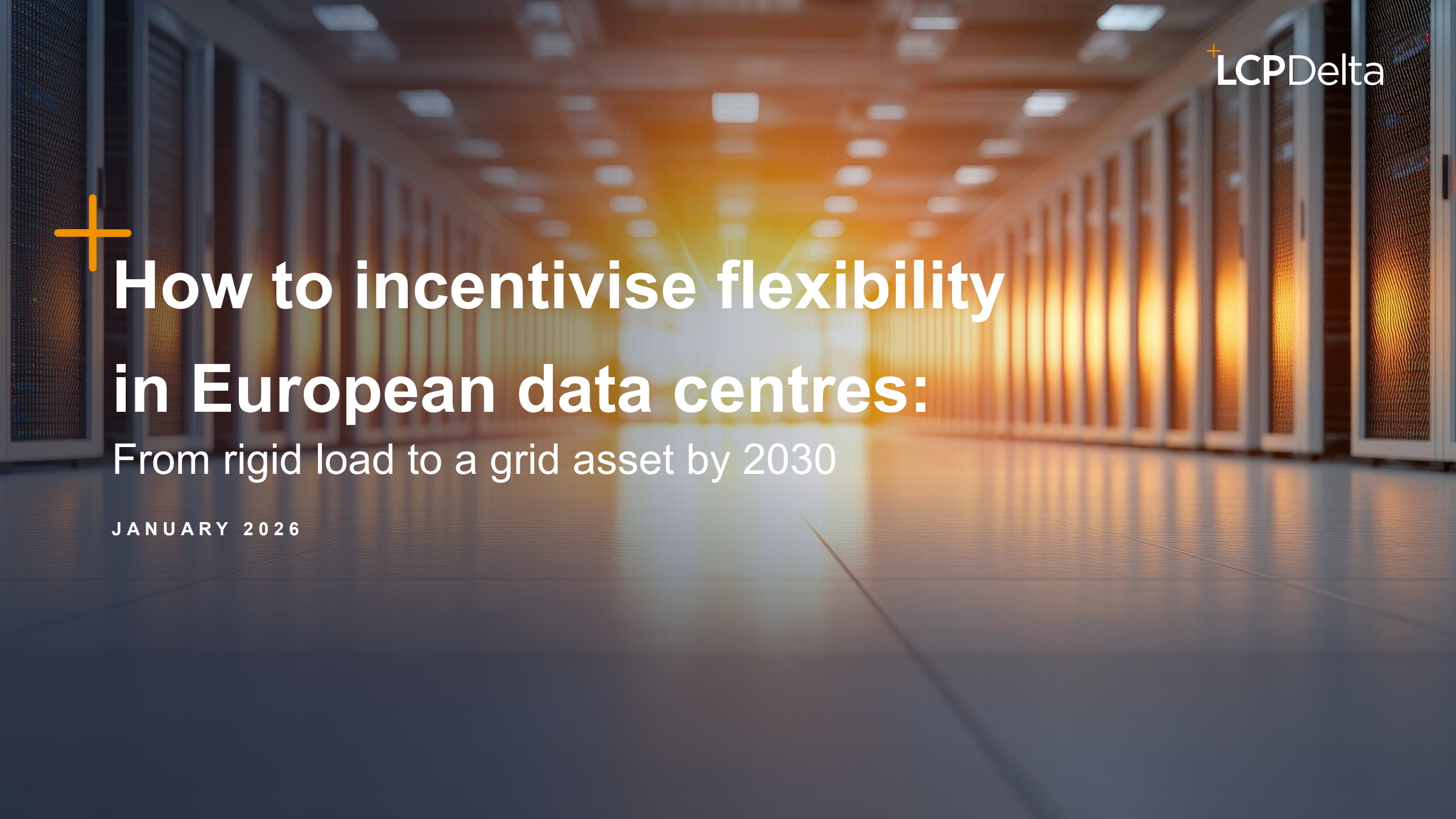

LCPDelta

How to incentivise flexibility in European data centres:

From rigid load to a grid asset by 2030

JANUARY 2026

Executive summary

The rapid expansion of European data centres is creating unprecedented challenges and opportunities for the electricity grid.

With data centre power demand projected to reach 161 TWh by 2030 (from 71 TWh in 2024 across Europe) and grid congestion already high in key regions, the inflexibility of traditional data centre loads threatens system resilience, slows investment, and increases costs for operators and grid stakeholders.

Yet, data centres also hold the potential to become valuable grid assets. By adopting flexibility measures such as demand response, energy storage, and advanced energy management, data centre operators can accelerate grid connections, support renewable integration, and unlock new commercial value streams. Despite technical feasibility, uptake of flexibility remains limited due to cultural resistance, contractual rigidity, and a lack of compelling incentives.

This whitepaper does not prescribe a single solution. Instead, it presents and discusses a set of five **incentive pillars** that can drive meaningful change. Drawing on real-world examples and policy frameworks, we aim to spark a broader conversation among data centres operators, policymakers, investors, and grid operators. By aligning incentives and removing barriers, the industry can transform data centres from rigid loads into active partners in Europe's energy transition.

For access to the full report covering all incentive pillars in depth, please click here

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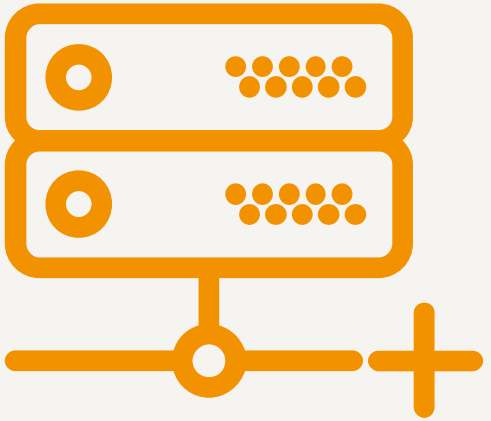


Introduction

"The data centre wave is here, the true size of which remains uncertain, but one thing for certain is that energy systems and data centre operations will need to adopt flexible strategies"

Euan Killengray, C&I Flexibility Lead, LCP Delta

Introduction

The data centre wave, the grid challenge and why flexibility helps

The European data centre wave is here, driven by cloud, AI, and digital services. Demand is expected to reach 161 TWh by 2030[1], a 127% rise from 2024. But this growth is colliding with ageing grids, rising electrification, and long connection queues.

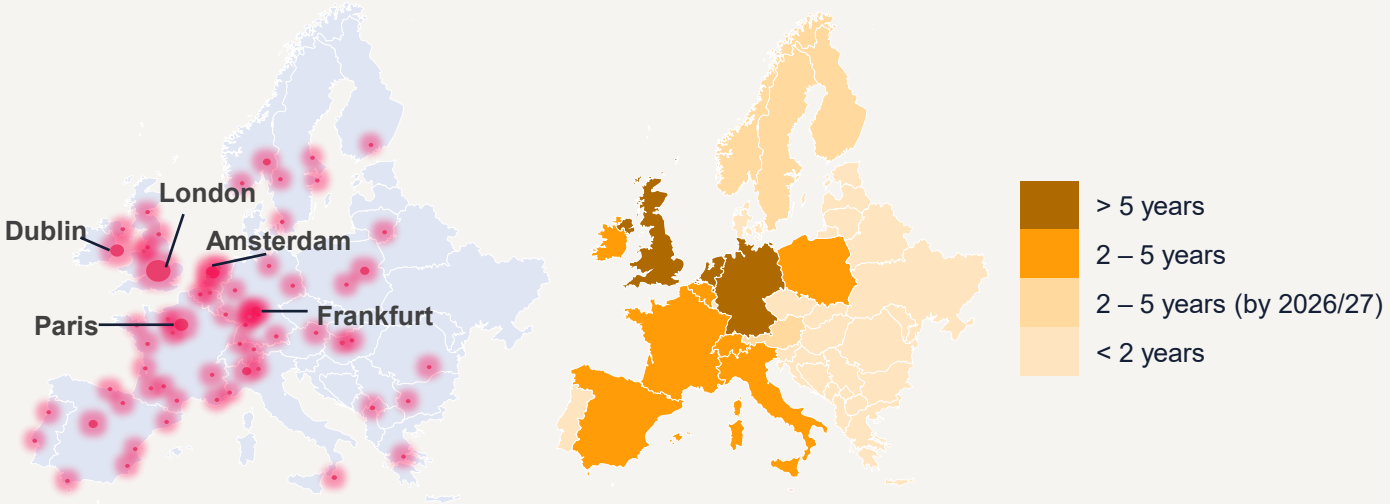
Most development remains concentrated in FLAP-D hubs, where congestion is high and grid connections now take 5–10 years. Less-constrained regions, such as the Nordics and parts of Southern Europe, offer sub-3-year connections and are emerging as viable alternatives.

Inflexible data centre loads worsen congestion and system risk. In 2024, TSOs in FLAP-D countries spent €2.5bn on balancing costs, rising to over €6bn across wider Europe

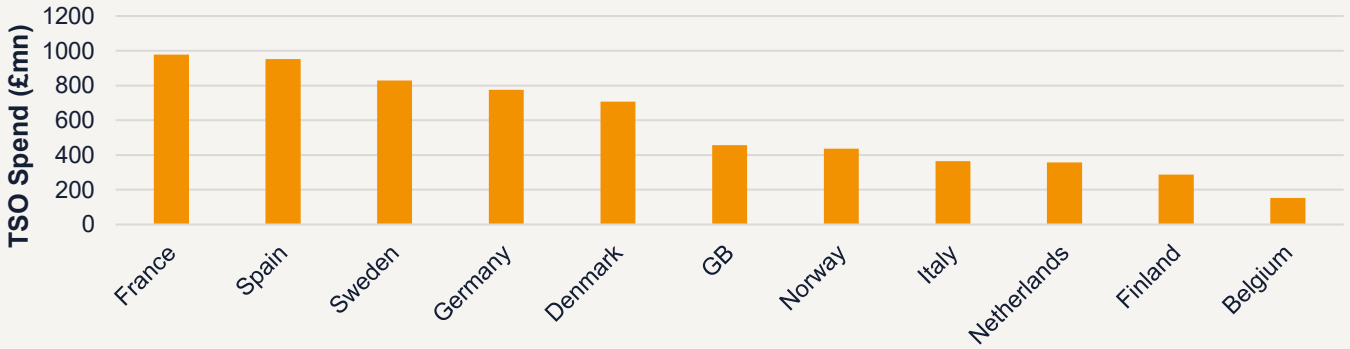
Flexibility, through demand response, on-site generation, storage, or adaptable cooling, can accelerate connections, lower system costs, and create new value streams. Yet uptake remains limited due to **cultural, contractual,** and **incentive** barriers.

This whitepaper sets out **five incentive pillars** to unlock flexibility, offering practical, evidence-based options to align operators, policymakers, investors, and grid stakeholders.

Data centre hubs and grid connection queue times[2]



TSO spend on ancillary services in 2025 (€mn)



Incentive pillars for data centre flexibility

“Flexibility becomes inevitable when incentives align: reform connections, deepen sustainability, protect SLAs, simplify market access, and deliver community value. Together these five pillars turn data centres from rigid loads into resilient, revenue-generating grid assets.”

Euan Killengray, C&I Flexibility Lead, LCP Delta

The case for incentivising flexibility

The opportunity: Reframing the conversation

To unlock the potential of data centre flexibility, the conversation must shift from removing barriers to actively creating and aligning incentives. This means designing policies, market mechanisms, and business models that make flexibility attractive for operators, investors, and wider stakeholders.

This whitepaper proposes a framework of five **incentive pillars** that can underpin this new approach, each addressing a core aspect of the challenge:

Incentive pillars for transforming data centres to grid assets

Incentive Pillar	1. Grid connection reform	2. Sustainability & green credentials	3. Reliability & contractual innovation	4. Market accessibility & financial	5. Resiliency & community value
Why an incentive?	Grid connection delays and costs slowing time to market and investment	Prioritising sustainability commitments are competing with monetary benefits	Uptime is non-negotiable and SLAs guarantee “five nines”. Any flexibility must not jeopardise this	Even with flexible assets, energy market participation is complex and sometimes blocked	Power grid resiliency is reducing, data centres can build their own via flexibility, whilst delivering local benefits
How to incentivise with flexibility?	Non-firm connections, phased energisation, private wires	Renewable matching, emission reductions, ESG compliance	SLA-compliant flexibility, aggregation, automated safeguards	Value stacking, market participation, simplified access	Backup generation, heat reuse, community energy support
Case study example	Ireland’s non-firm connection policy, priority grid access in UK, France and Netherlands	EcoDataCenter in Sweden	Microsoft in Sweden with BESS replacing diesel backup and aggregator partnerships	Google in Belgium’s ancillary services	Meta Odense in Denmark with district heating

Stakeholder perspectives

"Flexibility will scale only when stakeholders line up behind shared incentives. Aggregate loads, standardise market access and share benefits to turn fragmented interests into reliable grid support and commercial upside."

Euan Killengray, C&I Flexibility Lead, LCP Delta

Stakeholder perspectives

Understanding the perspectives of key stakeholders is essential to unlocking the role of data centres in energy flexibility and decarbonisation. Each group brings distinct priorities, challenges, and opportunities that shape how flexibility solutions are adopted. These differences need to be aligned to ensure incentives are correctly poised, as there are common goals and interdependencies which can be met for all relevant stakeholders.

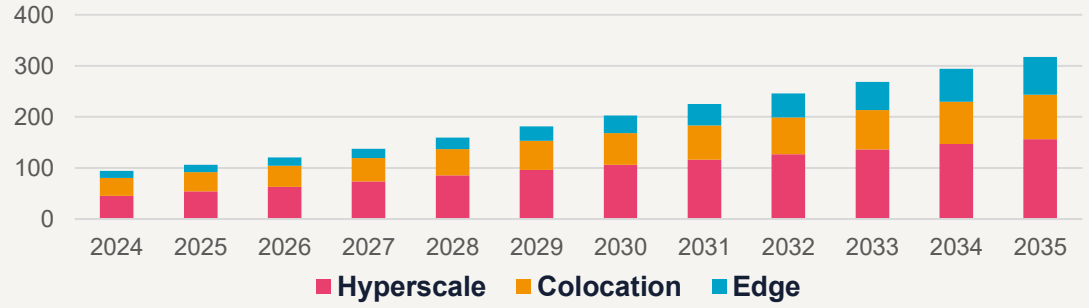
Different types of Data Centre Operators

Data centre operators vary widely in their flexibility potential. **Hyperscalers** (10–500 MW) operate at very large scale with flat load profiles, increasingly shaped by energy-intensive, spiky AI training workloads. Their size, sustainability goals, and operational control make them strong early candidates for flexibility. **Colocation providers** (5–25 MW) face tenant-driven constraints but can aggregate flexible demand to create value. **Edge facilities** (<5 MW) have limited individual revenue potential but, when aggregated, can support local grids, an increasingly important role as 5G, autonomous systems, and AI inference grow post-2030.

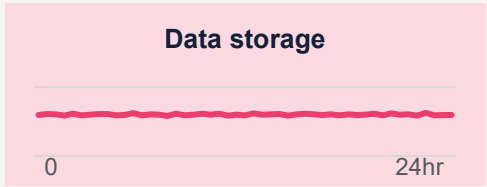
Operational criticality also matters. **Tier 1 centres**, with lower redundancy and risk requirements, are generally more willing to optimise compute loads. **Tier 4** centres host highly critical workloads and prioritise uptime, but their extensive backup systems offer latent potential for grid services if commercial and technical barriers are resolved.

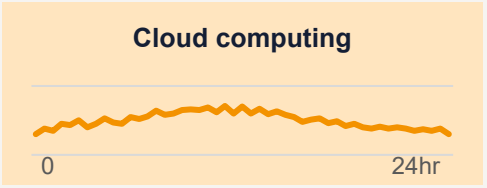
Workload type strongly shapes flexibility. **Data storage** and **core cloud** workloads have stable, high load-factor profiles, while **enterprise** workloads show modest daytime peaks. **AI training** is highly energy-intensive, yet also one of the most schedulable compute tasks, enabling flexibility through time-shifting, throttling, relocation, and coordinated cooling/UPS use when incentives align. Gaming and streaming workloads are latency-sensitive, with clear evening peaks.

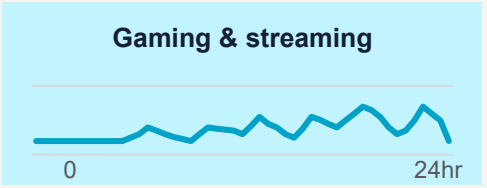
Global data centre capacity growth (GW) projections (by data centre type)



Illustrative loads: Applications with different energy demand profiles







Source: LCP Delta's Powering the Digital Future report (2025)

Policy and market recommendations

"Turn ambition into scale. Streamline grid connections, fund real-world pilots, and tie rewards to hard KPIs (MW of flexibility enabled, time-to-connect and CO_2 avoided) so policy translates into bankable outcomes."

Euan Killengray, C&I Flexibility Lead, LCP Delta

Policy and market recommendations

The need for National and European reforms

Targeted policy and market reforms are needed to overcome the technical, regulatory, and commercial barriers that limit data centre flexibility, while staying aligned with decarbonisation goals and SLAs.

Grid connection rules

Delays in permitting grid connections are now affecting data centres. Streamlined processes like the UK's Connections Action Plan and wider European reforms can accelerate integration. Grid codes should prioritise projects that provide system benefits such as DSF or on-site generation.

Demonstration pilots

Pilots are key to proving feasibility. The EPRI DCFlex Europe project with key operators will deliver 5–10 flexibility hubs across France, the Netherlands, and Greece (2025–27). Regulators should fund additional national pilots with clear pathways to scale.

Sustainability-linked incentives

Linking financial benefits to verified sustainability outcomes can drive adoption. Tools like France's Energy Efficiency Certificates and the EU Taxonomy offer a model. Similar incentives, reduced grid fees, flexibility credits, or time-shifting carbon certificates, could reward data centres providing measurable system value.

National level

Update grid codes and market rules, clarify participation requirements, and introduce incentives that reward flexibility while easing permitting for behind-the-meter assets.

EU level

Harmonise flexibility market frameworks, establish shared sustainability standards under the Green Deal and Fit for 55, and expand funding for cross-border innovation.

Metrics and KPIs for success

To ensure data centres are being integrated in a flexible way, the following metrics would need to be tracked and fulfilled:

- **Flexibility capacity enabled:** MW of data centre load connected to markets.
- **Participation rate:** Number of operators providing flexibility services.
- **Carbon reduction impact:** Tonnes of CO_2 avoided through flexibility.
- **Time-to-connect:** Average duration for grid connection approvals.
- **Pilot outcomes:** Number of successful demonstrations scaled to market.
- **SLA breaches:** Number of SLA breaches due to flexibility measures.

Strategic recommendations

1. **Accelerate permitting and grid connection for flexibility assets**, following best practices from Ireland, and what is being developed in the UK and Germany.
2. **Launch national and EU-funded demonstration programmes**, building on EPRI's DCFlex project.
3. **Introduce harmonised sustainability-linked incentives**, leveraging EU Taxonomy principles to reward measurable carbon reductions.
4. **Develop transparent KPIs** to track progress and ensure accountability across stakeholders.

Conclusion

This whitepaper has set out the fundamentals for transforming European data centres from rigid consumers into active grid assets by 2030. Through the lens of five **incentive pillars**: **Grid Connection Reform**, **Sustainability & Green Credentials**, **Reliability & Contractual Innovation**, **Market Accessibility & Financial Incentives**, and **Resiliency & Community Value**, we have shown how targeted reforms and aligned incentives can unlock flexibility at scale.

The evidence is clear. When operators are incentivised to provide flexibility, the benefits extend far beyond individual sites. Faster and cheaper grid connections, improved system resilience, enhanced sustainability credentials, and new value streams are all within reach. Real world examples, from Ireland's non-firm connection policy to Google's BESS-enabled market participation in Belgium, demonstrate that these approaches are not theoretical, they are already delivering results where barriers have been addressed.

However, the journey is far from complete. Many operators remain hesitant, constrained by regulatory uncertainty, contractual rigidity, and unclear financial rewards. To move forward, stakeholders must work together to remove these perceived barriers and create a compelling case for flexibility. This means streamlining grid connection processes (as proposed in Ofgem's GB demand connection queue reforms), funding demonstration pilots that prove technical and commercial viability, and introducing sustainability-linked incentives that reward measurable carbon reductions. National and EU-level action must be coordinated to harmonise frameworks, set clear standards, and provide the right signals for investment.

Now is the time for action. Data centre operators, system operators, regulators, technology providers, and investors all have a role to play in piloting, refining, and scaling these approaches. Flexibility must become a core design and operational strategy, not a secondary concern. By engaging in collaborative pilots, shaping market rules, and sharing best practices, the industry can unlock new value and accelerate the energy transition.

At LCP Delta, we are committed to driving this conversation and supporting stakeholders on the journey. We invite industry partners, policymakers, and innovators to engage with us, whether to discuss opportunities in flexibility markets, refine incentive frameworks, or develop transparent KPIs for success. Together, we can turn flexibility from a challenge into a shared opportunity, delivering commercial, environmental, and community benefits across Europe.

More from our team

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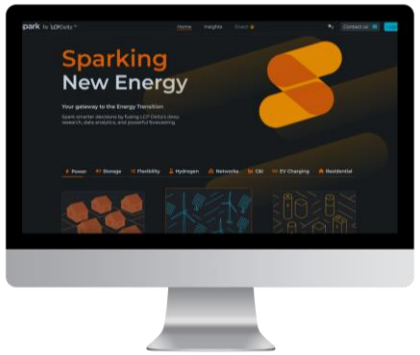

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Join us at our new energy industry events and webinars throughout the year to explore our latest research with the energy industry.

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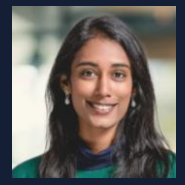

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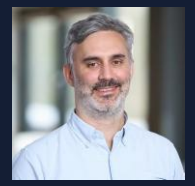

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Appendix

Footnotes

[1] LCP Delta's Powering the Digital Future report (2025). Our modelling shows total installed data centre power capacity (for servers, IT storage, and networking equipment, plus cooling, lighting, and ancillary power needs) in Europe growing from 22GW in 2024 to 38GW by 2030. Connection capacity utilisation assumed to grow from 37% to 48% (with variations across hyperscale, co-location, edge, and enterprise data centres).

[2] Grid connection queue time considers point from formal connection application to fully-energised grid connection for a large data centre, assuming some grid reinforcement is needed. **Note:** 'Queue' years in map only relate to grid-constrained local areas rather than a nationwide issue.

[3] A formal contract between a data centre provider and its customer that defines performance standards, such as uptime guarantees, response times, and support commitments. SLAs typically include availability targets (eg. 99.999% uptime), penalties for non-compliance, and metrics for monitoring service quality.

[4] 'Five nine' reliability refers to a service availability level of 99.999% uptime, meaning the system or service is operational and accessible for all but approximately 5.26 minutes per year. In data centre contracts, this metric is often guaranteed through Service Level Agreements (SLAs), ensuring near-continuous availability for mission-critical applications.

[5] LCP Delta's Data Centre Investment Attractiveness report (2025). We apply our proprietary market scoring methodology to analyse the top data centre hubs (with top spots spread across existing top-tier hubs and emerging markets).

[6] A type of data centre operated by large cloud service providers (eg. AWS, Microsoft Azure, Google Cloud) designed for massive scale, supporting thousands of servers and petabytes of storage. Hyperscalers enable elastic computing resources and global cloud services, optimised for scalability and efficiency.

[7] A data centre model where multiple businesses rent space for their own servers and networking equipment within a shared facility. The provider offers power, cooling, physical security, and connectivity, while customers maintain control over their hardware and applications.

[8] Power Usage Effectiveness (PUE) is a metric that measures data centre energy efficiency, calculated as the ratio of total facility energy to IT equipment energy. A PUE of 1.2 indicates that only 20% additional energy beyond IT load is used for cooling, power distribution, and other overheads. Considered excellent, as most modern data centres average around 1.4-1.6.

[9] https://europe.epri.com/press-releases/epris-data-center-flexibility-and-grid-reliability-initiative-expands-europe