

Inside Networks

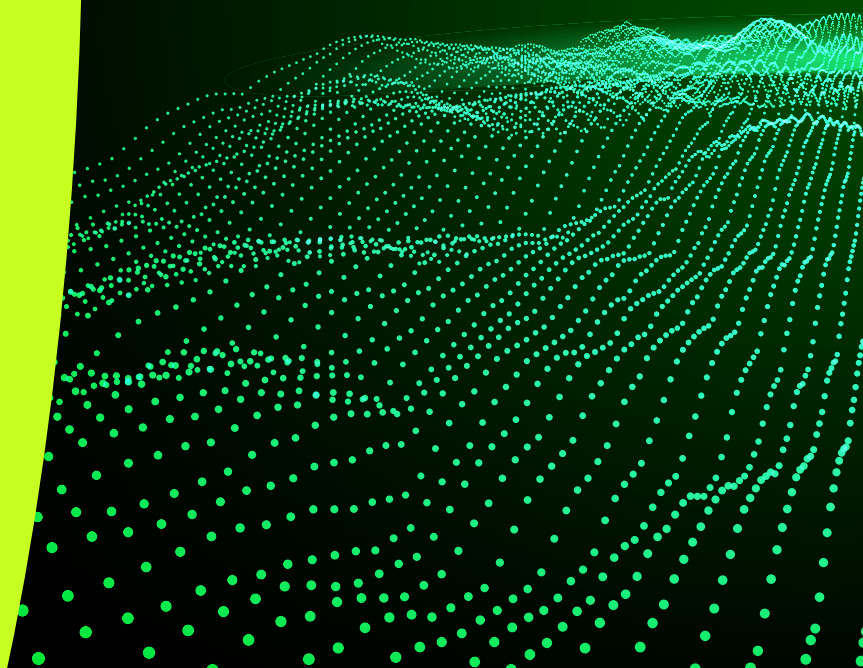
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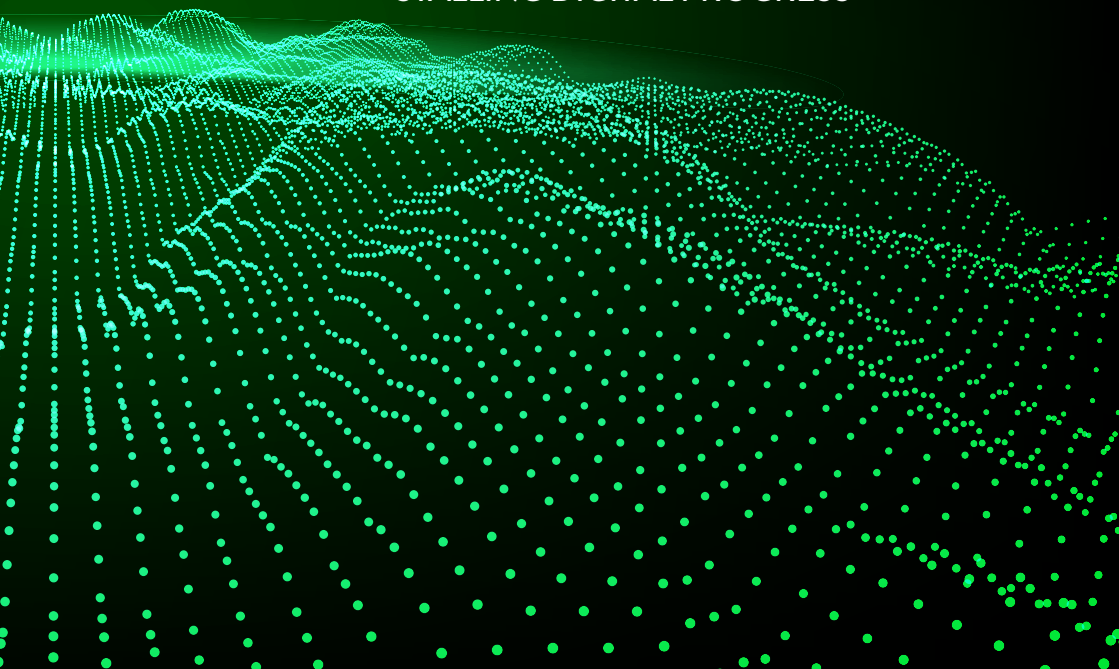
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Watt's up?

WHAT NEEDS TO BE DONE
TO STOP GRID BOTTLENECKS
STALLING DIGITAL PROGRESS





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Watch It Now

6

ROB'S BLOG

Delivering the goods

8

NEWS

All that's happening in the world of enterprise and data centre network infrastructures



28

CHANNEL UPDATE

Moves, adds and changes in the channel



32

SUSTAINABLE NETWORK INFRASTRUCTURES

Jon Healy of Salute examines how the data centre sector is now looking at sustainability data as more than a reporting measure by using it to make operational decisions

14

MAILBOX

The pick of the recent emails to Inside_Networks



17

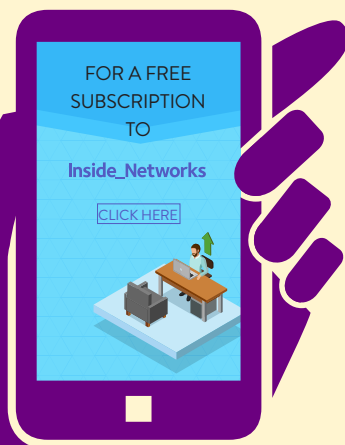
QUESTION TIME

Industry experts discuss what governments and utilities should be doing to address the issue of soaring data centre demand and available energy supply

36

SUSTAINABLE NETWORK INFRASTRUCTURE SOLUTIONS

A selection of the very best sustainable network infrastructure solutions currently available



38

SUSTAINABLE NETWORK INFRASTRUCTURES

As organisations do their bit to drive improvements in sustainability, Rob Kelly of Sudlows explains why modern network infrastructures are an integral part of the story



42

SUSTAINABLE NETWORK INFRASTRUCTURES

Jonas Güresir of R&M explains the steps, regulations and challenges associated with integrating circularity into the value chain

46

KNOWLEDGE BANK

Carrie Goetz tackles the big question – what is liquid cooling and why use it?

48

SPOTLIGHT

Rob Shepherd catches up with Simon Taylor and talks to him about his life and career, and why data centre operators need to be more environmentally accountable

52

QUICK CLICKS

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

54

EDGE DATA CENTRES

With data centre capacity moving to the edge, Stuart Crump of LiquidStack looks at how liquid cooling will shape-up

58

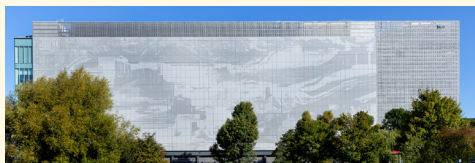
EDGE DATA CENTRE SOLUTIONS

State-of-the-art solutions for edge data centres

60

EDGE DATA CENTRES

Eaton's Juan Colina looks at why modular data centres are the key to ensuring business agility in the age of AI



64

PROJECTS AND CONTRACTS

Case studies and contract wins from around the globe

66

PRODUCTS AND SERVICES

The latest network infrastructure products, systems and services

69

FINAL WORD

Steve Clifford of Emcor UK looks at why retrofitting is reshaping the data centre landscape



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Data centres designed for artificial intelligence (AI) workloads are being constructed at a furious pace – and are placing huge demands on already stretched electricity grids. In fact, the speed of this expansion has created a situation where power availability in some locations has become a significant bottleneck and governments have implemented rules aimed at easing pressure on the national electricity grid.

However, grid capacity and connection must be central to national growth strategies. If they aren't, AI's potential will be capped not by technology but by the power we fail to deliver. With the clock is ticking, in this month's Question Time we've asked a specially selected panel of industry experts to offer their views on what needs to be done to address the issue of soaring data centre demand and available energy supply.

Sustainability remains an important industry discussion point and we have three articles on the subject. Jon Healy of Salute examines how the data centre sector is now looking at sustainability data as more than a reporting measure by using it to make operational decisions. Jon's followed by Rob Kelly of Sudlows, who explains why network infrastructure is an integral part of an organisation's sustainability story, while Jonas Güresir of R&M look at the steps, regulations and challenges associated with integrating circularity into the value chain.

As digital transformation continues there is increasing need for compute power at the edge. Eaton's Juan Colina explains why modular data centres are the key to ensuring business agility in the age of AI, while Stuart Crump of LiquidStack looks at how liquid cooling will shape-up as data centre capacity moves to the edge.

I recently had the pleasure of catching up with industry pioneer Simon Taylor. Simon's now working hard to revolutionise the way precious metals are redistributed to the circular economy and he thinks the data centre sector needs to do much more on this issue. You can read my interview with him in this edition.

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

Rob Shepherd

Editor



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DC Interconnect Solutions

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Cable | Patch Cord and Pigtail | Patch Panel

C

DC Core Fibre Optic Cabling System (ISP)

Trunk Cable Assembly
MPO Trunk & Array Cords
PO Cassette | MPO Cassette
Panel | Patch Cord
and Pigtail

D

Copper Cabling System

Cable | Patch Cord
Jack Module
Face Plate
Jack Panel

Entrance Facility & MMR

A

B

C

C

Data Hall #1

Meeting Room

D

Staging Room

D

Electric Room

D

Data Hall #2

C

NOC & BMS

D

Lobby

D

Security

D

Conference room

D



Renewables hold the key to public support for data centres

Alpaca Communications has published the results of a survey conducted by YouGov which reveals that while the UK public is broadly supportive of new data centre development, this support is conditional. The research, supported by TechUK, highlights a striking gap in public awareness in that most people don't know what data centres are or why they matter, despite relying on them daily.

It found that 75 per cent of people support data centres powered by renewable energy, compared with 40

per cent for nuclear and just 20 per cent for fossil fuels. Meanwhile, only eight per cent of the public say they 'know a lot' about data centres and 27 per cent have never heard of them at all. 52 per cent support more data centres nationally, but support falls to 44 per cent locally.

Peter Elms, founder and director at Alpaca Communications, said, 'Data centres are the critical infrastructure powering the UK's

AI revolution but they're invisible to the public. The sector has a choice – keep quiet and risk opposition, or go green, engage locally and earn trust.'



84 per cent of businesses report rising network outages over past two years

84 per cent of organisations have experienced an increase in network outages over the past two years, with more than a quarter reporting increases of 25-50 per cent, according to research from Opengear. The survey polled over 1,000 chief information officers, chief security officers and network engineers across the UK, US, France, Germany and Australia.

Network engineers identified the most common causes of these outages as device configuration changes (27 per cent) and server hardware

failures (26 per cent), both of which can severely impact the stability and performance of data centres. To mitigate these risks, 32 per cent rank AI and

machine learning technologies among the technologies they have primarily invested in to support data centre operations.

Patrick Quirk, president and general manager at Opengear, said, 'Outages are no longer isolated events. They are happening more often and the cost is hitting businesses hard. Complexity, aging infrastructure, human error and cyberattacks are all part of the problem. As organisations lean more heavily on data centres to power digital

transformation, the stakes are higher than ever.'



'AI' and 'digital transformation' amongst the most hated buzzwords for IT pros

Research from SolarWinds has highlighted the everyday irritations, buzzword fatigue and quiet frustrations felt by IT professionals across the globe. The survey of 437 IT professionals reveals a workforce that feels overlooked, underappreciated and irritated by their colleagues.

The jargon being used in offices up and down the country isn't helping either. 31 per cent say that 'AI' is the buzzword most likely to make them want to throw their monitor out the window, followed by 'digital transformation' (15 per cent) and

'seamless integration' (13 per cent). 19 per cent say that hearing either 'I didn't touch anything' or 'you're good with computers, right?' makes their soul want to leave their body. That's closely followed by 'the Wi-Fi's broken' (18 per cent).

Sascha Giese, tech evangelist at SolarWinds, said, 'IT professionals keep networks secure, services running and hybrid work alive. But it's often without fanfare and usually without thanks. Instead, they're constantly bombarded with frustrating jargon, unrealistic demands and phrases that make their blood boil.'



Sascha Giese

AI adoption stalls in large enterprises but grows across all companies

Falling from a peak of around 14 per cent to 12 per cent, AI adoption among large enterprises – those with more than 250 employees – has dipped slightly, according to recent data from the US Census Bureau. This small decline suggests some hesitation among large companies, potentially driven by frustrations over unclear returns on investment (ROI) despite significant spending on AI infrastructure including massive investments in data centres and AI rollout support.

The survey tracks responses from 1.2 million US companies. Currently, 9.7 per cent of respondents report using AI in the last two weeks, up from 8.8 per cent in the previous survey. Expectations for AI adoption in the next six months are also rising, with 13.7 per cent of companies planning to implement AI for producing goods or services. However, nearly two-

thirds of companies do not expect to use AI in that period, highlighting that widespread adoption is still emerging.

Andy Ward, senior vice president international at Absolute Security, commented, 'Reports of large enterprises pulling back on AI adoption highlight a growing concern, so much so that businesses are starting to question the ROI. AI can transform detection and response, but if it's deployed without robust resilience strategies, real-time visibility and clear governance, it risks adding more vulnerabilities than it solves.'



Andy Ward

Microgrids are the driving force behind data centre expansion and Europe's energy transition

A combination of renewables, grid balancing engines and energy storage make for the most cost effective microgrids to power data centres, while also cutting emissions and providing vital grid balancing to enable the energy transition. This is according to new research from Wärtsilä and AVK.

Their analysis finds that powering the data centres across Europe by optimised microgrids could create a significant bank of dispatchable power, supporting the entire continent's energy transition. The rapid growth of AI is driving increased demand for data centres across Europe, which is expected

to increase by 250 per cent by 2030, from 10GW to 35GW. With the continent's grid facing constraints from high energy prices and bloated grid connection queues, data centre operators are increasingly turning to off-grid solutions to power these energy intensive assets.

AVK's CEO, Ben Pritchard, said, 'The answer to the challenges we face in combatting climate change is as much to

do with changing behaviours as developing new technologies. And the key to behavioural change is the recognition that there are different ways of doing things.'



Ben Pritchard

Jack Hawkins is this year's winner of the ECA Edmundson Apprentice of the Year award

Jack Hawkins from Camelot Electrical has been announced as this year's winner of the ECA Edmundson Apprentice of the Year award. Hawkins was among three finalists in this golden anniversary year for the awards. He impressed the judges at the in-person interview, showcasing how he can be a role model for the next generation of engineering apprentices.

Ruth Devine, ECA president, said, 'Jack embodies all the values we would expect, and more, of apprentices. His knowledge and passion for the industry shows just

how vital his contribution will be to the future of electrification in the UK. It was very clear how driven he is and he will be a remarkable role model for current and future apprentices to look up to.'



Jack Hawkins

Salary survey finds pay rises aren't enough to retain data centre industry talent

DataX Connect has released the results of its 2025 Data Centre Salary Survey. The study, which draws on insights from over 1,500 data centre professionals across Europe and the US, reveals an industry that continues to offer strong pay and rapid progression but also faces challenges around retention, satisfaction and pay fairness.

With demand for digital infrastructure only increasing, competition for skilled talent is fiercer than ever. The report shows that while salaries are rising, money alone is no longer enough to keep professionals engaged. One in five professionals who received a pay increase last year still plan to leave their role,

with around 40 per cent of respondents intending to change jobs within the next 12 months.



The gender pay gap also persists across all levels of seniority, highlighting the need for fairer and more transparent pay practices and stronger leadership pipelines for women. Meanwhile, one in five professionals with less than five years' experience, and 30 per cent of under 35s, already hold senior roles.

The findings highlight that, while the data centre sector is a lucrative industry, the next 12 months could contain a critical turning point. 'The industry's doing well, but salary alone won't solve the bigger challenges,' said Andy Davis, director at DataX Connect.

NEWS IN BRIEF

Stellium Datacenters' Cobalt Park data centre campus is to be designated as an AI Growth Zone by the UK government.

Digital Realty and Oxford Quantum Circuits (OQC) have launched the first quantum AI data centre in New York City, located at Digital Realty's JFK10 facility and built with Nvidia GH200 Grace Hopper Superchips.

Nvidia is to invest up to \$100bn in OpenAI and supply it with data centre chips. The move underscores the increasingly overlapping interests of the various tech giants developing advanced AI systems.

ODATA, an Aligned Data Centers company, has announced \$1.02bn in green financing, focused on sustainable data centre infrastructure investments. With this financing – the largest of its kind for data centres in Latin America – ODATA reaches a total of \$2.25bn in financing, further strengthening its financial foundation.

Vantage Data Centers has secured a \$1.6bn investment to scale its Asia-Pacific platform.



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Why GPT-5 is the shape

Hi Rob

I'm writing to you about the arrival of GPT-5 and how it has left many people fearing for their jobs. I think your readers will agree that where large language models (LLMs), automation and machine learning have been reshaping business operations, we have truly entered the unknown.

I don't think people should be scared of advances in innovation, rather they should be asking what artificial intelligence (AI) can do for them. I have found that those who thrive in disruptive eras aren't always the most technical but the most adaptable.

Workers shouldn't be afraid of AI but they should focus on how they can utilise it. Whether readers are in tech, finance, marketing or any field in between, I would like to share some tips for keeping up the pace with AI.

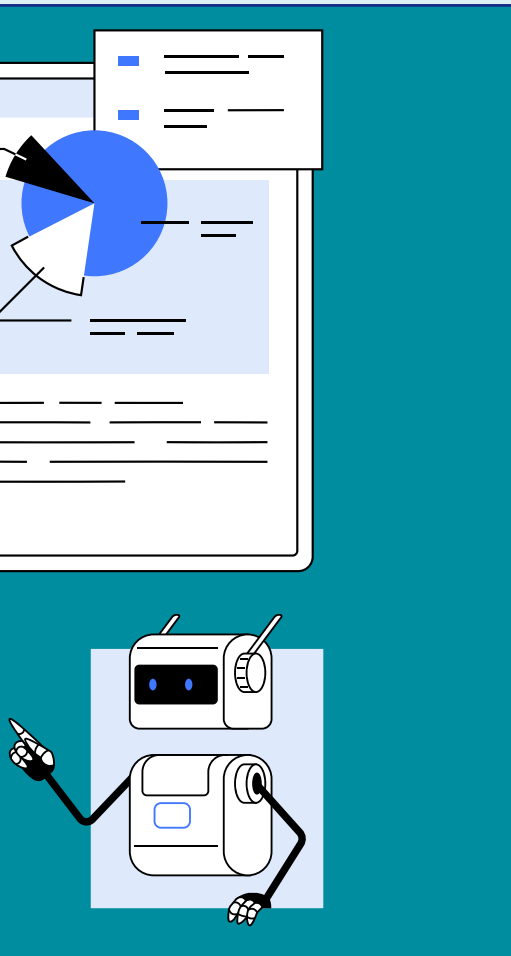
Firstly, I think everyone, everywhere, needs to understand the basics of AI, even if they're not technically minded. You don't need to be an engineer to use AI effectively, but you do need to understand how it functions. Workers should focus their energy on learning about neural networks, transformers or prompt engineering. There are many free resources available to help workers get a better handle on it, including DeepLearning.AI's short courses or the Khan Academy's AI modules. These are a great place to start.

Integrating AI into your daily workflow is another suggestion. With innovation moving at such a rapid pace, I recommend workers start experimenting with it now. Try using AI for note-taking, summarising documents, prototyping ideas or accelerating research efforts.



When it comes to AI adoption and understanding, people need to stay curious and not be so defensive. Today's workers need to be AI-aware and find ways of embracing and keeping pace with technology. When ChatGPT first launched, people were awestruck but worried. Resisting change only puts you further

...e of things to come



behind. I would advise everyone to try use cases within their workflow and don't be afraid to explore how AI can help free you up to focus on more important work.

Investing in your own human soft skills is so important. Creativity, empathy, judgement and leadership are going to become of significant value to

organisations. The rise of AI is making these capabilities more essential. Cultivating them is how you stay relevant and irreplaceable.

People must not be afraid to share their AI knowledge. AI impacts every aspect of business – from marketing to production to human resources and operations. The most effective organisations are those where there is shared knowledge of AI. Therefore, it makes sense to encourage teams to work more collaboratively when it comes to innovation.

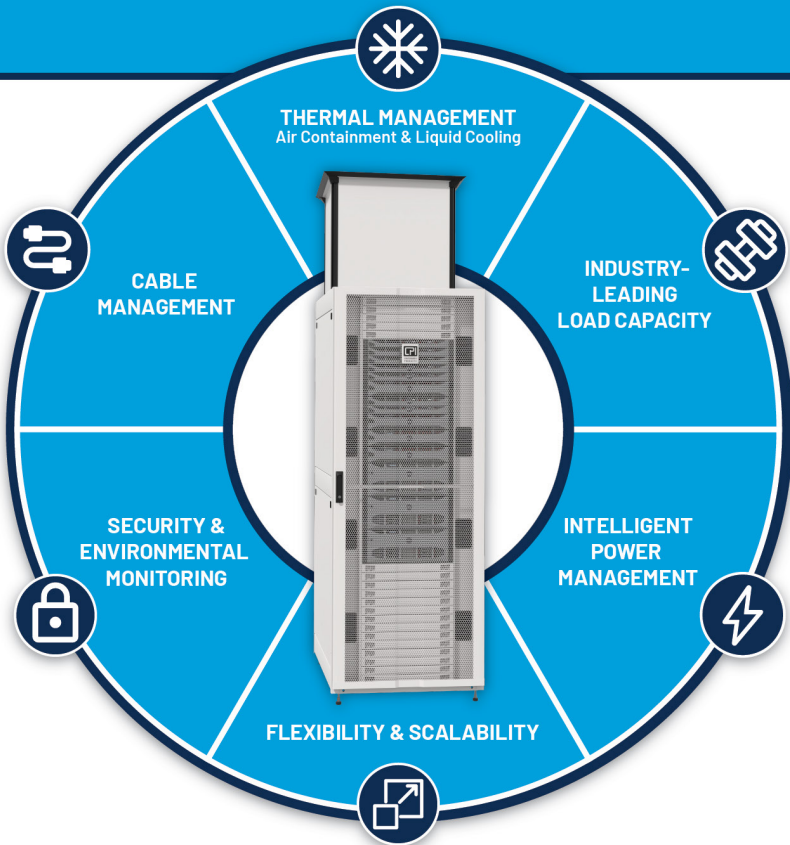
Going forward, people need to ensure their careers are in constant iteration. My advice to fearful readers would be to subscribe to AI newsletters, join webinars and do courses. Tech is going to keep moving and so should your learning habits.

We are entering an era where those who partner with AI will massively outperform those who don't. The people who will lead tomorrow are those who embrace the change and seize opportunities to upskill.

Tal Barmeir
BlinqIO

Editor's comment

The fear that GPT-5 could replace jobs due to its speed, accuracy and adaptability is very real. However, it's not going away, so users need to embrace it and use it as a collaborative partner that allows them to focus on complex problem solving and strategic decision making. As Tal rightly points out, those who embrace change and actively seek opportunities to enhance their skills stand to gain.



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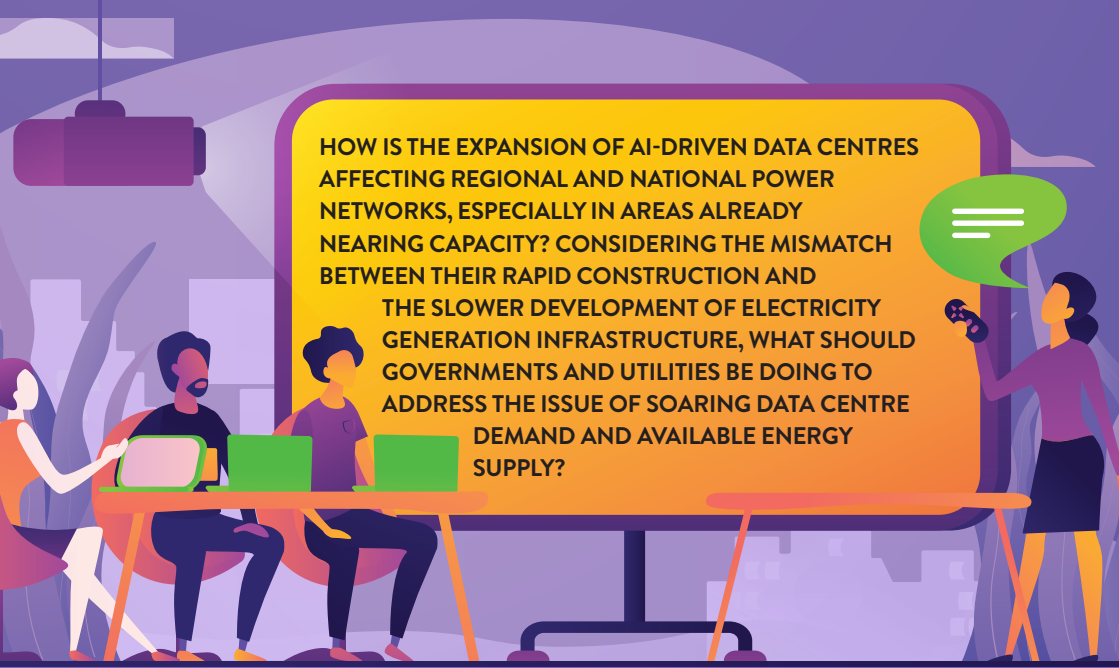
Artificial intelligence (AI) driven data centres are placing unprecedented strain on regional and national power networks. [Inside_Networks](#) has assembled a panel of industry experts to examine what governments and utilities must do to address the issue of soaring data centre demand and available energy supply

▶ As the number of AI-driven data centres grows at a rapid pace, they are placing immense pressure on regional and national power grids, some of which are already approaching their capacity limits. Take Ireland, for example, where according to the country's Central Statistics Office data centres took a 22 per cent share of total energy usage in 2024.

To address this, Ireland's Commission for Regulation of Utilities (CRU) has put forward new rules aimed at easing pressure on the national electricity grid. Under the proposal, any new data centre would be required to supply its own power, either

through generation or storage, equal to its full energy demand. This capacity would need to be located on-site or near the facility.

Other regions, from Virginia in the US to Frankfurt in Germany, are facing similar pressures. Without urgent reform and long-term planning, grid bottlenecks could stall digital progress, increase emissions and deepen regional inequalities in infrastructure investment. To examine the issue in more detail, [Inside_Networks](#) has assembled a panel of experts to offer their views on the subject.



HOW IS THE EXPANSION OF AI-DRIVEN DATA CENTRES AFFECTING REGIONAL AND NATIONAL POWER NETWORKS, ESPECIALLY IN AREAS ALREADY NEARING CAPACITY? CONSIDERING THE MISMATCH BETWEEN THEIR RAPID CONSTRUCTION AND THE SLOWER DEVELOPMENT OF ELECTRICITY GENERATION INFRASTRUCTURE, WHAT SHOULD GOVERNMENTS AND UTILITIES BE DOING TO ADDRESS THE ISSUE OF SOARING DATA CENTRE DEMAND AND AVAILABLE ENERGY SUPPLY?

STEVEN FOSTER

VICE PRESIDENT OF SALES EUROPE & CENTRAL ASIA AT SIEMON

In my three decades in the industry, I've never seen anything scale as fast as AI. Data centres built for AI workloads are going up at record speed. They're denser, more powerful and hungrier for energy than traditional facilities – and the grids supporting them are already stretched thin.

In the Frankfurt, London, Amsterdam, Paris and Dublin (FLAP-D) markets access to power has become a critical obstacle. AI-focused facilities are driving higher rack densities, sustained high loads and greater cooling requirements, compounding the strain on already limited capacity.

In Dublin, a de-facto pause on new grid connections is expected to last for years. London faces multi-year waits, Amsterdam has restricted major builds and Frankfurt is showing signs of reaching its limits. As delays mount, the risk isn't just stalled AI projects – it's a slowdown in the wider digital economy in these regions.

We're seeing a shift from primary markets to emerging secondary, and even tertiary, locations as developers chase faster timelines and secure energy availability. This redistribution of investment could reshape the European data centre map.

There's no single fix. However, I think there are actions governments and utilities can take now to slow the gap between AI-driven demand and available power.

First, accelerate grid upgrades and reform connection processes, prioritising

construction ready projects and removing stalled ones from the queue. The UK's Connections Action Plan, now reinforced by Ofgem's 'first-ready, first-connected' rule, is a solid step, but unless it's rolled out quickly, it risks becoming just another plan gathering dust.

Second, enable more local generation – solar, wind, battery storage and, in future, small modular reactors – to reduce reliance on overstretched transmission networks. Third, link planning approval directly to proven energy availability, as seen in the UK's AI Growth Zones, which join digital infrastructure policy with power strategy.

The industry has a role too. High density, energy efficient infrastructure lets operators get more computing power from the same electrical footprint and move quickly when capacity becomes available. If policy, power and smarter infrastructure align, Europe can keep pace with AI growth, without letting the grid become its biggest bottleneck.



'WE'RE SEEING A SHIFT FROM PRIMARY MARKETS TO EMERGING SECONDARY, AND EVEN TERTIARY, LOCATIONS AS DEVELOPERS CHASE FASTER TIMELINES AND SECURE ENERGY AVAILABILITY. THIS REDISTRIBUTION OF INVESTMENT COULD RESHAPE THE EUROPEAN DATA CENTRE MAP.'



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JOHN BOOTH

MANAGING DIRECTOR AT CARBON3IT

According to recent research, in the UK there is over 7GW of new data centre capacity either under construction, shovel ready or at early stage. However, not all of this will be granted planning permission and this will be due to power constraints.

The National Grid is already busy with the Great Grid Upgrade, which comprises 17 major infrastructure projects that will both scale-up the grid and update existing networks. The key point here is that most of them pre-date AI data centre proposals and are largely to carry clean energy from renewable sources. So, potentially, data centre developers and operators will have to pay for new connections or go 'behind the meter', meaning off-grid.

Unfortunately, a lot of the proposed new data centre projects are in London and the South East of England, where grid constraints and potentially water constraints are at their highest, and this is why any new capacity should be put where there is ample supply of both grid power and water, such as the Midlands, the North and Scotland. It appears that steps are being taken to do exactly that.

One other consideration is that the rise of the 'braggawatt' data centre is due largely to one chip manufacturer's designs. I'm sure that, in time, the other chip

manufacturers will bring out more energy efficient designs, potentially producing less heat, meaning less energy overall. This should be taken into consideration.

Government should provide planning guidance and clarity on planning permissions, especially taking into account other initiatives such as heat networks. This needs to be developed sooner rather than later and be part of national and regional master planning.

However, these plans will come to nothing if government and the sectors fail to invest in people. For too long science, technology, engineering and mathematics (STEM) skills have been left behind, and this has resulted in the current

shortages in the construction, high voltage distribution and data centre sectors, which must be addressed if we are to become an AI powerhouse.



'FOR TOO LONG STEM SKILLS HAVE BEEN LEFT BEHIND, AND THIS HAS RESULTED IN THE CURRENT SHORTAGES IN THE CONSTRUCTION, HIGH VOLTAGE DISTRIBUTION AND DATA CENTRE SECTORS, WHICH MUST BE ADDRESSED IF WE ARE TO BECOME AN AI POWERHOUSE.'



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EMMA FRYER

DIRECTOR OF PUBLIC POLICY EUROPE AT CYRUSONE

As we all know, the problem is not a lack of capacity to generate electricity but getting enough power across infrastructure bottlenecks to where it's needed. The clustered distribution of data centres has created demand that will not be satisfied until the late 2030s.

The policy response in the UK and EU (logical for anyone unfamiliar with the industry) is to re-engineer the locational attributes of data centres and move activity to where there is power, by creating AI Growth Zones. However, only certain types of advanced computing are location agnostic enough to take advantage of cheap renewable power. UK government will need to introduce strong market signals to attract large AI training workloads to UK locations – even those with plentiful renewable supply.

We know how we got into this mess in the UK – the tendency to overprocure, the regulatory constraints that meant new capacity could only be supplied reactively, and lots of speculative activity have created a tragedy of the commons. Developers must weather delay and uncertainty and urgently need contractual accountability and transparency to help them manage investment risk. This is being addressed through reform, but at glacial speed.

Some think that more efficient computing could have a transformational effect on sector electricity demand, but this is unlikely to be the solution. The power

required to process a given amount of data has already decreased by around six orders of magnitude over the last three decades – yet demand has grown inexorably, thanks to the Jevons paradox. However, perhaps we should consider a more fundamental

paradox in terms of the way we provision our power.

As a sector we demand 100 per cent reliability of our electricity supply. This requirement adds a disproportionate burden to the system which could, with much less effort, provide most of the power all of the time, or all of the power

most of the time, but we insist on all of the power all of the time even though we actually want to use all that power almost none of the time. Is there really nothing we can do collectively to address this particular disconnect?



'SOME THINK THAT MORE EFFICIENT COMPUTING COULD HAVE A TRANSFORMATIONAL EFFECT ON SECTOR ELECTRICITY DEMAND, BUT THIS IS UNLIKELY TO BE THE SOLUTION. THE POWER REQUIRED TO PROCESS A GIVEN AMOUNT OF DATA HAS ALREADY DECREASED BY AROUND SIX ORDERS OF MAGNITUDE OVER THE LAST THREE DECADES – YET DEMAND HAS GROWN INEXORABLY'

JON LABAN

FREELANCE CREATIVE SYSTEMS THINKER



The burgeoning growth of AI-driven data centres is placing significant strain on regional and national power networks.

These facilities demand massive, continuous electricity supply – far exceeding that of traditional data centres and compete with other burgeoning loads like electric vehicles and manufacturing.

The problem is further exacerbated by the disparity between the speed of data centre construction and the slower pace of new generation and grid infrastructure development. This mismatch leads to overloaded grids, delays in connecting new facilities and potential compromises on decarbonisation goals as utilities struggle to meet demand.

Governments should:

- **Establish strategic planning.** Develop national and regional strategies that identify optimal locations for data centres, considering grid availability, renewable energy potential and other infrastructure needs.
- **Streamline permitting and siting.** Implement reforms to accelerate the approval and construction of both data centres and associated power infrastructure.
- **Incentivise sustainable solutions.** Offer tax breaks and other incentives for data centres to invest in energy efficient

technologies, renewable energy sources and grid friendly solutions like on-site generation and energy storage.

- **Improve grid modernisation funding.** Allocate adequate funding and resources to accelerate grid upgrades including transmission capacity expansion and incorporating new technologies like smart grids and advanced control systems.

Utilities should:

- **Offer strategic siting guidance.** Guide data centre developers towards locations with sufficient grid capacity and proximity to renewable energy resources.
- **Develop innovative connection solutions.** Offer flexible grid connection options that allow data centres to participate in demand response programs and better manage their energy consumption in response to grid conditions.
- **Collaborate on infrastructure development.** Work with data centre developers to proactively plan and invest in the necessary grid reinforcements and infrastructure upgrades.
- **Invest in renewable energy and storage.** Expand renewable energy generation capacity and implement energy storage solutions to meet the growing demand for clean and reliable power from data centres.

‘OFFER TAX BREAKS AND OTHER INCENTIVES FOR DATA CENTRES TO INVEST IN ENERGY EFFICIENT TECHNOLOGIES, RENEWABLE ENERGY SOURCES AND GRID FRIENDLY SOLUTIONS LIKE ON-SITE GENERATION AND ENERGY STORAGE.’

MARK YEELES

VICE PRESIDENT SECURE POWER DIVISION AT SCHNEIDER ELECTRIC UK&I

Data centres support every aspect of our digital society and economy. The growth of AI has only emphasised the criticality of data infrastructure, as characterised by the UK government's AI Opportunities Action Plan. However, these developments have placed additional loads on energy infrastructure.

Between 2010-2020, data centre electricity consumption remained flat despite exponential data growth. Since 2020, however, industry forecast models project significant growth through 2030. In our research, we used a method that correlates annual information and compute technology (ICT) energy consumption with annual data production to frame the conversation between infrastructure and ICT technology providers.

This disruption in compute efficiency from 2020 is projected to be followed by recovery by 2026, with impact visible by 2030. We found that small improvements over currently planned projections in Power Usage Effectiveness (PUE) and compute efficiency from 2026 can potentially 'bend' the energy growth curve by 17 per cent, decoupling data growth from compute energy consumption. AI will be a vital tool in ensuring this efficiency and constant optimisation both in the data centre and in energy grids.

A recent IDC survey found nearly a third of respondents (29 per cent) cite software tools as leading sustainability efforts. Across the globe, there are numerous

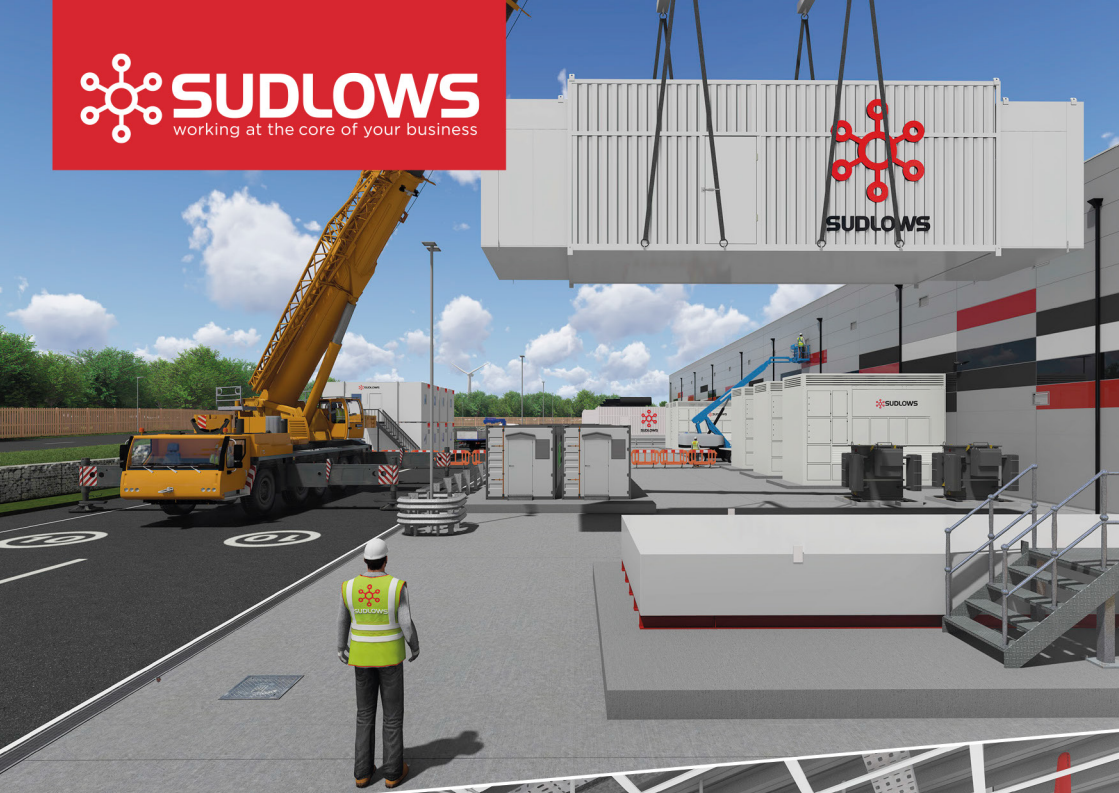
examples such as the Wellcome Sanger Institute, which has used software to reduce 33 per cent of data centre related energy consumption.



When this trend is matched with the increasing use of on-site energy generation for large energy consumers, the combination of efficiency and greater grid independence means data centres can support developing grids in becoming more digital, bringing ever greater supplies of renewable energy sources online. Governments, local authorities and utilities

can work together to support more large consumers in becoming prosumers, accommodating on-site energy generation that can supplement grid needs, or operating independently to relieve strain in constrained areas. These prosumers can also provide vital balancing services to grids, accelerating renewable energy sources adoption while lowering costs.

'GOVERNMENTS, LOCAL AUTHORITIES AND UTILITIES CAN WORK TOGETHER TO SUPPORT MORE LARGE CONSUMERS IN BECOMING PROSUMERS, ACCOMMODATING ON-SITE ENERGY GENERATION THAT CAN SUPPLEMENT GRID NEEDS, OR OPERATING INDEPENDENTLY TO RELIEVE STRAIN IN CONSTRAINED AREAS.'



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DAVID KNOX

GLOBAL DIRECTOR OF ENERGY & SUSTAINABILITY AT COLT DCS

The expansion of AI-driven data centres is placing significant and growing pressure on regional and national power networks. These data centres require continuous, high capacity electricity to power the advanced compute infrastructure behind AI, cloud platforms and other digital technologies.

However, electricity demand is now rising faster than the pace of infrastructure development. In areas already close to capacity, delays in securing grid connections are creating bottlenecks that could stall billions in digital investment, restrict innovation and undermine our national economic goals.

This issue stems from a structural mismatch between build timelines and infrastructure readiness. Data centres can often be planned, approved and constructed in 2-3 years. In contrast, major grid upgrades, including new generation assets or transmission lines, can take 5-10.

If this gap is not addressed, power availability – not appetite, demand, capital, expertise or planning – will be the main constraint on digital growth. Governments and utilities companies must treat grid capacity and connection certainty as core components of a national growth strategy. This means reforming the grid connection process to make it faster and more transparent, as well as introducing prioritisation frameworks for critical digital infrastructure. Energy planning must be



aligned with national goals for AI, cloud and digital resilience, not developed in isolation.

In parallel, a more ambitious and collaborative approach is needed. Utilities should invest in smarter forecasting tools, collaborate earlier with developers and prepare to meet concentrated pockets of energy

demand. Investment in clean generation and upgraded transmission is also critical to accelerating and supporting long-term digital needs.

Data centres are no longer niche facilities. They are the foundation of our economies. Ensuring they can be powered reliably, sustainably, efficiently and on time is now a matter of national strategic importance. Powering AI means creating the infrastructure that sits behind it.

'GOVERNMENTS AND UTILITIES COMPANIES MUST TREAT GRID CAPACITY AND CONNECTION CERTAINTY AS CORE COMPONENTS OF A NATIONAL GROWTH STRATEGY. THIS MEANS REFORMING THE GRID CONNECTION PROCESS TO MAKE IT FASTER AND MORE TRANSPARENT, AS WELL AS INTRODUCING PRIORITISATION FRAMEWORKS FOR CRITICAL DIGITAL INFRASTRUCTURE.'

«Connecting the Planet»

For us, connectivity is not just defined by product solutions. It is about actively shaping society and promoting its sustainable progress through the exchange of data and knowledge.

«Connecting the Planet» is our company-wide sustainability program. It connects our vision of «unlimited communication» and our mission «Connectivity that matters» with corporate responsibility.



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Falk Weinreich appointed group CEO at Portus Data Centers

Portus Data Centers has appointed Falk Weinreich as its new group CEO. He is a proven industry expert and joins Portus from OVHcloud where he was general manager Central Europe. Weinreich brings extensive experience in building regional infrastructures, energy efficient data centres and high performance IT environments with rapid response times.

Weinreich said, 'Portus Data Centers has quickly positioned itself as one of the most important providers in the regional colocation sector. We want



to leverage this momentum to further expand our presence and develop new capacities. Together with Arcus as a strategic partner, we are investing in energy efficient infrastructure solutions close to our customers and are specifically strengthening key technology and business locations.

As a result, we are

making an important contribution to digital sovereignty in Europe.'

Paul Hood joins AVK as chief operating officer

AVK has appointed Paul Hood as its new chief operating officer. He brings extensive industry experience from senior roles with Yondr Group and Pure Data Centres Group, plus 13 years at JP Morgan where he managed the entire data centre infrastructure across EMEA with a \$90mn operating budget.

Hood commented, 'I've known AVK for 30 years and I understand exactly where the company has come from and where it is going in this incredibly competitive industry. I am delighted to be



working with some of the most committed infrastructure engineers in the world. I told Yondr I would build them a global business that they could be proud of and that's exactly what I did. I leave that company with fond memories having been

there from the start but it's time to move on and I'm now incredibly excited about what's in store for me at AVK.'

Black & White Engineering to create 60 new jobs in Dublin

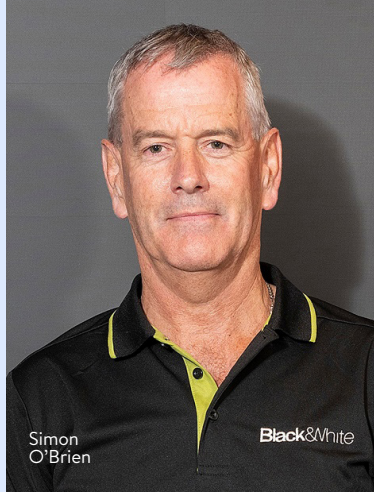
Black & White Engineering is set to create 60 new high-tech engineering jobs in Dublin. The company recently completed the acquisition of Homan O'Brien, one of Ireland's longest established consulting engineering firms, which marks Black & White's first European acquisition and a significant investment in the Irish market.

Homan O'Brien traces its roots back more than 65 years through the merger of Robert Jacob and Partners (founded in 1955) and Seamus Homan Associates (founded in 1978). It has built a strong reputation across healthcare,

education, laboratories, commercial, residential and industrial sectors, in addition to its expertise in data centres.

Simon O'Brien, country director Ireland at Black & White Engineering, said, 'We're currently 32 people in Dublin and over the next three years we plan to grow the team to around 90. That's 60 new high-tech engineering jobs and a real investment in Irish talent and skills. For our clients, it means continuity and stability

with the same level of service we've always provided, while giving us the scale and support of a global network.'



Mayflex strengthens its external security team with two key appointments

Mayflex has strengthened its external security team with the addition of two new experienced and accomplished recruits. Jason Cooke joins from Wavestore where he was a regional sales manager and prior to that he worked at Pelco as a channel account manager. Matt McLernon joins Mayflex from Veracity UK where he was the UK sales manager.

Francesco Bellavia, director of sales for security at Mayflex, commented, 'We are delighted to welcome Jason and Matt to the team. Both have been in the security



industry for many years and have a wealth of experience, a focus on customer service and the desire to succeed, which is the perfect fit for our "driven to deliver more" philosophy.'

BCS appoints associate director across DACH region to support continued expansion

BCS has appointed Marcel Reifschneider-Hicker as an associate director to support its continued and planned expansion in Germany, Austria and Switzerland (DACH). Based in the Vienna office, he will focus on supporting the company's full range of data centre services, working with both established clients in the region and new entrants to the market.

Highly experienced in all commercial aspects of real estate development, Reifschneider-Hicker has had senior cost and project roles in several international organisations. He commented, 'BCS' unrivalled expertise in



Marcel
Reifschneider-
Hicker

this fast-moving sector and its culture and approach makes this role an exciting and attractive next step for me. This region presents unique challenges and I am confident my skills and experience will help address them. I am committed to excellence and look forward to playing a key role

in the company's continued growth and success.'

CHANNEL UPDATE IN BRIEF

Zayo Europe has appointed Davin Rice as chief business development and strategy officer. He'll oversee Zayo Europe's corporate development and business development teams, driving long-term partnerships, investment strategies and market expansion initiatives.

Trackunit has strengthened its board of directors with the appointment of Tod Nielsen as chair and Roland Zelles as a new board member.

Asanti Data Centres has announced that Sumillion has joined its expanding network of partners through Northamber.


CMC Networks has appointed Mahesh Jaishankar as managing director. He will lead the company's strategy to drive growth in AI-powered connectivity, combined with on the ground expertise across Africa and the Middle East.

LiquidStack has appointed three key executives. Ersson Zapata is chief operating officer, Mike Tapp joins as chief financial officer and Ed King is promoted to chief innovation officer.

Gigamon has appointed Sam Lambert as its new EMEA channel director. He brings a proven track record at Gigamon and in his new position will continue to further advance the Gigamon Catalyst Partner Program and oversee the expansion of its Partner Margin Programme across EMEA.

Make the connection

David De Craemer, CEO at Aginode, explains how the company is powering AI and the digital era with high quality connectivity

 Real-time, uninterrupted data processing and seamless cloud connectivity are foundational in today's hyperconnected world. As the AI industry expands, data volumes are growing exponentially, placing unprecedented demands on network infrastructure – especially in complex environments such as data centres, cloud platforms and smart factories. Connectivity is more than cabling, it's a strategic asset that determines system performance and operational resilience.

Demand for specialised cabling has surged but needs vary significantly across sectors. Instead of taking a one-size-fits-all approach, Aginode delivers custom connectivity solutions that meet specific requirements. In data centres, compact, high speed connections between server racks are vital, for example. In airports, long-distance, flexible configurations are key. In hospitals and university campuses, robust inter-floor and inter-building connectivity is critical. Aginode addresses these needs, and those of other sectors, with ultra-reliable passive and active network architectures, developed in close collaboration with industry stakeholders.

Legacy and global reach

Aginode, headquartered in Paris, brings over a century of network infrastructure expertise, with roots in Alcatel and a legacy within Nexans Group. Spun off in July 2023, we now focus exclusively on data connectivity solutions. We support global digital transformation with copper and fibre solutions for data centres, smart buildings and telecom providers, built on technical precision, sector expertise and a customer-first philosophy. We remain committed to excellence as an independent company.

Our evolving portfolio reflects market trends, shifting toward connectorized, customised, fibre-based solutions, with growth in high-tech manufacturing, data centres and home connectivity. As Aginode continues to strengthen its position, our growth strategy is guided by three core principles – value creation for partners, excellence in execution and adherence to our values: One Team, Drive, and Care. Sustainability is key to Care and we hold an EcoVadis rating, continuously reduce our CO₂



footprint and manufacture close to customers.

Recently, Aginode expanded its Moroccan plant to offer tailored connectorization. Supporting and accelerating this strategic direction in APAC, we inaugurated a state-of-the-art manufacturing facility in Shanghai in December 2024. It was built around the same three pillars as the Morocco facility – high-end copper LAN solutions, pre-terminated data centre fibre connectivity and advanced solutions for other demanding verticals. The Shanghai facility is positioned to be our global engineering hub and LAN and data centre innovation lab.

Strategic expansion Korea: global blueprint

Korea, driven by rapid AI adoption, government backed digital transformation and strong investment in smart infrastructure, is a strategic hub for Aginode. Samsung Electronics – a flagship example – uses our Cat. 6A cabling at its Pyeongtaek semiconductor facility and Gyeong R&D centre. At the Hwaseong HPC Center, which is dedicated to AI and semiconductor computing, Aginode delivered high density optical solutions designed for performance, installation speed and space efficiency. This partnership resulted in three co-developed products and four enhancements in the LANmark ENSPACE line.

The collaboration reflects our global blueprint by focusing on high growth regions, supporting key verticals and delivering customised, reliable connectivity. Our portfolio is evolving in line with market trends, with a growing emphasis on connectorized, fibre-based and tailored solutions across high-tech manufacturing, data centres and the expanding homes-connect telecom segment.

AGINODE'S STRATEGIC GROWTH ROADMAP TO 2030 – FIVE KEY STREAMS

- Target high growth, innovation driven regions
- Pursue a vertical market approach
- Build scalable, ultra-reliable connectivity solutions
- Deepen integration into broadband ecosystem
- Embed agility across all levels of the organisation

Turning knowledge

Jon Healy of Salute examines how the data centre sector is now looking at sustainability data as more than a reporting measure by using it to make operational decisions

▶ For years, sustainability reporting in the data centre sector has focused on metrics such as Power Usage Effectiveness (PUE). Although these figures have played a significant role in forming business strategy, they have all too frequently been dismissed as mere box ticking. However, the industry is now witnessing a significant shift in attitudes to sustainability data – rather than just being a reporting measure, it's now feeding real-time operational decision making.

BEYOND REPORTING

The gap between collecting data and acting upon it is closing as the demand for digital services and artificial intelligence (AI) workloads increases at a rapid rate. The industry can no longer afford to evaluate progress solely based on yearly reports. Instead, data centres are beginning to treat sustainability metrics as live operational tools that can influence the way sites are designed, managed and maintained.

Sustainability measurements were traditionally used to show investors, customers and regulators that a company was compliant and transparent. Although this is still essential, the industry has realised that compliance alone is inadequate to handle the real problems that lie ahead. By 2030, data centre power consumption in Europe is predicted to more than triple from the current level of 62TWh to over 150TWh. Grids that are currently experiencing capacity issues will be under tremendous strain from that expansion.

Metrics are no longer only static figures

found in reports. Instead, they must serve as the foundation for choices that maximise effectiveness, minimise negative impact on the environment and maintain resilience.

OPERATIONAL CHOICES

What is changing is that sustainability data is no longer collected just for reports or compliance. Increasingly, operators are tracking performance in real-time and making adjustments as conditions change. This involves continuously monitoring cooling availability, performance and power consumption, and taking prompt action in the event of problems emerging.

Practically speaking, that can entail redistributing tasks, modifying cooling parameters or alerting engineering teams



ge into action

as soon as something deviates from set limits. The same reporting frameworks that once fed annual disclosures are now being applied live, so that data informs operational teams rather than sitting in a document. This strategy guarantees that goals have a direct influence on how facilities are operated on a daily basis and enables the balancing of sustainability, resilience and cost.

MAKE THE CONNECTION

Sustainability data only has real value when it is directly connected to operators' actions, as reporting figures alone have given way to integrating them into operational procedures. This requires providing teams with clear guidelines to

follow whenever performance deviates from the expected range.

For instance, a procedure should be in place to investigate and modify equipment if cooling performance falls before resilience is impacted. If water consumption unexpectedly increases, teams must have a well-defined plan in place to search for leaks, optimise usage and switch to alternative sources if needed. This shifts the focus from evaluating performance to taking action, guaranteeing that targets lead to tangible outcomes for daily operations.

SUSTAINABILITY WITH RESILIENCE

Although resilience and sustainability are often discussed separately, they are increasingly converging in practice, as data centres can optimise for both by using live metrics to guide decision making. Consider power use as an example – by modifying load profiles based on real-time data, operators can maximise the availability of renewable energy sources while safeguarding vital systems. Data centres can use stored energy, flex demand or workload shifts during grid stress events. By lowering reliance on overloaded grid infrastructure, these measures not only increase sustainability but also resilience.

Although technology and metrics play an important role, humans remain at the centre of operational success, as a team's ability to analyse data and respond proactively underscores the critical importance of training and skills. For instance, training regimes could include



‘The industry is moving in a clear direction – measurements must spur action rather than just sit in reports. Operators can boost sustainability and resilience by using data for predicting issues, monitoring energy consumption, recovering waste heat and quantifying carbon more accurately.’

not only technical operations but also scenario based exercises in interpreting data and responding to anomalies. In order to preserve service continuity and minimise the impact on the environment, data must be driven by human judgement rather than remaining abstract.

SCALING THE STRATEGY

Figuring out how to scale these strategies

across multiple sites and portfolios remains a challenge. Many operators are turning their attention to integrated solutions that centralise data across sites and regions. This facilitates consistency in reporting, decision making and compliance, in addition to offering learning opportunities.

By evaluating performance across sites, operators can identify best practices, see abnormalities and exchange expertise. This



will eventually create an operational model that is more robust and sustainable than the sum of its parts.

REGULATORY PRESSURE

Recent regulatory changes, including the European Union Energy Efficiency Directive, require reporting of waste heat as well as energy use, and stricter national regulations in Germany, the Netherlands and Ireland are pushing operators to embed sustainability metrics more deeply into their operations. Failure to act carries reputational and financial risks, making it clear that for data centres metrics must drive action – not merely be disclosed.

The usage of metrics in data centres will continue to evolve in the future. Instead of waiting for problems to come up, operators are beginning to use predictive analytics to identify potential issues before they arise. To assist sites in controlling demand more flexibly, reducing expenses and maintaining grid stability, metrics are also being linked to energy markets.

Reusing waste heat that can be used for industrial or community purposes is also picking up pace. For example, there's a project under construction in Manchester where waste heat from data centres is going to be used to warm a local swimming pool. Additionally, carbon tracking is seeing a shift from broad estimates to real-time site level data, giving operators both greater visibility and accountability.

FUTURE DIRECTIONS

The industry is moving in a clear direction – measurements must spur action rather than just sit in reports. Operators can boost sustainability and resilience by using data for predicting issues, monitoring energy consumption, recovering waste heat and quantifying carbon more accurately. Businesses should start viewing sustainability metrics as everyday tools that inform choices and generate long-term benefits for customers, communities and the environment, rather than as compliance exercises. ■



JON HEALY

Jon Healy is managing director at Salute and is responsible for the day to day operation of the business with a focus on governance, client engagement, service delivery and performance. Healy has extensive data centre knowledge and expertise within multiple market sectors and has lead projects for some of the world's largest government and private sector organisations.



Networks Centre

Does the choice of network cabling manufacturer affect sustainability?

Unlike some products such as servers, aside from the heat produced by switches which is given off through copper cables, the carbon in cables is all embodied. So, where the raw materials are produced, where the product is assembled, how it's packaged and transported, and where the energy comes from to power all these stages are all major considerations.

The variance in embodied carbon between passive network infrastructure



copper and optical fibre manufacturers is big, with Leviton leading the way in carbon neutral UK manufacturing. It's only a matter of time before the UK government offers direct tax breaks for

products with the lowest embodied carbon used for refurbishment and new build projects.

How can Networks Centre help?

Networks Centre can advise on the advantages offered by each manufacturer.

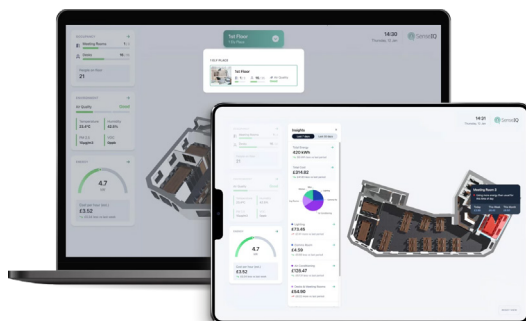
This includes carbon footprint and sustainability achievements and goals, and how we can reduce carbon in transportation and maximise recycling through our pre-staging services.

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

LMG

SenselQ from LMG gives building owners and operators the information they need to make better decisions about how to manage their buildings. The flexible, easy to use technology enables maximum visibility of key building performance data. With a simple to deploy integrated solution, SenselQ has been designed to provide building owners with unique insight into how their buildings are performing and being used.

IoT sensors communicate via wireless gateways to the SenselQ software that



resides either on the user's enterprise network or in the cloud. Building owners and operators can choose to have the solution added

to their network infrastructure or kept entirely separate. They can then monitor temperature, humidity, indoor air quality and energy usage, as well as desk and room occupancy in real-time via SenselQ's network of sensors.

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

Panduit

Panduit's EL2P intelligent power distribution unit (iPDU) is designed to redefine power management standards in mission critical data centre environments.

As organisations accelerate digital transformation and AI workloads drive rack power densities to unprecedented levels, the EL2P series empowers data centre operators to maintain uptime, optimise capacity and enhance sustainability



without compromise. It integrates advanced metering accuracy, robust cybersecurity, flexible outlet configurations and comprehensive environmental sensing.

The EL2P iPDU's integrated colour touchscreen streamlines local management, while an accelerometer enables automatic UI rotation for top or bottom fed installations, enhancing technician efficiency and installation flexibility. It is designed for unmatched metering accuracy of ± 0.5 per cent, ensuring precise energy consumption data for effective capacity planning, Power Usage Effectiveness (PUE) optimisation and sustainability initiatives.

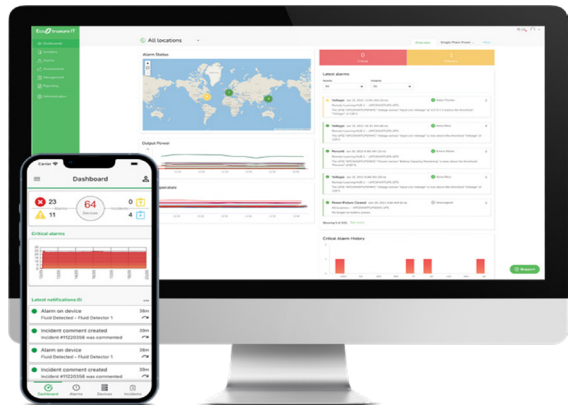
For more information [CLICK HERE. www.panduit.com](https://www.panduit.com)

Schneider Electric

Schneider Electric has model based, automated sustainability reporting features within its EcoStruxure IT data centre infrastructure management (DCIM) software.

Available to all EcoStruxure IT users, the enhanced reporting features combine 20 years of sustainability, regulatory, data centre and software development expertise with advanced machine learning. Customers have access to a set of reporting capabilities, which traditionally required a deep understanding of manual data calculation methods.

Customers now have a fast, intuitive and simple to use reporting engine to help meet regulatory requirements including the European Energy Efficiency Directive (EED). With the download function,



organisations can quickly quantify and report at the click of a button – making it faster and easier to harness the power of data to reduce the environmental impact of their data centres.

[CLICK HERE](https://www.se.com) to find out more.
www.se.com

A design for life

As organisations of all shapes and sizes do their bit to drive improvements in sustainability, Rob Kelly of Sudlows explains why modern network infrastructures are an integral part of the story

▶ While sustainability was once considered 'nice to have', it is now, more than ever, considered critical in modern computer networks. Whether you're operating a hyperscale data centre, an enterprise campus location or a geographically dispersed multi-site network, sustainability is likely one of the top considerations facing you and your fellow stakeholders.

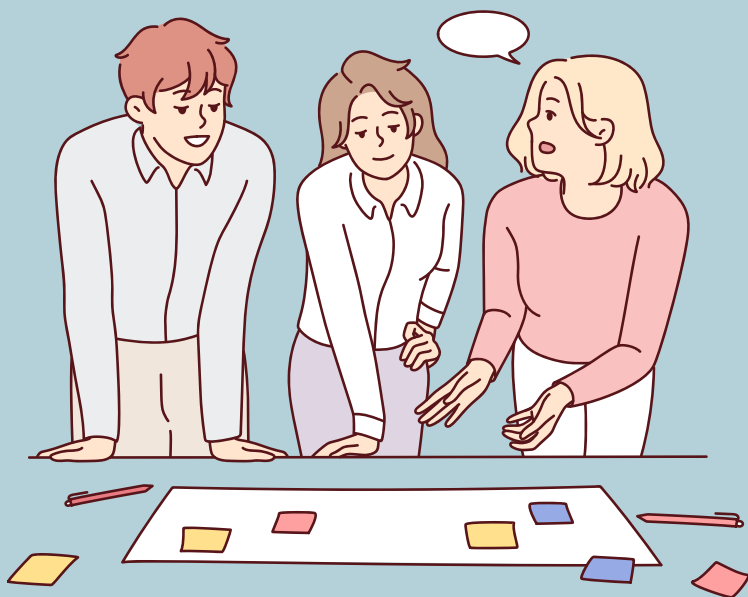
DRIVING FORCES

Several drivers are converging to apply pressure to businesses to accelerate their adoption of sustainable network deployment practices. Firstly, we are seeing an increase in the focus on sustainability in the regulatory domain, as well as various

green and intelligent building accreditation schemes that are driving demands in the procurement process.

The need to adhere to carbon reporting requirements and increased due diligence on suppliers in matters of sustainability and corporate responsibility are now commonplace. In some examples, as much as 25 per cent of available marks under a tender format have been attributed to matters of sustainability and corporate social responsibility.

Secondly, but by no means a new phenomenon, we are continuing to see increased cost pressures in organisations, and the drive to cut operational expenditure can often be top of mind for many business leaders. Designing a network



which is both sustainable in nature and lower in operating costs by way of reduced power and cooling needs is an excellent start.

FLOW CHART

The modern network is also changing as east-west data flows significantly increase with micro services architectures and artificial intelligence (AI) solutions, as well as the proliferation of edge nodes to reduce latency. Wireless components also continue to evolve with higher power and more capable access points, providing a wireless first network which many organisations are adopting. These trends are seriously pushing network capacity growth and, in turn, power requirements within the network, so care must be taken to ensure that capacity growth does not just equal energy growth.

Finally, a growing number of organisations are documenting and working towards specific emissions reduction targets, where those emissions are a result of their business activity. The provision, installation and ongoing operation of a network may touch on all three emissions groups, but particularly Scope 2 – indirect emissions (purchased energy) in relation to the ongoing energy requirements to operate the network, and Scope 3 – indirect emissions (supply chain and lifecycle). This is in relation to supply chain energy emissions both inbound, in procurement and delivery of the equipment, and also outbound, in terms of the disposal, recycling or re-use of the requirement once it reaches end of life.

POINTS OF PRINCIPLE

There are some key things to consider when it comes to adhering to sustainable principles:

- **Don't ignore the physical layer.** When faced with the array of possibilities within the active network to enhance the networks' sustainability, it is sometimes easy to ignore the physical layer upon which the network sits.

Employ best practices for designing and deploying your physical layer. These include the correct levels of future proofing in the backbone and a flexible grid style structured approach to the access connectivity to help mitigate future needs for additional cabling. Right size the cabling pathways and equipment locations, ensuring that while there is suitable space for expansion, the solution is not over engineered. This can result in excessive materials being installed or valuable building space being needlessly powered and cooled.

Working with vendors that have their own strong sustainability strategy is important. Many structured cabling system manufacturers are well versed in sustainability and offer plastic free packaging and Environmental Product Declarations (EPDs). It is commonplace for new build projects looking to attain certain sustainable building accreditations to request EPDs for all products installed by an integrator.

- **Continue the right sizing principle.** Right sizing shouldn't only apply to the physical layer – care should be taken to also right size the active network architecture.

It is sometimes too easy to over engineer a network architecture and end-up with surplus port density and network capacity, resulting in significant energy waste. Look at the network's use case, traffic patterns and expected growth over time. Think about different types of network deployments such as wireless

‘Sustainability is not a singular action – it’s embedded throughout the entire lifecycle of a modern network, starting from the initial design.’

first and levels of redundancy in differing applications. Also, consider what energy efficient features might be available for you to utilise, such as Energy Efficient Ethernet (IEEE 802.3az). Correctly selecting and sizing the right network equipment for the task is key to achieving a sustainable design.

• **Wireless first networking.** With most user devices now being portable, along with a generational shift to mobile working practices, the requirement for significant fixed wired access is now significantly reduced.

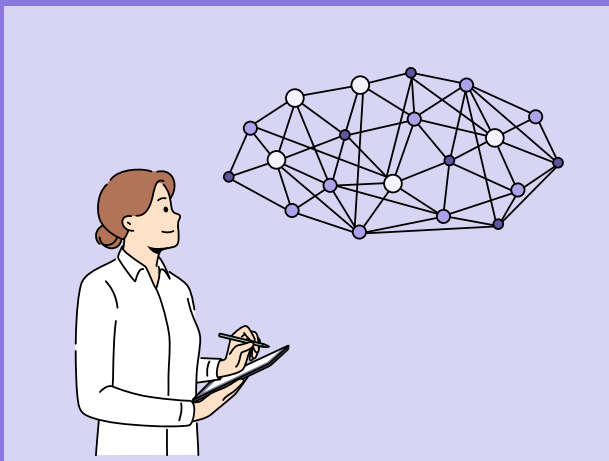
While fixed position devices such as audiovisual (AV) equipment, printers and some intelligent building technologies will still leverage fixed structured cabling, wireless connectivity is now the go to access medium for most users. While this offers a significant reduction in fixed switch ports and the associated rack space, power and cooling etc, modern access points can be power hungry, so suitable care should be taken to properly plan the wireless design, providing suitable capacity and coverage for the building without overengineering the requirement.

Having excess wireless access points in your wireless design is not attractive from either a sustainability or wireless planning point of view. Consideration should be given to which access point models are used, balancing high capacity access points in the areas that

require them with lower powered models in less utilised areas.

• **Leverage software and AI network operations.** Software defined networking (SDN) and AI network operations tool kits are becoming more commonplace as organisations’ operational budgets are being squeezed, yet demands on the network continue to increase. Network operations teams simply need to do more with less and, as well as drastically improving network operations, this tooling can also play heavily into the sustainability story.

The modern cloud, driving intent based



networking, can provide dynamic power management options such as disabling unused access points, rate limiting unused links out of hours or grouping low traffic workloads into fewer active pathways, while still maintaining service level agreements

(SLAs). The ever-improving visibility and access provided by modern cloud managed networks also allows enhanced remote troubleshooting and problem solving, with many vendors now firmly leaning into AI solutions to achieve this.

This essentially makes on-site engineering deployments for troubleshooting an almost legacy practice, apart from high risk changes and hardware failure, of course. This, in turn, supports organisations in pursuit of their emission reduction targets, as fewer physical trips to site has a net positive impact on Scope 1 – direct emissions (company sources).

- **Improved monitoring for easier management.** Keeping with the modern cloud discussion topic, this new generation of network management tools provide enhanced network monitoring and simplified dashboards and reporting. This means monitoring the network not just from a performance or security perspective but also from a sustainability perspective has never been easier.

It's very difficult to manage that which you cannot see. This improved level of visibility supports network operations teams and business leadership in making proactive decisions in matters that affect organisational sustainability goals as they pertain to the network.

THINK BIG

Whatever sustainability goals an organisation has, you can be sure that with any new project there is most likely going to be a significant focus on sustainability. There's also an expectation that the modern network is going to play its part.

Sustainability is not a singular action – it's embedded throughout the entire lifecycle of a modern network, starting

from the initial design. This includes right sizing the design, streamlining installation and delivery by consolidating shipments, minimising plastic packaging and reducing set-up time through zero touch provisioning. It also extends into ongoing operations, with practices such as enabling remote triage and troubleshooting, and leveraging dynamic power management tools.

REASONS TO BE CHEERFUL

There are many reasons why the focus on sustainability continues to grow. However, when you strip back the regulation and organisational goals at the core of it, providing more sustainable, environmentally friendly solutions is simply the right thing to do. ■



ROB KELLY

Rob Kelly has been in the communications and networking industry for over 20 years, since entering as an apprentice cabling engineer. He now holds the position of smart technology director at Sudlows. During his career Kelly has successfully delivered projects across numerous technology disciplines and in a range of different environments.

Let the circle be unbroken

Jonas Güresir of R&M explains the steps, regulations and challenges associated with integrating circularity into the value chain

▶ A circular approach to sustainability means shifting away from the traditional linear take-make-dispose model. It means designing operations so that resources are used more efficiently, products and materials are kept in circulation for as long as possible, and waste is minimised or eliminated. This means rethinking how products are designed, made, used and recovered.

STRATEGIC DIRECTION

Products designed for circularity are created to last longer, be repaired, upgraded or recycled. Materials are chosen not only for performance but also for their ability to re-enter the value chain. Circular supply chains prioritise recycled or renewable inputs and demand transparency and responsible practices from suppliers.

Ensuring circularity in value chains is becoming increasingly important from an environmental perspective but also from a strategic and economic one. Our industry relies on energy intensive production processes, scarce raw materials and complex global supply chains.

Without a circular approach the sector's environmental footprint will remain on today's level, with waste generated through continuous equipment upgrades and heavy dependence on resources such as copper, plastics and rare metals.

Circular supply chains that recover and reuse materials locally are better equipped to handle global disruptions, price fluctuations and regulatory tightening.

POINT OF PRINCIPLE

By embedding circularity principles manufacturers can extend product lifetimes and reduce waste, while lowering dependence on mining and supporting net-zero targets, which increasingly include Scope 3 emissions in their value chain calculations. High quality standards should ensure products are exceptionally durable and robust, extending their lifecycle. This longevity directly supports circular economy principles by reducing the need for frequent replacements and minimising



waste. However, implementing such approaches throughout the supply chain can be challenging for cabling and network equipment manufacturers.

Materials and processes are resource and energy intensive. Manufacturing processes are often carbon intensive and not all facilities have shifted to renewable sources. Packaging and logistics add strain as reels, plastics and cardboard generate waste and emissions. Reuse and recycling concepts are not yet widely implemented and products are often made of mixed materials that are hard to separate and recycle cost effectively.

Cabling and equipment rely on a global network of raw material suppliers, component manufacturers and assemblers – often in regions with varying environmental and labour standards. This makes it hard to trace inputs, verify compliance or enforce accountability. These factors make circularity and low carbon production challenging even though the pressure to transition is growing.

A successful transformation depends on embedding sustainability principles consistently across all stages of business operations. This requires a holistic approach that encompasses product design, supply chain collaboration, regulatory compliance and continuous improvement.

PRODUCT DESIGN

The first step is to consider circularity at the very earliest stages of product development. This includes minimising the use of virgin materials, designing for durability and enabling recycling or reuse at the end of a product's lifecycle.

Optimising packaging is vital and by reducing material use, shifting to bio-based and recycled materials and designing for recyclability, businesses can significantly lower their environmental footprint. One possible approach is using bio-based packaging materials and implementing recyclable cardboard solutions across production plants. Adhesive labels can be replaced by inline printing to further reduce waste. A realistic target for many organisations is to increase the recycled or bio-based materials in their packaging within the next few years. In my opinion, recycled or bio-based materials should constitute a share of 50 per cent of all packaging materials by 2030.

WASTE REDUCTION

Waste management plays a pivotal role in circularity. Companies must continuously redefine waste categories, increase recycling rates and reintegrate materials back into the production cycle. For instance, waste audits might reveal that metals, plastics and cardboard form the bulk of recyclables, while residual waste still accounts for a smaller but significant



‘Ensuring circularity in value chains is becoming increasingly important from an environmental perspective but also from a strategic and economic one. Our industry relies on energy intensive production processes, scarce raw materials and complex global supply chains.’



It is essential to make sure suppliers confirm adherence to a code of conduct, which addresses these ethical and environmental principles. Ideally, suppliers should sign confirmation of compliance and maintain whistleblower

share. The focus moving forward is on increasing the proportion of recycled and reused materials, while minimising landfill contributions.

New approaches such as custom assembled packaging (CAPAs) offer promising solutions. By allowing customers to order only the components they need, waste and emissions can be reduced by up to 25 per cent. Such innovations exemplify how business models can adapt to support circularity.

STRENGTHENING COLLABORATION

Circular value creation requires close collaboration with suppliers and partners. This means aligning business relationships with shared sustainability goals. Companies need to define and enforce requirements, such as compliance with human rights, prohibition of child labour and adherence to environmental standards.

procedures to ensure accountability and transparency throughout the chain.

Integrating circularity also means complying with international regulations and certifications. Suppliers must provide evidence of standards such as ISO 9001 for quality management, ISO 14001 for environmental management, ISO 45001 for occupational health and safety, ISO 27001 for information security, REACH for chemicals regulation and RoHS for hazardous substances. These requirements ensure that the value chain operates safely and responsibly, while also meeting customer and legal expectations.

CONTINUOUS IMPROVEMENT

To make circularity sustainable in the long-term, companies need to implement systematic improvement programs. Continuous improvement programs (CIPs)

are a proven tool to ensure that suppliers without ISO certification initiate corrective measures and quality improvements.

Risk management is another critical step. Companies must evaluate environmental, social and governance (ESG) risks at every stage of the value chain. This includes analysing the potential impact of resource scarcity, regulatory changes and supply chain disruptions. Transparent communication with partners and active risk monitoring are essential to maintaining progress toward circularity goals.

POTENTIAL ISSUES

While the benefits of circularity are clear, companies face significant challenges. Recycled materials may not always meet performance requirements such as durability or moisture resistance. Customers must also gain confidence in new materials.

Bio-based and recycled inputs can also be more expensive, especially during early adoption, while ensuring consistent standards across a global supply chain requires coordination and monitoring. Furthermore, developing new processes, such as modular packaging or recyclable components, demands investment and time.

A WELL ROUNDED APPROACH

Integrating circularity into the value chain is a complex, rewarding and, ultimately, necessary process. By embedding circularity into product design, strengthening supplier collaboration, ensuring compliance with international standards and innovating in waste management, companies can reduce their environmental footprint while enhancing long-term resilience. There are some real challenges to overcome, ranging from cost

to quality control, but with well-defined processes, strong regulatory frameworks, continuous improvement and transparent supplier engagement, a fully circular value chain is within reach. ■



JONAS GÜRESİR

Jonas Güresir began his journey at R&M in 2013 as a production process engineer in the development department. After serving as head of quality management and head of global production engineering and operations support, he assumed responsibility as the head of production, leading the production unit in Switzerland. In April 2025, he was appointed chief operating officer and executive board member and in August 2025 he took on the additional role of sustainability officer, furthering his commitment to advancing R&M's environmental strategy.

Fluid dynamics

Welcome once more to Knowledge Bank, where tech is demystified.

Carrie Goetz tackles the question – what is liquid cooling and why use it?

▶ Liquids and computers mixing? It goes against everything we ever learned about electronic devices but in data centres we embrace liquids. With high performance computing, artificial intelligence (AI) and high density environments, hotter data centres are the result due to the type of processors, the volume of processing and the power required to perform that processing. But why would we want to put liquids in a data centre? After all, electricity and water are not friends. In a word, efficiency.

BACK TO BASICS

In a traditional data centre air cooling scheme, air is pulled into the front of the equipment by intake fans inside the server, switch, storage device, etc. As the air moves across the heat generating chips inside, the air picks up the heat. The now warmer air is pushed out of the back of the equipment by rear exhaust fans. This heat is now in the hot aisle (rear of the cabinet).

The heated air from the hot aisle is then picked up by computer room air conditioners (CRACs) or computer room air handlers (CRAHs), where it is directed to external equipment. On the outside, the air is rejected again by cooling towers, condensers and the like. Mother Nature handles the rest. In waste reuse projects, the heat generated is used to power

systems that utilise it such as homes, businesses, greenhouses and swimming pools.

MASTERING THE ART

While all of this sounds straightforward, the engineering required to make this as efficient as possible is an ever-changing bit of artistic mastery. Still, it isn't exactly rocket science either.

For heat rejection to work, the unit rejecting the heat must be sized correctly and there is a fixed equation for finding out the amount of heat rejection required.



To do so, we must first understand the relationship between power and cooling.

1W of power generates 3.412 British thermal units (BTUs) per hour. Add up the power consumption for all equipment, multiply it by 3.412, and the result is the amount of heat rejection (cooling) required in BTUs.

Higher density environments refer to facilities with a higher concentration of power per cabinet. For perspective, lower density data centres may have 5-10kW of power draw per cabinet. In contrast, generative AI equipment draws 120-140kW per cabinet. Furthermore, not all heat rejection equipment is created equal. So, beyond determining how much heat we need to reject, we also need to investigate

the efficiency of the equipment used for that rejection. This rating is the Energy Efficiency Ratio (EER). The higher the EER, the more efficient the unit. The most efficient systems today are liquid based.

BEST EFFECT

Liquid cooled systems work by transferring heat to the liquid for rejection. The amount of heat they can reject depends on the liquid, flow rate, temperature, external equipment and efficiencies.

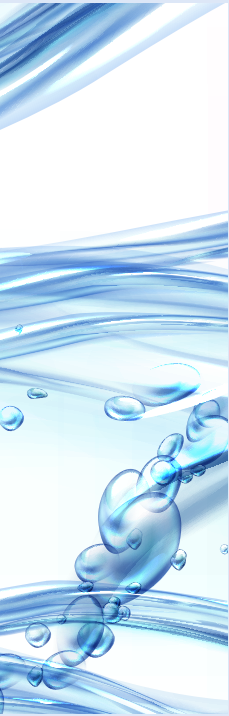
Cooling distribution units (CDUs) are responsible for circulating the fluids around

the data centre on internal loops. As the fluid moves in or around the cabinet, the fluid attracts the generated heat. The heated liquid then moves to the CDU. The CDU heat plates accept the heat transfer from the fluid for handoff processing to the outside fluid loop. The resulting cooled interior loop liquid circulates for another heat attracting trip. The transfer plates move heat to the fluid in the exterior loop, which is then transferred to the exterior heat rejection equipment.

There are various types of liquid cooling. Direct to chip comprises a manifold system that pumps coolant through heat attracting plates connected to the processing chip(s), replacing the traditionally attached heat sink fans. Rear door heat exchangers (RDHX) work similarly to an automobile radiator. The heated air blows out of the rear of the cabinet across the door's coils. Fluid flows through the door coils, attracting heat before it hits the hot aisle. One other form of closely coupled liquid cooling is immersion cooling. In this scenario, the server cabinets are horizontally situated and filled with fluid.

HORSES FOR COURSES

Some facilities will operate entirely with liquid cooling. Some will cool with a combination of air and liquid. Some, although more expensive, will use air only. Further down the pike, who knows? But suffice it to say, there is no one size fits all. ■



Closing the loop

With a career spanning many different areas of technology, **Simon Taylor** is now at the forefront in revolutionising the way precious metals are redistributed to the circular economy. **Rob Shepherd** spoke to him about his life and career, and why data centre operators need to be environmentally accountable

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

ST: These days, I am both an investor and business leader focused on tech innovation and industrialisation processes. I am a principal investor and co-founder of Bioscope Technologies and serve as the executive group chairman of Bioscope and its sister company n2s, in which I have a 75 per cent shareholding with my longtime business partner, Nick Razey. Together, we have made it a champion of sustainable technology lifecycle and recycling best practices and services.

n2s has pioneered bioleaching – applying naturally occurring bacteria to recover strategic metals such as copper and gold from printed circuit boards (PCBs). To bring this to market effectively we set-up Bioscope to accelerate the research

and development to encompass many more metals and rare earths such as silver, tin and palladium. This is very exciting and our patented processes are a potential game changer and world beater.

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

ST: My career has always been in the tech sector. After leaving university in the early 1990s I joined Toshiba Information Systems and then Cable & Wireless. After that, I was a co-founder of Interoute, which was recently sold for €2.3bn. In 2008, Nick

Razey and I founded Next Generation Data (NGD), which we grew to become the largest data centre campus in Europe before selling our business to Vantage Data Centers around five years ago for \$800m.

Nick and I saw a massive emerging market opportunity for large out of town facilities that could offer space and power at half the cost of the typical locations in and around London, along with greater physical security following the 9/11 and 7/7 terrorist attacks. The economies of



scale a mega data centre like NGD could offer, with abundant power and security, all added up to a compelling proposition. I think looking back, and also forward to the future, we have been proved right.

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

ST: Most enterprise data centre owners and colocation operators are aware of the necessity to optimise energy usage and implement carbon emission savings strategies. Leading operators now offer customers 100 per cent renewably sourced energy options and are leveraging more intelligent water and energy saving cooling solutions. A few are evaluating new types of fuel sources.

Direct connection to solar and wind energy via on-site battery storage and the emergence of district heat reuse are further welcome initiatives. Adherence to sustainable practices for building construction, operation and maintenance is also increasingly common.

But we cannot afford to slacken off the pace of innovation, as there's still much to do. Meeting Scope 1 and Scope 2 is largely within the control of the enterprise organisation or a data centre operator in terms of direct and indirect emissions produced from energy owned or purchased, but a sustainable digital infrastructure, as in Scope 3 emissions reporting, calls for accountability across the entire supply/value chain. After all, the

'It's time for the data centre industry to start recognising the immense value of secondary material sources. These materials have already been mined. The opportunity lies not in extracting more, but in recovering and reusing what we already have.'

pre-use product lifecycle phase (product manufacturing to final delivery) accounts for 70-90 per cent of total hardware equipment embodied carbon.

This demands a significant shift when it comes to IT and network equipment lifecycles from servers, routers, switchgear, storage devices, PCs, laptops, smartphones and cabling. This is a major challenge.

While owners of on-premises data centres may have direct control over purchasing of assets compared to third-party operators whose customers and/or lease finance providers are responsible for sourcing the kit, all data centres are heavily impacted by the sustainability policies and actions of the technology hardware manufacturers and those of their suppliers, distributors, systems integrators and resellers. These are all part of the supply/value chain and need to be more accountable.

RS: What environmental information should technology suppliers make readily available to enable sustainable choices to be made?

ST: Underpinning any circular IT solution must be the ability to accurately measure and audit the entire Scope 3 CO₂e lifecycle for IT at the asset level. However, until

‘The underlying issue so far is there’s little or no incentive – financial or legislative – for manufacturers or their customers to facilitate asset reuse or recycling.’

recently there has not been a data lake available that joins product carbon emission lifecycles together – prior to, during and post-use – to enable organisations to form a net-zero position.

This is changing with the emergence of granular reporting tools that provide a full understanding of the environmental position. These will enable data centres to drive decisions that support their own sustainability reduction targets as well as help inform those of their customers from equipment procurement to retention and at the disposal stage.

RS: Are manufacturers of network infrastructure products and systems doing enough to help data centre operators accurately assess and report their Scope 3 greenhouse gas emissions?

ST: Many manufacturers are still lacking when it comes to offering modular upgrades of equipment, leading to a rip and replace culture for hardware assets such as servers, PCs, laptops, network kit and cabling every 3-5 years. The underlying issue so far is there’s little or no incentive – financial or legislative – for manufacturers or their customers to facilitate asset reuse or recycling. Therefore, they remain vested in selling ‘net new’ rather than conserving or extending the life of existing hardware equipment.

Such wastage is amplified by a prevailing strategy to minimise the cost associated with IT disposal rather than find ways of maximising reclamation of components and precious metals. These, increasingly, are in

finite supply or the subject of geopolitical friction.

Putting this into context, the United Nations (UN) has stated that from the 62 million tonnes (Mt) of electronic waste (e-waste) produced globally in 2022 (up 82 per cent from 2010 and on track to rise to 82 million tonnes in 2030), less than one quarter was documented as having been properly collected and recycled, leaving \$62bn worth of recoverable natural resources unaccounted for and increasing pollution risks to communities worldwide.

Recycling one tonne of PCB boards can contain 40-800 times more gold – and 30-40 times more copper – than can be mined from one tonne of ore. But that’s just the tip of the iceberg, a single PCB can contain as many as 60 metals!

Adding to the growing mountain of e-waste is the conventional approach to disposal of data which all too often results in the destruction of serviceable hard drives. There are proven, secure and compliant software solutions available for wiping old data rather than wholesale hardware destruction.

RS: Should data centre owners and managers take more responsibility when it comes to ethically disposing of network infrastructure equipment that is no longer required and potentially harmful to the environment?

ST: Yes, because any data centre striving to meet its own decarbonisation goals and obligations cannot do so singlehandedly – it is largely beholden to the supply chain

stakeholders upstream. At the same time their customers/users tend to accept ever shortening usage periods as the norm. Often, they overlook the benefits of achieving greater product longevity and optimal cost of ownership through the implementation of product maintenance, refurbishment and reuse programmes.

This is where the data centre, as a focal point for the enablement of enterprise IT, colocation, cloud computing and carrier connectivity, is ideally placed to take a much more active role in decarbonising themselves and the wider tech industry. They can lobby manufacturers and educate users and customers about the necessity and benefits of changing conventional linear practices in favour of circular IT lifecycle management and recycling solutions. Such an approach will not only help decarbonise data centres but the entire tech industry supply chain and help conserve precious materials.

RS: What can be done to encourage greater recycling and/or reuse of end of life products?

ST: We need tougher carrot and stick legislation such as penalties, or conversely, tax incentives when it comes to ethical and sustainable disposal of equipment. This is especially relevant where repatriating/repatriating vital materials such as PCB precious metals and rare earths is concerned. Furthermore, extended producer responsibilities need prioritising and strengthening with enforced schemes to drive product designs that support disassembly and recyclability, ensuring more materials are recovered and reintegrated into the supply chain.

We also need secure supply chains through domestic recovery. Recognising recovered metals as strategic assets and embedding domestic recovery efforts into

the UK's critical minerals strategy would ultimately drive more attention and be a reason to develop innovation clusters, where small to medium sized enterprises (SMEs), researchers and manufacturers can colocate, collaborate and accelerate the commercialisation of recovery technologies.

Last but not least, we need a more open and transparent market for access to the secondary materials with clear standards and procurement incentives that prioritise recovered over virgin materials – particularly in public sector projects like defence, infrastructure and renewable energy.

RS: It's that crystal ball moment – how do you see the world of sustainable IT asset management and circular economy developing over the next few years and what would you like to see happen?

ST: It's time for the data centre industry to start recognising the immense value of secondary material sources. These materials have already been mined. The opportunity lies not in extracting more, but in recovering and reusing what we already have.

More manufacturers, data centres and users need to engage the services of ethical technology lifecycle and licensed IT asset disposal (ITAD) providers. This will help extend typical 3-5 year IT asset lifetimes by as much as another five years, while allowing the majority of materials recovered from end of life products to be returned into the manufacturing supply stream. The technology exists. What we need now is a policy environment that accelerates clean technology and stops holding the industry back with legacy thinking. A circular economy is not just an environmental imperative – it is an economic and strategic one. ■

Quickclicks

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Strategic Design In The Age Of AI: Insights From 250 Data Centre Leaders is a report from **Onnec** that offers insight into how AI demand is transforming infrastructure strategies.

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LSBUD's annual Digging Up Britain report, which analyses the digging activity across the nation, revealed that the telecoms industry performed more than 1.4 million underground asset searches – the biggest contribution to the UK's safe digging industry.

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Uptime Institute has published the results of its Global Data Center Survey 2025.

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From Complexity To Clarity: Modernising Cloud And IT For What Comes Next is a report from **Unisys** exploring tech companies' infrastructural readiness to deploy and scale emerging technologies.

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North America Data Center Trends H1 2025 is a briefing document from **CBRE**.

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How AI Is Driving Ultra-High Fiber Count (UHFC) Cable Adoption In Data Center White Space is a blog by **AFL**.

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NTT Data and **Cisco** have co-sponsored an IDC InfoBrief that shares strategic guidance for organisations seeking to accelerate transformation by modernising their network infrastructure.

CLICK HERE to download a copy of Wired For Intelligence: A CIO Guide To Enterprise Networking For AI.



Go with the flow

With data centre capacity moving to the edge, [Stuart Crump](#) of LiquidStack looks at how liquid cooling will shape-up

▶ When the UK government told citizens in August that they could help the country through a drought by deleting old online photos or emails to ease pressure on data centres, many observers were bemused. Would deleting cat snaps really make a difference? Static data storage is far less resource intensive than live enterprise workloads or training the next generation of large language models (LLMs). Others argued it was unfair to ask consumers to cover for the shortcomings of big tech or utilities.

ATTENTION SEEKING

Yet the advice highlighted that water consumption is a real issue for data centres and that governments are paying closer attention, demanding stronger action as capacity scales. This becomes even more complex as data centre capacity increasingly moves to the edge.

The wave of mega data centres built in recent years has been essential for training the LLMs that power today's artificial intelligence (AI) revolution. But enterprises are now eager to put those models to work. This shift from training, which is a batch process, to inference, which is real-time and continuous, is pushing the centre of (data) gravity toward the edge.

Latency becomes critical when chatbots answer customer queries, recommendation engines decide credit approvals or internet of things (IoT) and smart manufacturing

systems operate in real-time. In these cases, processing must happen as close to the user as possible. A smart city is essentially one vast edge installation. IDC forecasts that edge computing spend will reach \$261bn this year and \$380bn by 2028, driven heavily by AI-accelerated processors. Intellect, meanwhile, estimates the edge data centre market at \$13.83bn in 2024, growing at 24 per cent compound annual growth rate (CAGR) to \$41.83bn by 2030.

HORSES FOR COURSES

The edge is not a single, uniform environment. A containerised data centre at a remote telecoms site faces very different challenges from one supporting financial services in a city centre or imaging in a hospital. Still, some common themes emerge. AI workloads mean more compute per rack, with Nvidia's roadmap pointing to graphics processing units (GPUs) that, while more efficient, will still draw enormous power.

The 1MW rack is fast approaching, and with it comes more heat. Unlike hyperscale builds on greenfield sites, edge deployments will often repurpose existing computer rooms, university labs or mixed use urban spaces. Power access may be limited, neighbours may object to noise from traditional cooling and remote sites may be harsh and difficult to maintain. At the same time, governments, regulators



and communities will pay ever closer attention to emissions, power use and water consumption.

GLOBAL FOCUS

Around the world, policymakers are sharpening their focus on data centre sustainability. Amsterdam imposed restrictions on new data centre builds until operators could demonstrate that cooling and energy use would not strain local infrastructure.

Several US states are now requiring facilities to report and reduce water withdrawals. And in Asia, cities such as Singapore and Hong Kong are incentivising designs that integrate waste heat reuse or alternative energy sources.

Each of these initiatives reflects a common reality. As data centres expand, cooling is no longer just an engineering concern but a matter of public policy.

RESPONSE MECHANISM

Recent analysis by techUK, published in collaboration with the Environment Agency, offers a revealing snapshot of how UK data centres are already adapting their cooling strategies. The report found that 64 per cent of commercial sites consume less than 10,000 cubic metres of water per year – roughly equivalent to a leisure centre – while only four per cent use more than 100,000 cubic metres.

More than half of operators surveyed now rely on waterless cooling systems,

‘Liquid cooling’s role is more than just keeping processors from overheating. It is the enabler that allows the edge to expand responsibly, dense enough to support AI workloads, efficient enough to meet sustainability goals and flexible enough to fit into the wide variety of environments.’

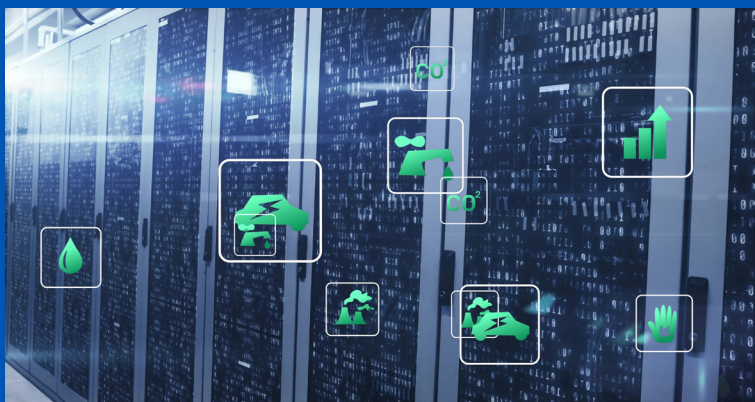
and nearly 90 per cent either measure their water use or operate systems that do not require water for cooling. This reflects a shift toward advanced liquid cooling technologies that reduce or recycle water use, underlining that liquid cooling remains essential for managing dense, high performance workloads while still meeting sustainability goals.

operators are exploring edge clusters to deliver ultra-low latency for immersive applications like augmented reality (AR) and virtual reality (VR). Each of these deployments demonstrates why edge infrastructure needs both density and efficiency, delivering compute horsepower in compact, often unconventional spaces where traditional cooling would struggle.

PUT INTO PRACTICE

At the same time, the edge is becoming a proving ground for some of the most exciting AI use cases. Autonomous vehicle hubs are emerging as edge nodes, processing terabytes of sensor data locally to steer vehicles in real time without relying on distant cloud connections. Hospitals are deploying AI-assisted imaging systems that run diagnostics on-site, cutting turnaround times for patient care.

At the same time, smart factories are layering computer vision and predictive analytics directly into their production lines, while telecom



Liquid cooling is the enabler that makes these use cases feasible at scale.

PROOF POSITIVE

There is also a resilience dimension. Edge sites deployed in harsh or remote environments – from desert telecom stations to offshore wind farm substations – face extreme temperature swings and limited access for maintenance. Liquid cooling offers stable, predictable performance in these conditions, reducing reliance on bulky air systems and enabling compact deployments where reliability is paramount. For operators, this resilience is just as important as efficiency, ensuring uptime in environments where downtime is not an option.

This is where liquid cooling proves its value. No longer a ‘nice idea but’ technology, it is now a proven, mainstream solution. It removes heat more efficiently than air cooling while reducing overall power draw and water use. One study showed energy savings of 42.7 per cent and a Power Usage Effectiveness (PUE) reduction to 1.26 using cold plate technology.

With approaches ranging from immersion systems to rear door heat exchangers to direct to chip cooling, there is flexibility to match the diversity of edge environments, and the potential to drive PUE down even further. Crucially, cooling systems for the edge must be simple to specify and install in non-traditional spaces, scalable enough to handle variable workloads, and manageable even in remote or urban locations where maintenance can be challenging.

MOVING ON UP

The edge will not stand still. As it grows, both data centre operators and liquid

cooling suppliers will need to adapt to new use cases, shifting customer demands and mounting environmental pressures. Liquid cooling’s role is more than just keeping processors from overheating – it is the enabler that allows the edge to expand responsibly, dense enough to support AI workloads, efficient enough to meet sustainability goals and flexible enough to fit into the wide variety of environments. If we fail to adapt, governments may soon be demanding more than just deleting old emails. ■



STUART CRUMP

Stuart Crump is global commercial director at LiquidStack. He is a seasoned executive with a proven track record in driving growth and transformation in the data centre industry. Combining deep technical expertise with strong commercial acumen, Crump has led high performing teams to deliver strategic objectives and consistently exceed expectations. He has championed innovative initiatives such as waste heat recovery schemes to reduce the environmental impact of data centres and advance the industry’s transition to a more sustainable future.

AFL

AFL's DENALI is a modular optical fibre platform specifically engineered for high growth graphics processing unit (GPU) environments with minimal infrastructure upgrades. The DENALI platform delivers leading edge data centre performance today, while positioning the facilities of tomorrow to scale with the increasing complexity and volume of hyperscale and AI workloads.

With its modular design, the DENALI platform adapts as networks grow, featuring advanced rackmount hardware, cassettes and pre-terminated customisable



assemblies. This platform delivers up to 288 LC duplex ports (576-fibres) in 4RU of rack space and supports speeds from 10Gb/s to 800Gb/s and beyond.

The platform's design reduces the number of components required for installation, streamlining inventory management and reducing potential points of failure. DENALI also ensures seamless integration with existing infrastructure, minimising disruption during upgrades and expansions, while cable management solutions reduce maintenance requirements and improve long-term network reliability.

To find out more [CLICK HERE.](https://www.aflglobal.com)
www.aflglobal.com

Pulsant

Dan Blackwell looks at the crucial role of edge in delivering smart cities.

Smart cities, once a vision of the future, are fast becoming a reality. At the heart of this transformation are IoT devices and AI-driven applications to enable services. However, their success depends on having the right technology foundation to enable fast, reliable data processing and transmission.

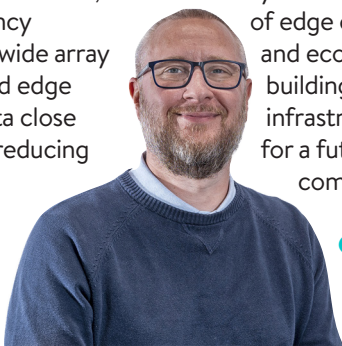
That's where edge computing and 5G come in. 5G enables ultra-fast, high bandwidth, low latency communication across a wide array of smart city systems, and edge computing processes data close to where it's generated, reducing reliance on distant data centres and alleviating bandwidth constraints.

Together, they

enable the real time performance that modern technologies such as video analytics, AI-powered applications, virtual and augmented reality (VR/AR) experiences, and autonomous systems demand. Edge allows for local capture and analysis, reducing delay and supporting responsiveness in systems that can't afford lag, reducing the risk of network outages to enable emergency services, for example.

The full potential of smart cities will only be realised through the intersection of edge computing, 5G networks and ecosystem collaboration. By building resilient, low latency, scalable infrastructure today, we lay the path for a future of digitally connected communities.

To find out more about Pulsant [CLICK HERE.](https://www.pulsant.com)
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Panduit

Panduit's UPS range offers highly versatile and customer focused 1/2/3kVA lithium-ion and 5/6/10kVA and 10/15/20kVA valve regulated lead acid (VRLA) solutions, available in single-phase and three-phase configurations.

Power interruptions happen and being prepared can be the difference between business continuity and downtime. The right UPS ensures successful operational continuity, however, the time between utility power failure and the IT load transitioning to the UPS is critical. A power interruption longer than 20ms will probably result in an IT systems crash.

Panduit's UPS range provides intelligent network management, environmental and security sensors and the ability to connect to additional external battery packs to scale the failsafe capability. UPS solutions

must be suitable for the IT load they are supporting and primary concerns are the IT equipment running critical loads. For higher speed processors generating more heat at the server, UPS for cooling systems is fast becoming critical.

Compared to VRLA, lithium-ion batteries offer longer lifecycles, reduced weight, a compact footprint and lower cooling requirements. Lithium-ion's potential is also key in small data centres and edge environments.

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Living in a box

Eaton's **Juan Colina** looks at why modular data centres are the key to ensuring business agility in the age of artificial intelligence (AI)

▶ Data is now a core commodity for all businesses seeking growth. According to the McKinsey Global Institute, AI could generate \$2.6tn-\$4.4tn in global corporate profits annually by raising productivity, supporting customer interactions, generating creative content and drafting software code.

GROWING CONCERN

It is therefore no surprise that the UK government has set out its ambition to make the country an AI superpower in its quest for growth. Data centre operators will be central to achieving that ambition, however, they must act fast – growing AI demand put upon data centre providers is already at a rate that outweighs their supply.

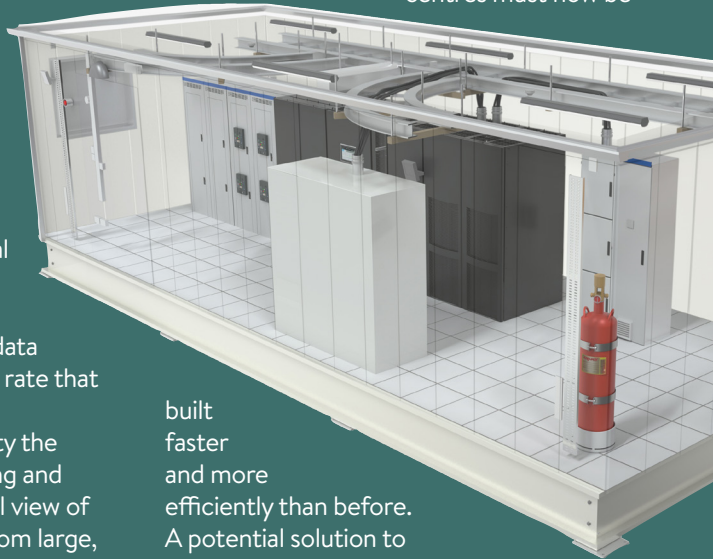
Delivering the power capacity the UK needs will require innovating and evolving beyond the traditional view of data centres. Namely, going from large, static infrastructure projects into agile developments that meet the evolving needs of both customers and operators. By doing so, they will be able to strategically

place facilities in areas where they can serve the highest number of new customers and unlock growth for the greatest number of businesses.

SPEED AND EFFICIENCY

To keep up with surging demand data centres must now be

built faster and more efficiently than before. A potential solution to this is prefabricated or modular construction, whereby components are constructed off-site, in a controlled factory environment.



‘The modular data centre approach offers a strategic advantage in addressing the growing skills shortage affecting cloud computing and AI technicians. By leveraging standardised equipment designs, it minimises the need for specialised teams at every deployment site.’



By maintaining the manufacturing process in this environment, production is much faster and efficient.

Through readymade units, parts can be transported to site and installed quickly, allowing businesses to rapidly gain access to data. Compared to the traditional construction of data centres, often done on-site, prefabrication helps to avoid delays. This is especially important given the significant costs which can arise from construction delays.

SKILL SET

The modular data centre approach offers a strategic advantage in addressing the growing skills shortage affecting cloud computing and AI technicians. By leveraging standardised equipment designs, it minimises the need for specialised teams at every deployment site. This streamlined

set-up enables organisations to allocate expert talent more efficiently – directing highly skilled technicians to the locations where their expertise delivers the greatest value.

Modular designs also support long-term flexibility. Standardisation allows for the easy replacement of modules that are worn down or faulty after years of service, and supports expansion done in stages. This approach allows data centres to be upgraded with new technology or adapted to changing business needs. It offers a more scalable and consistent model, which is becoming essential as organisations race to support new workloads.

A GOOD GRID CITIZEN

As is well documented, data centres have significant energy demands. We cannot avoid discussing data centres without addressing this significant challenge we



must overcome. There is much work needed for energy grids to accommodate the large influx of data centres.

In fact, data centres have the potential to support the grid by providing balance, particularly at peak times. While this capability can be enhanced by on-site renewable energy generation, other key components like uninterruptible power supply (UPS) systems, especially when integrated with battery energy storage systems and intelligent energy management platforms, can enable data centres to act as distributed energy resources.

These systems allow data centres to absorb or inject power into the grid on demand, helping to stabilise frequency and voltage without compromising their primary back-up function. By leveraging

this flexibility, data centres can store energy during low demand periods and discharge it when national demand is high – turning what was once a passive operational cost into a productive, revenue generating asset.

BOOM TIMES

Alongside energy, sustainability is another issue that data centres must address. While we face the challenge of climate change head-on, standards and policies are becoming increasingly more stringent across the globe. To avoid falling short of compliance, businesses must ensure they are driving forward their energy transition. Flexible energy management and utilising energy storage helps businesses to fully harness the intermittency of renewable energy, while aiding their path to net-zero,



reducing their carbon footprint and improving sustainability metrics.

Beyond using renewable energy, modular methods give businesses more control over how components are made. By having one, centralised manufacturing process, businesses improve their ability to track each part's lifecycle and associated emissions. This helps reduce environmental risks, ensuring the selection of greener manufacturing processes and the sourcing of less carbon intensive raw materials. Designs are easily repeated and once a greener process is implemented it can be standard across the business.

Furthermore, with one central location, staff and goods will require less transport and shipping. This lowers their

emissions while simultaneously reducing the business's cost, reducing Scope 3 emissions as a result too.

SUCCESS STORY

As we continue to adjust to the ongoing rise of AI, businesses need to make sure they are not left behind the next technological era. Modularity allows businesses to harness the essentiality of data and ensures they are free to grow and bloom alongside AI.

While this journey will not be without challenges, the advantages of prefabrication allow us to tackle these head-on. The rapid deployment of modularity and the consistency it provides workforces allows us to tackle the fast-paced nature of the sector, while ensuring we do not suffer from the skills gap.

BUILDING BLOCKS

While data centres connect to grids at an increased rate, we must integrate them as good neighbours, not just drawing from the grid but ensuring they have clear objectives to improve the reliability, resilience and decarbonisation of the wider power system. Renewable energy integration will increase the sustainability of data centres, as well as reducing the environmental impact of indirect resources supporting data centre deployment. ■



JUAN COLINA

Juan Colina is data centre and distributed IT segment strategy manager for Eaton's Europe, Middle East and Africa (EMEA) region. Colina has extensive experience in the optical fibre industry, particularly within the service provider and data centre sectors. He has a strong track record in commercial strategy, product management and corporate transactions, with a focus on aligning business objectives with customer needs and market trends.

Pelagos Data Centres unveils ambitious plan for new 250MW facility near the Port of Gibraltar

A major data centre that will deliver up to 250MW of capacity by 2033 is to be built in Gibraltar by Pelagos Data Centres. The state-of-the-art facility is expected to attract investment of approximately £1.8bn and will be constructed in five phases at a 20,000m² site near the Port of Gibraltar. It is the largest current development project in the territory by value and among the largest in its history.

The project represents a transformative step for the territory's digital and economic landscape. It will also make an important contribution to meeting Europe's demand for data centre capacity, positioning

Gibraltar as a significant new node in Europe's digital infrastructure that can serve the broader needs of the UK and continental Europe.



The first stage of the project is scheduled to become operational in late 2027, with subsequent phases to follow at approximately 18-month intervals. The data centre will be powered

independently of Gibraltar's existing power grid and the site will feature a public leisure facility, providing a valuable amenity for the local community.

Portus Data Centers expands its Kirchheim data centre

Portus Data Centers officially kicked off the extensive expansion of its MUC2 data centre in Kirchheim near Munich with a groundbreaking ceremony. At the event, Bavaria's minister of economic affairs, regional development and energy, Hubert Aiwanger, emphasised the importance of high performance digital infrastructure for the competitiveness of the region.

Portus Data Centers is building approximately 2,200m² of additional capacity. The expansion includes 5.5MW of new IT capacity, increasing the site's

total capacity to 7MW. This will make the Kirchheim data centre one of the most

powerful locations in the Munich area.

In parallel with the expansion of MUC2, Portus Data Centers is developing a new facility with up to 12.8MW of IT capacity on a new site within its

highly connected campus in Hamburg. The company has also significantly expanded its Luxembourg data centre with an additional 1.2MW of IT capacity, while further projects in Germany and neighbouring markets are already in the pipeline.

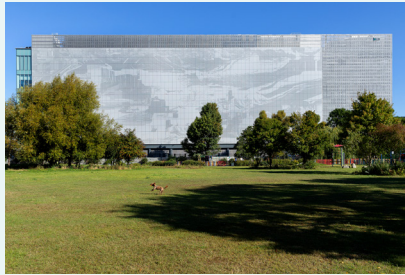


Vantage Data Centers announces opening of second London campus with landmark public art installation

Vantage Data Centers' second London data centre campus (LHR2) opened at the end of September. Located in London's Park Royal district, the 18,000m² facility will deliver 20MW

of IT capacity, representing a £250mn investment into the local economy.

The data centre features one of the largest permanent public art installations in Europe. Spanning a six-story facade, 11 Million Dots pays homage to the industrial



history of Park Royal while celebrating its revitalisation as a new urban destination for both residents and businesses.

Local artist Rafael El Baz collected ambient noise and machinery sounds from area streets and workshops and recorded

more than 120 audio interviews with locals. He then translated his recordings into binary code and audio waveforms and manipulated them to create 11 million perforations that evoke microchips, maps and city landscapes.

PROJECTS & CONTRACTS IN BRIEF

Inspired has signed a tri-party corporate power purchase agreement (CPPA) with Virtus Data Centres and Lynn and Inner Dowsing (LID) windfarms.

Galaxy Data Centers has partnered with Zendo to integrate clean energy into its growing data centre platform. The partnership begins at Redhill Data Centre in London, where Zendo will deliver 40GWh of renewable energy annually.

Freshwave has brought nearly 50 new outdoor small cell sites live for EE in the City of London, expanding coverage and improving 4G and 5G connectivity in one of the globe's leading financial and business hubs.

Thousands of people experiencing financial hardship across Scotland can now access a free smartphone and mobile data to help them get online, thanks to a new partnership between the Citizens Advice Scotland (CAS) network, Virgin Media O2, Hubbub and the Scottish Government. Virgin Media O2 has provided 1,200 refurbished smartphones to Citizens Advice Bureaux (CABs) across 12 local authorities throughout Scotland.

Telehouse Thailand has partnered with National Telecom Public Company (NT) to deliver high capacity international data transmission via submarine cable systems.

Purple has partnered with Newcastle City Council to deliver an extensive city-wide Wi-Fi network. Powered by Purple's ConneX app, the initiative unifies fragmented public Wi-Fi into a single, secure network to make it easier to get online without repeated logins or security risks.

Schneider Electric

Schneider Electric has unveiled its world-leading portfolio of end-to-end liquid cooling solutions for hyperscale, colocation and high density data centre environments.

Available globally, the Motivair by Schneider Electric cooling solutions meet the power and graphics processing unit (GPU) intensive demands of high density data centres reliably, and at scale. The complete liquid and air cooled portfolio comprises data centre physical infrastructure including coolant distribution

units (CDUs), rear door heat exchangers (RDHx), dynamic cold plates, chillers and more, as well as software and services.

These are designed to handle the thermal management requirements of next generation high performance computing (HPC), AI and accelerated computing workloads. The announcement provides the first comprehensive look at Schneider Electric's complete

liquid cooling capabilities since acquiring a controlling interest in Motivair.

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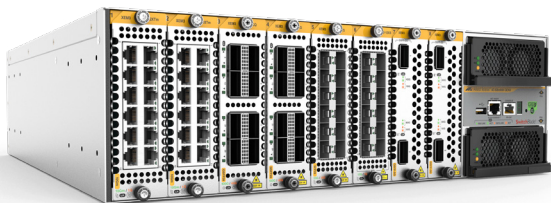
The **SwitchBlade x908 GEN3 (SBx908 GEN3)** from Allied Telesis is a compact 3U modular chassis designed to help enterprises and data centres scale seamlessly to meet modern networking demands. Supporting interfaces from 1Gb/s to 400Gb/s, the SBx908 GEN3 delivers unmatched flexibility, density and performance in a space efficient form factor.

Built for growth, the platform enables capacity on demand – customers start with the ports they need and expand

as requirements evolve. With seamless support for copper, optical fibre, 25Gb/s, 100Gb/s and 400Gb/s, the SBx908 GEN3 ensures smooth migration without costly rip and replace cycles.

Powered by AlliedWare Plus, the SBx908 GEN3 offers unified operations across enterprise and data centre environments. Intelligent automation, resilient stacking and integrated security further simplify management and boost reliability. With up to 12.8Tb/s of switching capacity in just 3U, the SBx908 GEN3 delivers the scalable, high density performance required for AI, the IoT, high performance computing and virtualised workloads.

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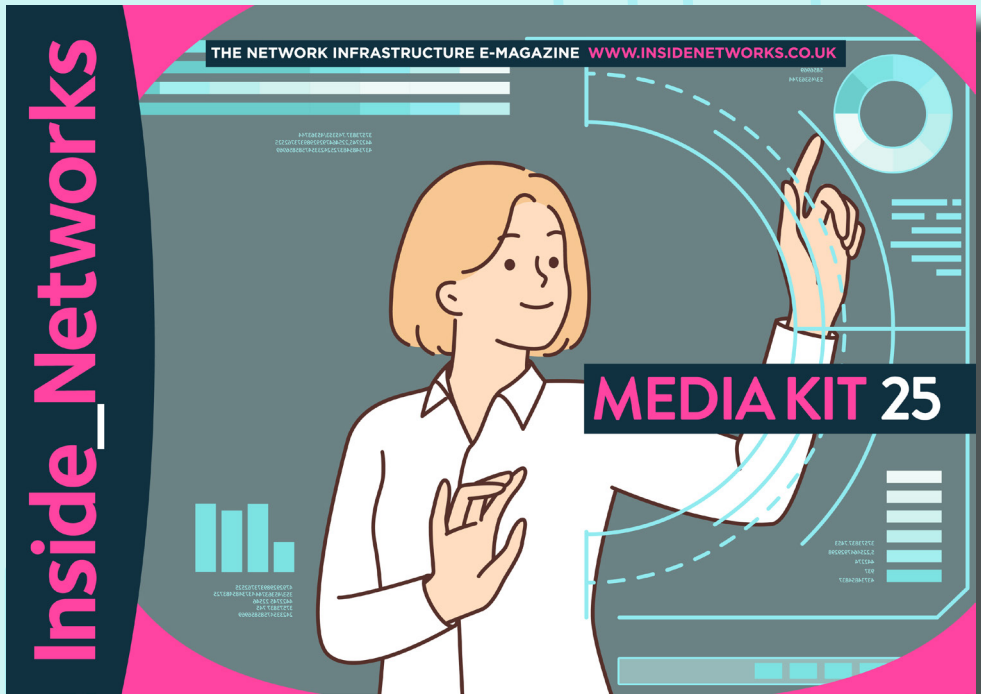
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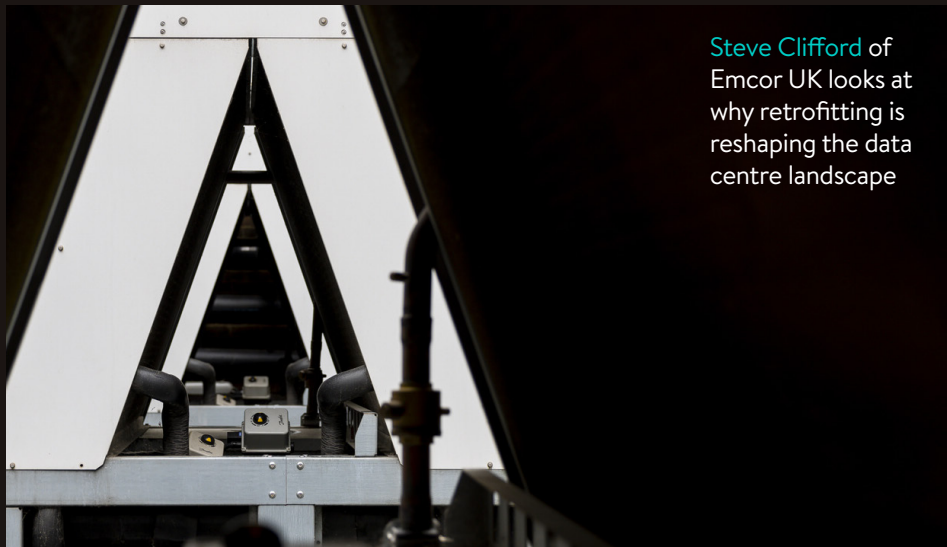
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From stopgap to strategy



Steve Clifford of Emcor UK looks at why retrofitting is reshaping the data centre landscape

▶ The global appetite for data is surging. Fuelled by artificial intelligence (AI), cloud computing and digital transformation, data centre capacity is under relentless pressure. Yet despite hyperscale developments and rising investment, supply is struggling to keep up with demand.

FRONT AND CENTRE

The challenge is structural. In many regions grid availability is limited, land is constrained and planning approvals can take years. As a result, operators are rethinking their approach to growth. One option that was once seen as a tactical compromise is now taking centre stage – retrofit.

Today, retrofit is no longer an emergency fix. It's a strategic lever that

enables operators to meet current and future demands within existing footprints, while reducing carbon and sidestepping the risks and delays associated with new builds. With pressures mounting across cost, carbon and capacity, retrofit is increasingly seen as a proactive, future ready strategy rather than a reactive one.

ON THE RISE

Several factors are fuelling a renewed focus on retrofit:

- **Power availability.** New grid connections can take multiple years and existing sites often offer faster paths to capacity expansion.
- **Cost and speed.** Upgrading an existing facility can cost up to 40 per cent less than a new build and reduce project

timelines by around 30 per cent.

- **Sustainability.** Reusing structures and infrastructure significantly lowers embodied carbon and aligns with tightening environmental, social and governance (ESG) expectations.
- **End of life assets.** Many first generation facilities are facing resilience concerns, ageing plant or insufficient cooling for modern workloads.

LIVE AND DIRECT

Retrofit is complex by nature. This is especially the case in live sites where uptime is non-negotiable. But with the right approach, it can unlock impressive performance gains with minimal disruption.

In one of our recent projects, a data hall was created within a 1,000m² existing facility. Engineers used profile modelling to identify an optimal cooling configuration based on hot aisle containment. A 380V DC power system was installed to maximise energy efficiency, achieving 96.2 per cent across rectifiers and converters. Despite spatial constraints, the design delivered 136 cabinets against a brief of 130. Crucially, the team delivered all works without disrupting business as usual operations, using phased integration testing to enable early deployment of IT systems.

Another retrofit involved converting a redundant call centre into a modern data hall within just 12 weeks. With limited on-site power available, the design included resilient A&B low voltage infrastructure to support 50kW capacity, enabling immediate plug and play deployment. The building

was also future proofed for expansion, while stakeholders were kept informed throughout via a timelapse visualisation of project progress.

These examples underscore that with precision planning and phased execution, retrofit can deliver scale, resilience and speed – even within constrained urban environments.

MAKING SENSE

Retrofitting is not always the right answer. But there are several key trigger points where it merits serious consideration:

- Critical systems approaching end of life
- Increasing maintenance costs or failure rates
- Inadequate power or cooling headroom
- Rising sustainability requirements
- Pressure to scale quickly without access to new grid connections

A detailed lifecycle and resilience assessment is the best place to start.



Operators should audit mechanical and electrical (M&E) assets, assess redundancy levels and explore the energy and carbon impact of retrofit versus rebuild. In many cases, the data makes the case for retrofit.

‘Retrofitting offers the chance to rethink layouts, add overhead power tracks, reinforce floor loads and plan for emerging technologies like liquid cooling or edge compute pods.’

PLANNING WITH PRECISION

Retrofit success hinges on meticulous planning and risk mitigation. It begins with comprehensive surveys and laser scanning to assess structural constraints, followed by 3D modelling and design coordination that ensures systems can be installed without disrupting operations. These models are especially valuable in tight or occupied environments where legacy layouts pose routing challenges.

Equally critical is the risk strategy. This includes designing temporary power and cooling systems that can keep live infrastructure running while permanent systems are upgraded. Many teams now use phased integrated systems testing (IST) and prefabricated component delivery to reduce on-site time and de-risk installation.

Stakeholder alignment is critical. Successful programmes build communication protocols that integrate with IT departments, security leads and business continuity owners – ensuring transparency throughout.

RESILIENCE AND COMPLIANCE

Unlike new builds, retrofits must work within the physical and regulatory boundaries of an existing facility. That means resilience planning becomes even more important.

Power resilience can be enhanced

through modular uninterruptible power supply (UPS) deployments, dual-feed switchroom designs and decentralised back-up power systems. These allow retrofit upgrades to happen in stages, often without taking core systems offline. Cooling systems, meanwhile, must support higher densities and future workloads without compromising redundancy. Hot aisle containment, variable airflow controls and space reconfiguration are all common retrofit strategies.

Compliance and assurance must also be embedded from the outset. Depending on the site’s function, retrofits will need to align with critical national infrastructure (CNI) standards, ISO frameworks and local authority regulations. Older buildings may require firestopping, structural strengthening or system separation to meet today’s compliance thresholds. Retrofitting to modern standards while maintaining operational uptime is both an engineering and project management challenge.

ONE STEP BEYOND

Retrofit’s sustainability value extends far beyond reduced operational energy use. One of its most significant advantages is the avoidance of embodied carbon associated with new materials, groundworks and steel or concrete structures. Even when new plant is installed, reusing existing M&E



infrastructure and integrating with legacy systems can yield substantial environmental savings.

In one recent project, placing the grey space infrastructure away from the data hall avoided unnecessary disruption and material use, while off-site fabrication reduced on-site energy consumption and logistics mileage. Retrofitting also offers a platform to upgrade to higher efficiency systems, such as 380V DC power and smart cooling, which support better Power Usage Effectiveness (PUE) outcomes and long-term energy savings.

When paired with digital tools for energy monitoring and predictive maintenance, retrofit becomes a practical route to not only decarbonisation, but measurable environmental return on investment (ROI).

TOMORROW'S WORLD

Modern retrofit isn't just about bringing facilities up to code – it's about future proofing them for what's coming. AI and high performance computing workloads are pushing rack densities higher, creating new demands for thermal management, airflow and power draw. Retrofitting offers the chance to rethink layouts, add overhead power tracks, reinforce floor loads and plan for emerging technologies like liquid cooling or edge compute pods.

Many operators are also embedding smart systems, from internet of things (IoT) sensors to predictive analytics tools, into their retrofit designs. These platforms provide real-time visibility of energy use, asset performance and environmental conditions, enabling data driven decision making and continuous optimisation.

In effect, retrofit is becoming a gateway to the intelligent data centre – one that's capable of meeting today's needs and agile enough to evolve as those needs change.

STRATEGIC TOOL

Data centre demand isn't slowing but the barriers to new capacity – grid, land, cost and carbon – are real. Retrofit offers a viable and often preferable alternative as it is faster to deploy, more affordable to deliver and more sustainable by design. With the right planning, technical expertise and assurance frameworks, retrofitting enables operators to scale within existing footprints, maintain uptime and prepare for the next wave of digital transformation, all while reducing environmental impact and regulatory risk. In a sector defined by acceleration, retrofit isn't just a stopgap, it's a smarter way forward. ■



STEVE CLIFFORD

Steve Clifford is director of data centres at Emcor UK and has more than 35 years' experience in building services project delivery and facilities management. Clifford specialises in the data centre and telecoms sectors and has a successful track record of delivering multiple large scale complex projects, from inception and design to providing detailed support throughout delivery stages.

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