STRATEGIC DESIGN IN THE AGE OF AI: INSIGHTS FROM 250 DATA CENTRE LEADERS

How tariffs and geopolitical tensions, skills shortages, and siloed design choices threaten the future of AI-ready data centre infrastructure

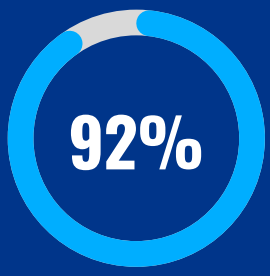
AI has become a defining force in how operators design data centre infrastructure. Rising demand for data centre capacity to support AI applications, models and systems is fuelling an unprecedented surge in infrastructure expansion.

An Onnec study of 250 senior decision makers and data centre operators has found that AI demand is transforming infrastructure strategies – but operators are struggling to keep pace, grappling with skills shortages, geopolitical turbulence and design complexity.

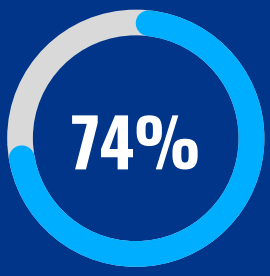
Operators must now rethink how they design data centres and consider every design aspect for new or existing sites. To do so, operators must commit to an era of holistic design, where everything from power and cooling to cabling is considered as one. Failure to do so will see sites being developed that aren't fit for purpose, degrade over time, and fall short of customer needs.

Read on to uncover operator concerns around delivering AI-ready data centres, the strategies being pursued, and the challenges the industry faces as we navigate a new era of rapid AI adoption.

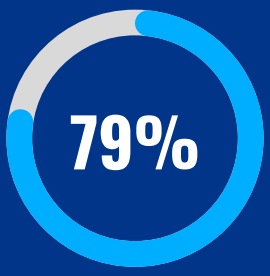
KEY STATS



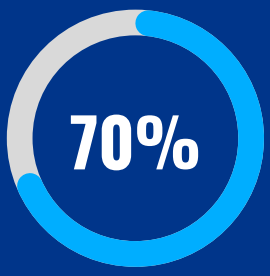
say demand for capacity to support AI has increased in past year



are having to rethink power, cooling and location strategies to meet demand



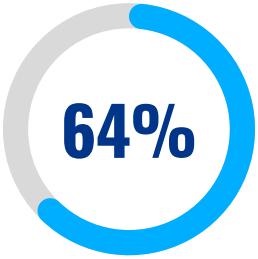
say skills shortages will delay data centre projects



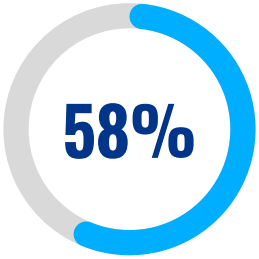
say poor quality cabling will compromise long-term AI readiness

SURGING DEMAND FOR AI CAPACITY

Rising AI demand is a fact of life for data centre operators. In the past 12 months, 92% say that demand for capacity to support AI applications, models, or systems has increased, with an average increase of 42%. With AI workloads increasing exponentially, operators will be under pressure to strategically forecast AI demand, using this to define the purpose of their data centres and how this will impact design considerations.



say demand for capacity to support AI has been higher than expected



expect AI to shorten the lifespan of today's data centres

EVOLVING INFRASTRUCTURE FOR AI

This rising demand is forcing 74% of operators to rethink power, cooling and location strategies. But there is no one-size-fits-all strategy for delivering AI-ready data centres. Operators are looking at a variety of options, with some opting to build new, some opting to retrofit and others doing a mixture of both.

Interestingly, 5% of operators have paused AI infrastructure projects to assess future demands – rising to 12% in Ireland, likely fuelled by the Irish government pausing new data centre developments due to concerns over power and space.

To expand infrastructure to meet demands for AI workloads, operators are:

30%

Building new sites and retrofitting sites, but leaning towards retrofitting

39%

Building new sites and retrofitting sites, but leaning towards new builds

10%

Primarily retrofitting existing sites

13%

Primarily building new sites

THE HUMAN FACTOR

Delivering these new and retrofitted sites is beset by barriers, the biggest of which is people. Attracting talent was cited as the number one barrier to meeting infrastructure demands for AI workloads. 79% of operators believe that the skills shortages will delay data centre projects. Other key people-related barriers included finding the right partners and a lack of design skills.

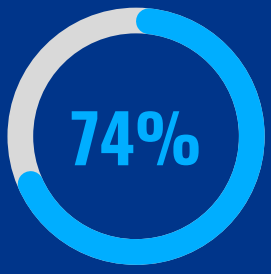
On top of this, more than a quarter (27%) of operators cited a lack of skilled labour for installation and maintenance as being a key cabling challenge. Cabling is the foundation for data centre connectivity and a critical component for AI-compute, with poorly installed and maintained cables leading to data centre degradation.

The barriers operators face in meeting infrastructure demands of AI workloads in the next 12–24 months:

Barrier	%
Attracting talent with AI skills	45%
Government regulations/red tape	30%
Finding the right partners to support us	28%
Sustainability challenges	28%
Competition with other industries for power access	27%
Supply chain disruption	23%
Lack of design skills	18%
Geopolitical turbulence	17%
Accelerated timelines that introduce health and safety risks	16%
Power grid constraints	16%
Poor quality cabling that throttles workloads	13%

CABLING CHALLENGES

Cabling is crucial to data centre design but is an overlooked piece of the puzzle. 70% of operators say that poor quality cabling will compromise long-term AI readiness, so investing in high-quality cabling and the right skills will allow operators to future-proof data centres for AI and whatever comes next.



say demand for capacity to support AI has been higher than expected

Encouragingly, 71% expect AI workloads to improve cabling challenges over the next 12 months, perhaps by driving innovation and investment in more efficient infrastructure.

Cabling skills is one area where operators face challenges, but they also feel under pressure to meet sustainability goals with greener cabling solutions and suffer from supply chain problems. Supply issues are particularly pressing for cabling, where scarce raw materials, disrupted shipping routes and reliance on single-source production can jeopardise project timelines and long-term AI readiness.

The challenges operators face around data centre cabling

Challenges	%
Pressure to meet sustainability goals with greener cabling solutions	32%
Complex, fragmented supply base increasing costs and inconsistency	27%
Lack of skilled labour for cabling installation and maintenance	27%
Supply chain delays and material shortages impacting cabling availability	26%
Difficulty integrating cabling with modular design principles	26%
Insufficient cabling quality leading to performance bottlenecks	25%
Insufficient upfront planning leading to costly retrofits and delays	24%
Cabling not designed for future workloads and bandwidth needs	21%
Poor installation and labelling practices causing troubleshooting delays	20%
Budget constraints that force us to cut corners on cabling quality	19%

OUTSIDE FACTORS ON DESIGN

Operators are being forced to navigate an increasingly constrained environment. 69% of respondents cited US tariffs and geopolitical instability as drivers of rising costs and delays, and 40% warn they are running out of viable locations to build AI-ready data centres. These pressures heighten the risk of rushed or short-sighted decisions that lead to costly mistakes.

61%

have experienced a costly design rework or retrofit due to siloed decision-making during data centre builds.

70%

believe holistic design principles will be critical for building AI-ready data centres.

HOW TO STAY AHEAD IN THE AI INFRASTRUCTURE RACE

AI continues to dominate the conversation among data centre operators. AI workloads are driving huge demand for capacity – a challenge many operators are racing meet. Yet whether operators are building new sites or retrofitting existing ones, one thing is clear: success hinges on taking a holistic approach to design that future-proofs infrastructure and keeps pace up with explosive demand.

A holistic approach to data centre design considers every element as part of a unified system. There are five key principles that underpin this approach.

FIVE KEY PRINCIPLES OF HOLISTIC DATA CENTRE DESIGN

1. FOCUS ON PURPOSE

Define the data centre's strategic direction and make business-driven design decisions.

2. CREATE A SHARED VISION

Break down siloes and align teams around a shared and cohesive design strategy.

3. BE ADAPTABLE

Design for flexibility, interchangeability and scalability to accommodate evolving requirements.

4. USE THE AI ADVANTAGE

Consider AI not only as a workload driver, but as a strategic enabler for design and operational optimisation.

5. BEWARE FALSE ECONOMIES

Prioritise smart investment in the early-stage design to unlock long-term efficiency and resilience.

But design principles alone aren't enough. The skills shortage and continued supply chain volatility mean that operators need the right partner by their side – one with deep domain expertise, purchasing power across global markets, and a team of specialist designers who understand how to align technical delivery with long-term business outcomes.

Working with the right partners who can advise on datacentre design can help operators to maintain the right balance between all aspects of the data centre – from the infrastructure impact of AI to skills, cabling and sustainability. As such, operators can derisk complexity, accelerate deployment, and build AI-ready infrastructure that delivers long-term value.

To learn more about the challenges of AI, the value of holistic design, and how foundational technologies like cabling can support long-term success, speak with Onnec today.

METHODOLOGY

The Onnec survey was conducted by Censuswide between 30th April and 9th May 2025. It interviewed 250 senior decision makers involved with the design, management and running of facilities for data centre operators (hyperscaler/cloud providers, enterprise, colocation providers etc.) in the UK (100), Ireland (50) and Nordics (100). The survey was carried out online.

ABOUT ONNEC

Onnec sits at the centre of connections. We're a single provider of multi-layered data centre solutions – our expertise spans data centre environments, and we support customers with:

- Infrastructure and containment design
- Installation of cabling, ODFs, PDUs and containment solutions
- Network hardware installations, changes and support
- Connectivity and equipment upgrades and changes
- 24/7 fully managed support service

Onnec helps to lay the foundations today that can support your data centre for years to come. Connect with us to learn how we help to deliver business growth and certainty in your data centre.