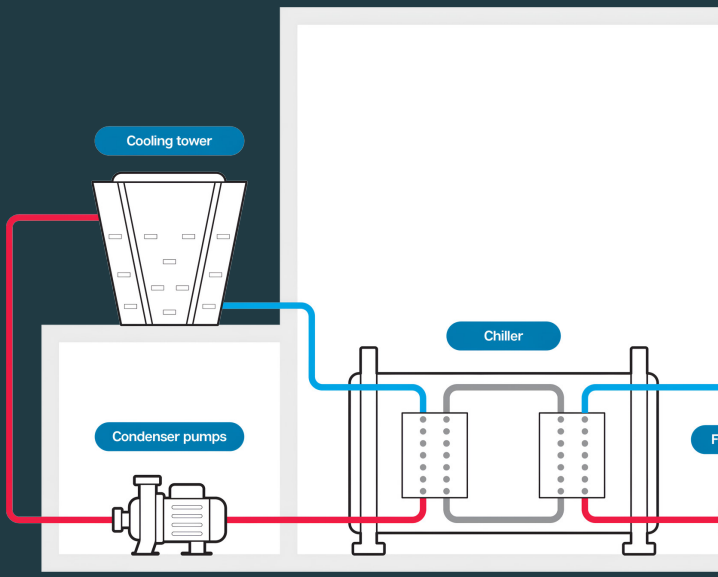
'Companies deploying AI workloads in high density data centres must mitigate the risks of liquid cooling with the right operational strategy.'

A CLEAR AND PRESENT DANGER

Power densities that are measured in hundreds of kW or even 1MW+ per rack can only be cooled with liquid cooling. Specifically, the current NVIDIA product line requires DTC single phase liquid cooling with stringent operational standards for thermal management. Liquid in the data centre is no longer verboten – now it's indispensable.

The dangers of liquid in data centres have not gone away though. Safety for workers must be prioritised and the risks to costly equipment must also be a priority, given the enormous financial investments in AI and high performance computing implementations. Even brief interruptions to liquid cooling can lead to temperature spikes that cause catastrophic damage to AI and high performance computing machines. Likewise, leaks in liquid cooling systems can cause expensive equipment failures and create safety risks for operators.

The processes used in traditional data centres do not translate to DTC liquid cooled environments. A fundamentally new model is needed and it must be customised



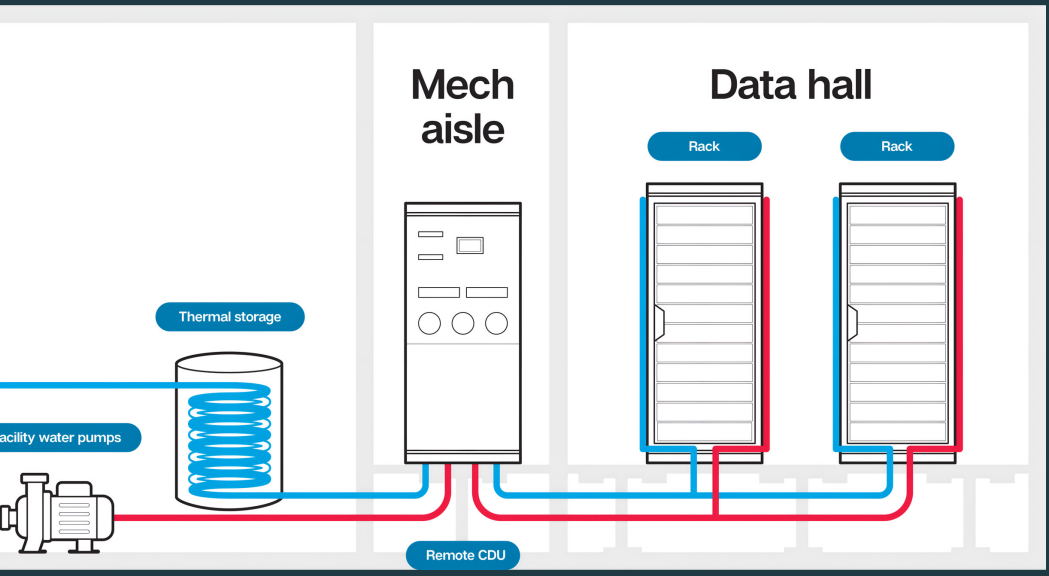
for each facility. The operational model must also include new commissioning processes, chemistry management, leak detection, end to end cooling system maintenance, emergency protocols and more. Nearly every aspect of data centre operations must be revised to support liquid cooling and equipment management.

POINTS OF ORDER

Below are several critical elements for successful DTC liquid cooling operations, which will mitigate the risks discussed above:

- Customise the model for operational requirements and data centre design. The assessment phase is critical because there is so much variation in how organisations are deploying AI and high performance computing servers, graphics processing units (GPUs) and liquid cooling systems.
  The assessment should examine facility design, the technical specifications of the specific AI and high performance computing servers and GPUs being utilised, the end to end cooling systems being deployed from the chiller to facility pumps to cooling distribution units (CDUs) to tech loop and, finally, to the cold plates themselves inside the servers. This assessment should also include specific operational requirements like analysis of the original equipment manufacturer (OEM) maintenance recommendations, site staffing, service level agreements (SLAs), personal protective equipment (PPE), safety and environmental protocols.

- Don't overlook the importance of commissioning designed for DTC. One of the most important but easily overlooked aspects of operational strategy for DTC liquid cooling is commissioning. Commissioning for liquid cooled facilities is more complex than traditional environments and the stakes are high.
  The commissioning process should ensure you not only start with a clean



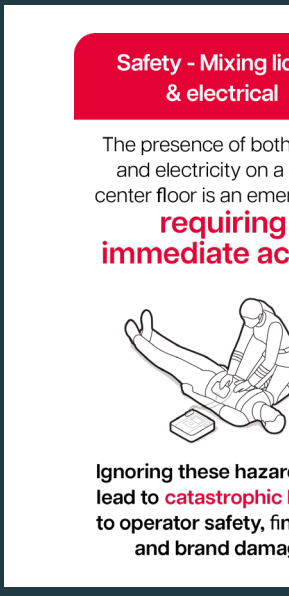
> ‘Even brief interruptions to liquid cooling can lead to temperature spikes that cause catastrophic damage to AI and high performance computing machines.’

environment throughout the liquid cooling system but that it is also set-up to prevent the introduction of particulates or other chemicals after operations begin. This includes complex testing to ensure that there are no leaks or issues with pressure throughout the system.

- Set your operations team up for success with end to end liquid cooling management. One of the responsibilities that will be entirely new for data centre operations teams is the process of operating, managing and maintaining each element in the cooling management system – from the chiller all the way to the chip and back again. This requires learning and hands-on training to understand not only key equipment like CDUs and chemistry testing sensors, but also the specific equipment selection and design for each facility.

- Build a program for successful chemistry management. Another responsibility that will be entirely new for data centre operations teams is chemistry management. There are stringent quality metrics that coolant must meet in order to deliver maximum cooling efficiency.

  Quality issues, such as build-up of biologics in propylene glycol coolant, can inhibit cooling, putting AI and high performance computing machines at risk of overheating. Operations teams must therefore closely monitor the chemistry of coolant to address emerging issues that could inhibit the thermal transfer or create corrosion. They should also be aware that particulates can block the micron fins as coolant passes the cold plate on the surface of GPU and memory chips.



- Prioritise rapid leak detection and remediation. Leak detection and remediation is a critical skillset for operations teams in these data centre environments because of the damage they can rapidly cause to equipment and the dangers it poses to humans.

  Operations teams require education, training, drills and a clear set of processes on each aspect of these responsibilities including prevention, detection, escalation/notification and remediation.

- Implement robust safety protocols. AI and high performance computing environments require specialised safety procedures and safeguards. With the enormous volume of power running through AI and high performance computing data centres, and the presence of liquid near electrical systems, rigorous safety protocols and meticulous training will help protect the safety of operations teams.

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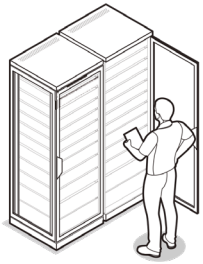
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Liquid (PG-25) damage to the equipment

~$3.5M Single rack
$60-70K per GPU



17-35 times more expensive than CPU based racks
NVIDIA Grace Blackwell 200 NVL 72

Customer demarcation

Delayed ops response
0.5-2++ hours



Downtime can occur due to poor operational co-ordination, commissioning and lack of defined process for leak and chemistry management

SLA payouts due to extended downtime

Cost of downtime
$6.4M per day
50MW data center
(lost GPU rental fees)
$42K per hour 8MW Tech Loop

Downtime can occur due to leaks, flawed design, slow detection, confusion in response and ownership, loss of PG-25 chemistry viability due to biologics and poor chemistry management

Flush a Tech Loop 2-24 hours
Slow ops response 0.5-1 hour

- Make continuous improvements to operational best practices. Static operational methodologies will quickly become outdated given the rapid pace of change in AI and high performance computing equipment. Organisations must therefore ensure that their operational strategy evolves to keep pace with these changes and are complemented by effective training programs to ensure team members perform their roles successfully and consistently.

STRATEGIC DIRECTION

Companies deploying AI workloads in high density data centres must mitigate the risks of liquid cooling with the right operational strategy. Implementing an operational model based on the best practices discussed above will help you protect the safety of your workers, maximise uptime and protect your investments and those of your customers. ■



MIKE JONES
Mike Jones is president global operations at Salute, where he leads the delivery and operational performance of the company's worldwide data centre services business. He has played an integral role in Salute's growth, including the integration of acquisitions and the evolution of the company's unified global operating model.

Plans for first energy efficient data centre as part of Silicon Sands are moving forward

Blackpool Council is taking the next major step in delivering the first data centre as part of its plans for Silicon Sands, a flagship digital infrastructure project at the Blackpool Airport Enterprise Zone. A procurement process is currently being finalised for the development of the first energy efficient data centre, which will bring up to £300mn of investment into the Fylde coast.



Following the formal competitive exercise under the Procurement Act 2023, Blackpool Council intends to award the contract to HOCHTIEF Data Centre Partner UK, which submitted the most advantageous tender. This decision is now subject to a mandatory standstill period and final governance approvals prior to formal contract award.

The new data centre will form the first phase of Silicon Sands. Outline planning permission has already been granted for the sustainability focused data centre along with a 20,000ft² office and research space, with a 6MW electrical supply offer from SP Electricity North West.

Vantage Data Centers and Nebius expand UK AI infrastructure with first deployment in South Wales AI Growth Zone

Vantage Data Centers and Nebius have agreed to deploy high density, NVIDIA powered AI infrastructure at Vantage's CWL1 campus in Newport. The deployment represents the first announced commercial capacity commitment in the South Wales AI Growth Zone and will support growing UK demand for domestic AI compute capacity.



Under the agreement, Nebius will lease high density capacity at CWL1 to support AI training, inference, agentic AI and enterprise AI workloads, serving enterprises, researchers, start-ups and public sector organisations seeking access to advanced AI infrastructure. This capacity is part of Nebius' broader UK expansion and commitment to scale domestic AI compute capacity.

The agreement builds on Vantage's longstanding presence in Newport and reinforces the role hyperscale data centres play in enabling the UK's AI economy. Operational since 2010 and one of Europe's largest data centre campuses, CWL1 provides the scale, connectivity and power infrastructure required for high density AI workloads and serves a diverse base of hyperscale, enterprise and public sector customers.

DataVita secures £300mn for data centre rollout in Scotland's AI Growth Zone



DataVita has secured a £300mn debt facility to expand and build two data centres in the North Lanarkshire AI Growth Zone, unlocked by a £202mn financial guarantee from the National Wealth Fund. The facility has been raised with participation from a syndicate of lenders including ING, ABN AMRO, Santander, the Scottish National Investment Bank and Siemens Financial Services through Siemens Bank.

The National Wealth Fund's guarantee is provided against £252.5mn of lending delivered by ING, ABN AMRO and Santander. The remaining portion provided by SNIB and Siemens Financial Services is uncovered. The investment will expand DataVita's existing DV1 data centre and fund the construction of a new data centre called DV3.

The financing will enable the delivery of Scotland's first AI data centres within a designated AI Growth Zone, driving growth in the wider Glasgow region. The development of DV1 and DV3 will act as the first step in a larger planned data centre campus in the area, helping to establish North Lanarkshire as a key location for AI infrastructure in the UK. The two developments financed by this facility will create around 600 jobs during construction as well as 100 permanent high skilled jobs once completed.

PROJECTS & CONTRACTS IN BRIEF

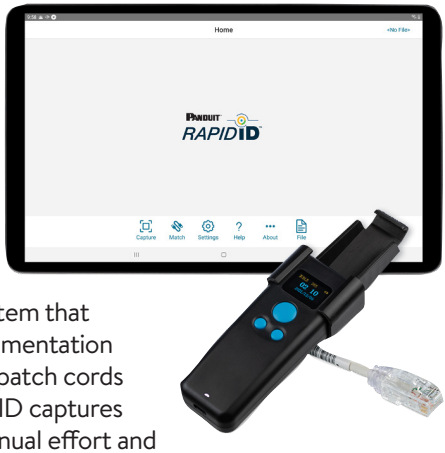
Vertiv has modernised the cooling infrastructure at NFrance's sovereign data centre. The solution is built on the Vertiv Liebert PDX direct expansion system, while the Vertiv Liebert HPA-HCR condenser integrates electronically commutated fans, supporting heat dissipation without any water consumption and low acoustic impact.

Bournemouth, Christchurch & Poole Council (BCP) has further extended its network services contract with MLL Telecom until at least the end of 2029. The expanded remit builds on MLL's longstanding network services partnership with BCP, which commenced in 2019 following a competitive tender.

Saft has been awarded a major contract by Naval Group to supply next generation lithium ion (Li-ion) battery systems for the Barracuda and Scorpene submarine families. This award represents a strategic milestone for Saft, strengthening its position in European defence programs and confirming the growing demand for its Li-ion battery technology.

Community Fibre has adopted Luminance's platform to centralise contract intelligence as it scales. Community Fibre now has a single, comprehensive view of every obligation, renewal and supplier commitment, enabling faster review of inbound agreements and stronger governance.

Panduit

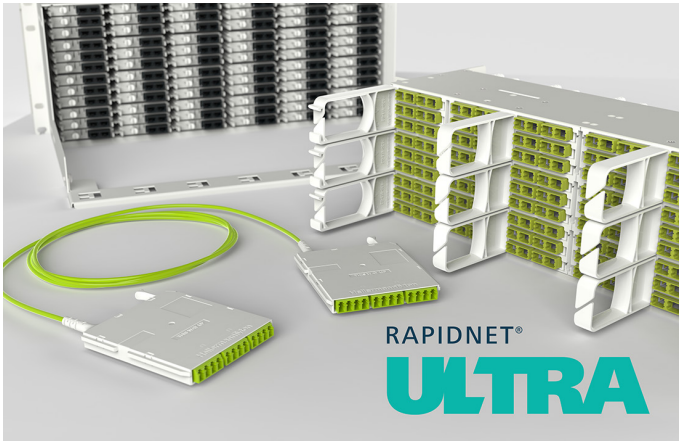


Panduit's RapidID solution is designed with flexibility in mind, whether your organisation is getting started with network documentation or managing a large, multi-site infrastructure. The solution offers a combination of features – from essential tools to advanced, multi-user capabilities that grow with your network.

RapidID is an automated network mapping system that replaces labour intensive, error prone cable documentation with a fast, accurate solution. Using pre-labelled patch cords and barcode scanner (Bluetooth or wired), RapidID captures cable data in real-time, dramatically reducing manual effort and eliminating human errors. Ideal for data centres, telecom rooms and multi-tenant infrastructures, RapidID is designed to save time and keep your network running smoothly.

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

HellermannTyton



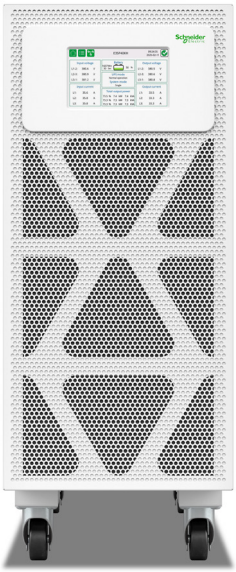
HellermannTyton is a pioneer in pre-terminated infrastructure with its RapidNet solution. RapidNet is the pre-terminated, pre-tested cassette based plug and play system developed by HellermannTyton that is designed to deliver high performance and improve the ease and speed of infrastructure deployments.

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

With a range of cassette formats and fibre assemblies, RapidNet ULTRA delivers high performance and fibre capacity to meet the demands of the modern day data centre.

To find out more **CLICK HERE.**
www.htdata.co.uk

Schneider Electric



Schneider Electric has launched the Easy UPS 3S Pro, a new three-phase uninterruptible power supply (UPS) designed to provide simplified, reliable and cost effective power protection for businesses operating critical infrastructure and applications. The Easy UPS 3S Pro is now available across all IEC markets worldwide including Europe, Middle East and Africa.

Available in 10-40kVA capacities and supporting both internal and external battery configurations, the Easy UPS 3S Pro is engineered to make business continuity easy for small and medium data centres, commercial buildings, healthcare facilities, manufacturing environments, telecommunications infrastructure and transportation applications.

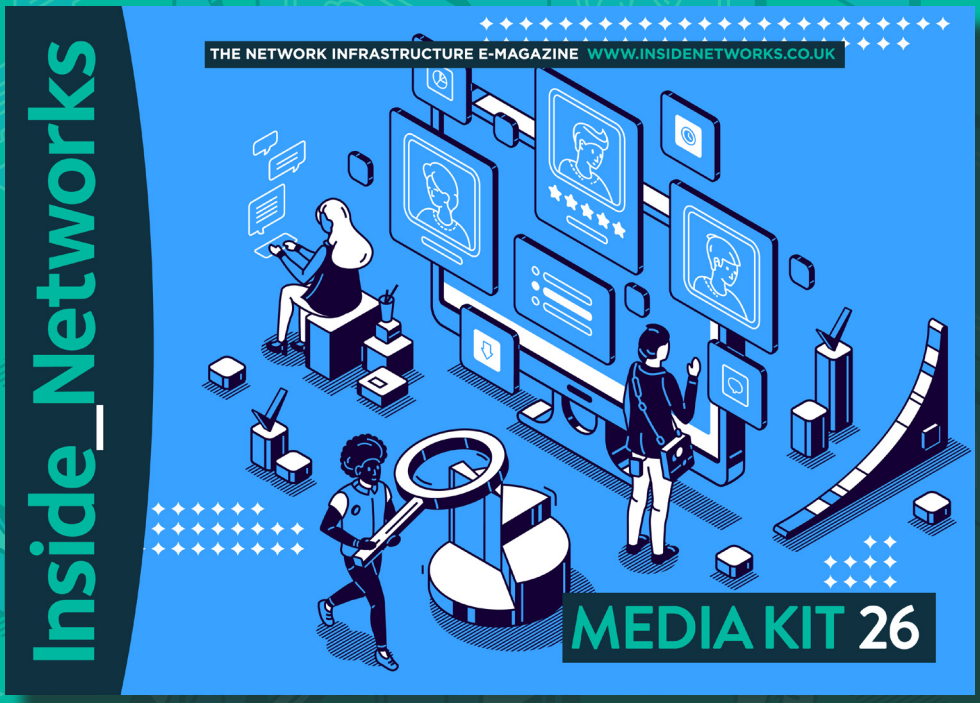
The Easy UPS 3S Pro combines robust electrical performance with simplified deployment, operation and serviceability in a compact and lightweight design. Offering efficiency levels above 96 per cent in double conversion mode and up to 99 per cent in eco mode, the solution enables customers to reduce energy consumption while maintaining resilient power protection for critical loads.

For more information **CLICK HERE.**

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Cooking with gas

Javier Cavada of Mitsubishi Power examines why AI-era data centres need to look beyond grid power



The AI boom is often described as a race for better chips, bigger models and faster networks. But the real constraint is power. Without reliable and abundant power, neither AI nor cloud computing can scale at the speed the market expects.

DOUBLE TROUBLE

According to the International Energy Agency's (IEA) Energy and AI report, electricity use from data centres worldwide is expected to more than double by 2030 to around 945TWh. That is roughly equivalent to the level of electricity Japan uses in a year.

Goldman Sachs Research has likewise estimated that AI could drive a 160 per cent increase in data centre power demand by the end of this decade. That growth is coming from multiple sources at once including cloud services, hyperscale campuses, AI training and AI inference. These are collectively turning power into one of the primary constraints on digital growth.

The UK illustrates this tension particularly clearly. The country remains one of Europe's most important digital infrastructure markets, yet surging demand for data centre capacity is colliding with a power system already strained from wider electrification.

The National Energy System Operator's (NESO) Future Energy Scenarios show that electricity demand in Great Britain is set to rise steadily as transport, heating and industry continue to electrify. At the same time, the UK government has classified data centres as critical national infrastructure, underscoring their central

‘Gas turbines can enable greater use of renewables by providing dependable generation when wind or solar output falls short. They also offer a credible path to lower emissions over time through fuel flexibility.’

role in finance, communications, public services and day to day business operations.

A SYSTEM IN REFORM

The challenge is not simply how much electricity the UK can generate in aggregate, but whether sufficient power is available in the right places, at the right time and at the required scale. Large parts of the network need significant upgrading, yet the process of securing new grid connections has become so constrained that NESO is reforming the entire system. For large new data centre projects, this often translates into lengthy delays and continued uncertainty over when power will be available.

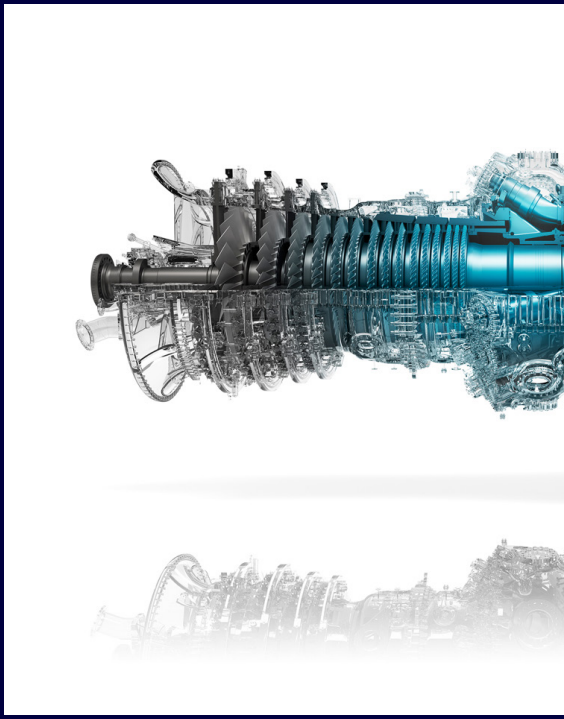
That poses a serious risk for an industry built on uptime. Data centres are engineered to deliver 99.999 per cent availability, underpinning services such as banking, healthcare, government systems, enterprise software and, increasingly, AI workloads that users expect to always be available. A delayed grid connection is primarily a commercial problem, while a weak or unstable power supply is an operational one. For hyperscalers, relying solely on the grid is becoming increasingly risky – particularly in regions where demand is already high and network reinforcements may take years to deliver.

SHIFT WORK

This is why power strategies are beginning to shift. The grid will remain essential and, in many cases, it will continue to be the primary source of electricity. For some new developments, however, it can no longer be the only solution.

Developers and operators now face a broader set of choices. They can wait for the grid capacity and accept longer project timelines, or they can build on-site generation next to the data centre. They can even create private wire systems that connect generation directly to the campus. But some are going further, pursuing integrated energy park developments where power generation, storage and digital infrastructure are planned together from the start.

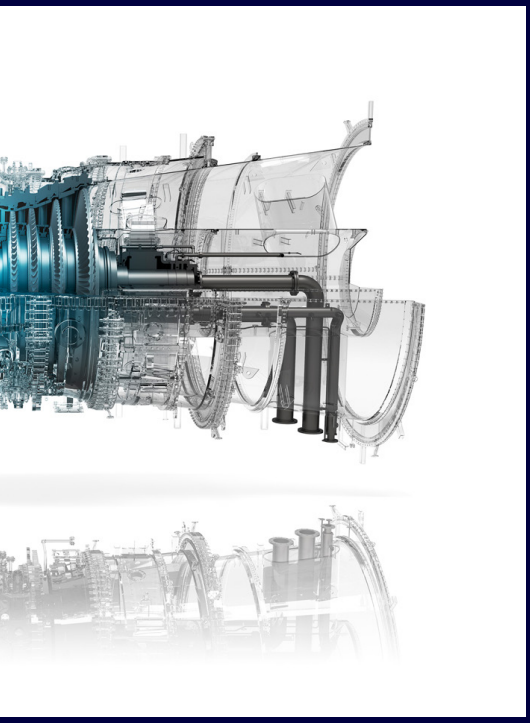
This shift is already evident in other markets. In the US, the Department of



Energy defines microgrids as local power systems that can disconnect from the main grid and operate independently. That model has long been used for hospitals, military bases and other critical facilities, and it is now becoming directly relevant for data centres. In effect, energy infrastructure is increasingly being treated as a core function of the data centre itself, not as something separate to be supplied by a third-party.

SUPPORT STRUCTURE

These new power models place gas turbines at the centre of the picture. AI-oriented facilities require large volumes of dependable electricity, with very little tolerance for interruption. They also need flexibility to accommodate fluctuating compute loads and to manage the variability inherent in renewable generation.



As the IEA's Electricity 2024 report notes, power systems with rising shares of wind and solar need substantially more flexibility to maintain reliability. Modern gas turbines offer fast start capability, high output and dispatchable generation, making them well suited to respond to sudden changes in demand or renewable supply.

FIRM FOUNDATIONS

System stability is an additional consideration. As inverter based resources make up a growing share of generation, grid operators are paying closer attention to inertia, voltage control and overall system strength. NESO's work on stability services reflects the rising importance of these factors. In this context, synchronous generation continues to play a valuable role, supporting both the wider grid and private power networks serving large industrial or digital loads.

For data centre operators considering on-site generation, the combination of high capacity supply and local stabilising capability is particularly significant. Gas turbines can provide a robust foundation around which energy storage and renewables are integrated, reducing exposure to periods of low wind or solar output without compromising operational reliability.

This shift is also reshaping the supply chain. Demand for flexible, high capacity power equipment has risen sharply, prompting manufacturers to respond. Mitsubishi Power, for example, has committed to doubling its gas turbine production capacity to meet growing global demand. This move is a clear signal of where the wider market is heading. The expansion of AI and digital infrastructure

is now influencing decisions across power equipment manufacturing, energy planning and broader industrial investment.

RELIABLE AND CLEAN POWER

Of course, reliability is not the only issue. Data centre operators are also under growing pressure to cut emissions and align with net-zero targets – a pressure that will only intensify. This, however, should not be framed as a choice between reliable power and cleaner power. In reality, operators need both. Gas turbines can enable greater use of renewables by providing dependable generation when wind or solar output falls short and they also offer a credible path to lower emissions over time through fuel flexibility.

That is why hydrogen readiness matters. Both the UK Hydrogen Strategy and the IEA's Global Hydrogen Review 2024 highlight hydrogen's potential role in cutting emissions while strengthening power systems.

A hydrogen ready turbine allows operators to meet today's reliability requirements while preserving the option to transition to lower carbon fuels as supply chains, infrastructure and economics mature. For long-life assets such as data centres, that flexibility is critical. Facilities built today must remain viable and competitive within an energy system that is likely to look very different in 10 or 20 years.

The power model that supported the first wave of cloud growth will not be sufficient for the AI era. The next stage will still rely heavily on the grid but it will also demand a more flexible approach – one that includes on-site generation, greater use of private energy networks and energy parks designed around resilience from the outset. Power is no longer a background consideration. It is becoming one of the decisive factors shaping where, and how quickly, AI infrastructure can be developed.

STRATEGIC DIRECTION

For data centre leaders, power has shifted from an operational concern to a strategic imperative. Those who plan proactively will be best positioned to scale with confidence, protect uptime and meet their environmental commitments at the same time. ■



JAVIER CAVADA

Javier Cavada is president and CEO EMEA at Mitsubishi Power. With more than 20 years of global energy experience, he is a recognised leader in the energy sector and a driving force behind Mitsubishi Power's ambitious growth and decarbonisation plans. His extensive experience spans the energy sector, from traditional power systems to innovative renewable energy systems and storage solutions, which gives him a unique, holistic perspective of the energy industry.

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