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London's Data Centre Future Growth Forecasts and Strategic Insights

An evidence-based report for the Greater London Authority (GLA)

December 2025

Contents

Executive Summary

London's data centre sector is undergoing a significant transformation, driven by rising digital demand, evolving national policy frameworks, and mounting infrastructure constraints. As Europe's most interconnected hub within the FLAP-D network (Frankfurt, London, Amsterdam, Paris, Dublin), London's global economic positioning and proximity to transatlantic fibre routes have long made it a preferred destination for data centre development. In 2025, operational capacity stands at approximately 1 GW, with grid connection data indicating **potential growth of up to ten-fold by 2050**. This scale of expansion positions London as a critical enabler of the UK's ambitions for artificial intelligence, digital sovereignty, and accelerated cloud adoption, while underscoring the need for scalable, secure, and sustainable infrastructure to maintain competitiveness and resilience.

- **Policy context:** National policy now recognises data centres as Critical National Infrastructure, requiring local plans to allocate suitable sites and streamlining approvals for large projects through new planning frameworks. The London Growth Plan positions digital infrastructure, including data centres and edge computing, as essential to London's economic growth and innovation.
- **Spatial patterns and growth:** London's data centres exhibit a clear east–west spatial pattern, with established clusters in the Isle of Dogs, Park Royal, and Hayes, and emerging activity in outer boroughs such as Hillingdon and Barking & Dagenham. As of November 2025, there are 99 operational sites and 26 in the planning pipeline, predominantly north of the Thames. Land scarcity and infrastructure bottlenecks are pushing new developments toward outer boroughs often requiring long-distance grid connections.
- **Infrastructure challenges:** Energy is the single most critical constraint on London's data centre growth. Transmission grid capacity limitations have emerged particularly in West London, and new connection timelines for data centres may range from 7 to 13 years, as compared to 3 to 7 years in other European markets. Recent Ofgem analysis highlights an unprecedented surge in demand connection applications, far exceeding even the most ambitious forecasts. This surge is creating systemic risk for timely delivery of strategic projects, including data centres, and has prompted Ofgem to accelerate Connections Reform under the Clean Power 2030 mission. The reform introduces a shift from "first come, first served" to "first ready and needed, first connected", prioritising projects that meet readiness criteria and align with national strategic goals.
- **Growth forecasts and strategic readiness:** Based on grid connection data and Future Energy Scenarios (FES), London's data centre capacity could grow to between 8 GW and 11 GW by 2050. These projections underscore both the scale of demand and the risk of unsustainable growth in an already constrained environment. To navigate this challenge, improved data transparency and consistent local frameworks will be essential to enable informed, long-term decision-making and targeted infrastructure investment.
- **Strategic infrastructure planning:** London's data centre sector faces complex challenges related to underlying land supply, utility provision, and sustainable growth. Coordination between utilities, planning authorities, and the data centre market is currently fragmented, which can lead to uneven development and missed opportunities for optimisation. Currently, water-related considerations, such as sustainable cooling, abstraction, and discharge, are not comprehensively addressed. Similarly, energy planning often relies on aggregated demand data rather than site and sector specific utilisation, making it harder to anticipate real infrastructure needs from the data centre sector and schedule timely upgrades.

This study forms part of the evidence base for the new London Plan and the upcoming London Infrastructure Framework refresh which will help set the infrastructure priorities for London to meet the Mayor's growth and decarbonisation ambitions[4]. While it seeks to provide an objective view of data centre growth in London, this study acknowledges significant uncertainty in projections and datasets. This uncertainty creates opportunities to improve coordinated planning and enhance data transparency across development and infrastructure.

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Section 1

Introduction

This section sets out the purpose of the report and defines its objectives to support the Greater London Authority (GLA) by establishing a robust evidence base for data centre development in London. This report is intended as a formal input into the next iteration of the London Plan, act as an input into the Economic and Infrastructure Uses Demand and Supply Study and may also inform local planning. It introduces the role of data centres as key infrastructure for London's digital economy, outlining their core functions and enabling requirements.

Introduction and report objectives

Why the Greater London Authority (GLA) requires an evidence base to inform London's digital infrastructure future.

This report has been developed for the Greater London Authority (GLA) to enhance understanding of data centre development across London and the associated impact on enabling infrastructure. It integrates spatial analysis with planning, utility, policy, and market data to provide an objective foundation for decision-making, positioning data centres within London's wider planning context.

Data centres are a vital component of London's growing digital economy, as recognised in the London Growth Plan[1]. London's position within the FLAP-D data centres markets reflects its global economic significance, high connectivity, and proximity to end-users. As demand for digital services grows, so does the need for supporting physical infrastructure. This expansion brings spatial and infrastructure challenges, including competition for industrial land, increased pressure on electricity distribution networks, environmental considerations, water availability, and long-term planning.

Ofgem's November 2025 letter highlights the importance of addressing the surge in demand connection applications, largely driven by growth in data centres, to "mitigate the risk of misallocating resources and undermining network planning, which ultimately creates inefficiencies across the electricity system". In areas such as West London, increased development activity has coincided with grid constraints and planning pressures. At the same time, data centres may offer additional benefits such as waste heat recovery, depending on site-specific integration.

This report recognises these regulatory and planning changes by providing the GLA with a regional analysis of data centre supply, demand, and infrastructure constraints across London. It contributes to the evidence base for the development of the next London Plan, aligning with recent updates to the National Planning Policy Framework, which emphasises the importance of considering data centre development in planning policy and governance[2]. It provides a detailed, sector-specific evidence base that complements the broader Economic and Infrastructure Uses Demand and Supply Study, supporting the targeted identification of land supply and demand for data centre development.

Findings will also inform the 2026 London Infrastructure Framework (LIF) refresh, and other GLA-led studies[3,4]. By identifying key trends and insights, the analysis contributes contributes to LIF development and on-going GLA support to accelerate the infrastructure investment needed to support growth and decarbonisation.

Objectives

1. **Establish an evidence base for the development of the next London Plan:** Provide a robust assessment of data centre demand, development patterns, and infrastructure impacts across London, drawing on available planning and utility data, policy documents, and market insights.

2. **Support the development of the 2026 London Infrastructure Framework (LIF):** Insights from this study on the growth of the data centre sector will support the LIF in outlining the strategic infrastructure needed to unlock sustainable, climate-resilience economic and housing growth in London by 2050.

3. **Enhance spatial understanding:** Analyse the geographic distribution of existing and emerging data centre activity by establishing an enhanced GIS dataset including GLA planning data combined with private sector data, to support spatial planning, land use decisions, and infrastructure coordination across London.

4. **Assess future growth:** Evaluate potential trajectories for future data centre development beyond currently proposed sites, by identifying broader market trends, technological drivers, and long-term infrastructure implications.

5. **Support strategic planning and policy alignment:** Generate insights to inform the Local Area Energy Plans (LAEPs) and other strategic initiatives, ensuring digital infrastructure growth is considered alongside wider city priorities.

6. **Enable coordinated and informed decision-making:** Provide a shared evidence base to support cross-sector collaboration and strategic oversight of data centre development across London's planning, energy, and infrastructure systems.

The role of data centres in London’s economy

Data centres are vital to the UK’s digital infrastructure, powering cloud services, connectivity, and innovation.

As a key digital hub, London is home to a significant share of the UK’s data centre capacity and is recognised as the leading city in Europe, the Middle East, and Africa, for data centre development. The London Growth Plan outlines a 10-year strategy to **restore productivity growth to 2%**, aiming to expand London's economy by £107 billion by 2035[1]. Data centres and digital infrastructure are identified as important to this ambition, powering high-value sectors such as finance, technology, life sciences, and the creative industries.

With around 80% of the UK’s data centre capacity located in London, the capital is well positioned to realise much of the sector’s economic benefits, estimated by techUK at **£4.7 billion in annual GVA,** with a further £44 billion potential by 2035[5]. The London Growth Plan **links London’s future prosperity to the growth of data centres**, framing them as an important contributor to closing the productivity gap and enabling inclusive, innovation-led growth.

International evidence, such as from the State of Virginia, USA, shows that data centres can deliver significant early economic gains through construction activity, tax revenue, and supply chain development[6]. However, their long-term direct impact on local economies has historically been limited due to their capital-intensive nature and relatively low operational employment. That said, the next generation of data centres may shift this dynamic, suggesting the need for strategic planning to ensure sustained and inclusive benefits over time.

A hub for digital innovation, AI, and advanced services: London’s data centres can provide the low-latency, high-performance infrastructure essential for AI, real-time data applications, and digital transformation across public and private sectors. Their proximity to dense fibre networks and high demand industries, positions London favourably in a global context. The UK Government in the AI Opportunities Action Plan identifies data centres as “the engines of the AI age,” essential for training and deploying AI models across sectors such as healthcare, education, and public service[7]. At a city level, the London Growth Plan highlights data centres as key to unlocking productivity and driving innovation-led growth in industrial innovation corridors and emerging sectors.

London’s operational resilience and security: In 2024, the UK Government designated data centres as Critical National Infrastructure (CNI), the first new CNI sector in nearly a decade, formally recognising their role in digital sovereignty, business continuity, and disaster recovery amid mounting cyber and climate risks[8]. Separately, the Government has also signalled its intention to allow data centres to be brought within the Nationally Significant Infrastructure Projects (NSIP) regime. While the CNI designation highlights their strategic importance to the UK economy and security, the potential for designation as NSIPs would have direct implications for planning.

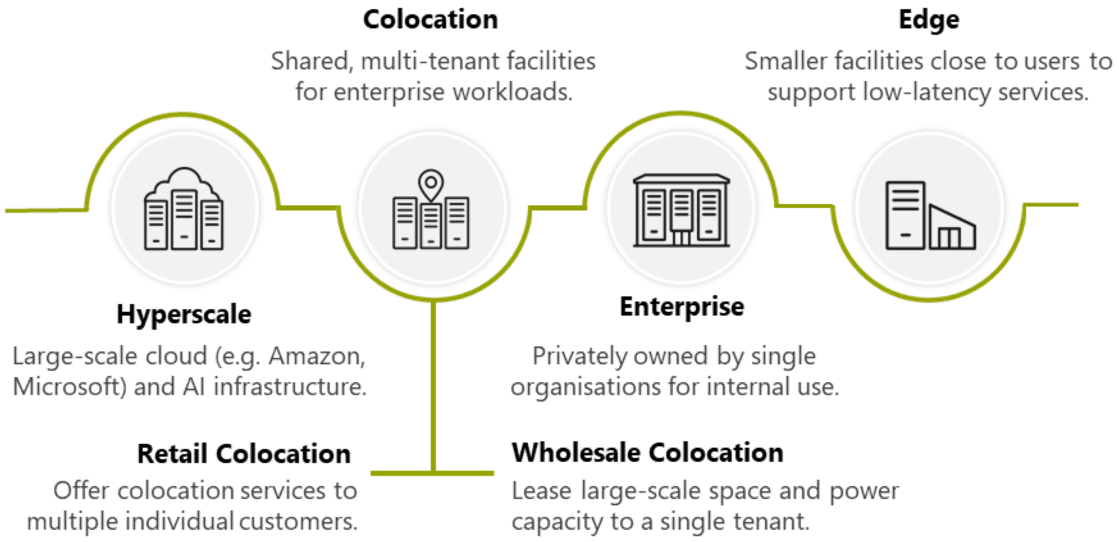
London’s position as a smart, connected global city: The London Growth Plan, supported by the forthcoming 2025 London Infrastructure Framework, highlights data centres as critical infrastructure enabling the city’s evolution into a smart, data-driven global capital[4]. By underpinning the digital operation of essential services, from mobility and energy to healthcare, data centres make possible efficient, interconnected urban systems and resilient public service delivery. Nationally, the UK Government’s Smart Data Roadmap also cites data centres as foundational for enabling urban transformation across the country, with a particularly strong focus on London’s advanced needs[9].

Data centres and their infrastructure requirements

From enterprise to edge, data centres come in many forms, each with distinct infrastructure needs to support performance, scalability, and resilience.

What are data centres?

Data centres are secure, warehouse-like facilities that house the information technology (IT) equipment such as computing, storage, and networking systems, upon which almost all digital activity relies. According to the UK Government, they "underpin almost all economic activity and innovation, including the development of AI and other technology, public service delivery, and how we interact with one another[10].



Data centre development varies by organisational type. For example, hyperscale and enterprise facilities are typically built by end-users, such as cloud providers or financial institutions, to meet specific operational needs. In contrast, colocation centres are developed by third-party operators aiming to attract multiple tenants, making them the most commercially driven and market-responsive typology.

Summary of integrated infrastructure requirements for data centres

Delivering data centres requires the integration of multiple infrastructure systems, each with specific thresholds and spatial demands. Site viability depends on land availability, aligned with power, fibre, and cooling access within London's dense urban fabric. This complexity demands long-term planning, infrastructure upgrades, and spatial adaptability. National policy, through the 2025 and the revised 2024 National Planning Policy Framework (NPPF) emphasises the need for planning policies and decisions to take into consideration the specific spatial needs and requirements of data centres[11,12].

Location Proximity (Latency): Typically located near infrastructure and high end-user demand to optimise workload performance. This often results in clustering due to shared infrastructure access rather than intentional planning.

Land Size and Suitability: Sites are typically located in industrial, or commercial land, and must support building massing, access, servicing, and specialised operational needs.

Power Demand: Require high-capacity, resilient power infrastructure, often at transmission or primary distribution voltage. Power needs typically range from 10 to 100+ MW per data centre, shaped by substation capacity and grid availability.

Cooling Needs: Cooling systems, either air or water-based, require adequate space, environmental permissions, and long-term resilience. Key considerations include water abstraction, air discharge, and environmental thresholds.

Digital Infrastructure: Reliable, high-density connectivity is essential. Proximity to fibre routes, exchanges, and hubs support low-latency performance and global integration.

Data centre typologies: typical infrastructure requirements

This matrix highlights four data centre typologies with typical characteristics and indicative ranges for power, connectivity, cooling, footprint, and end-user proximity.

	Latency			Land size & suitability			Power demand			Cooling needs			Digital infrastructure		
	Low	*Mid*	*High*	*Low*	*Mid*	*High*	*Low*	*Mid*	*High*	*Low*	*Mid*	*High*	*Low*	*Mid*	*High*
HYPERSCALE *(Once rare, now rapidly emerging across Greater London)* • **Power:** 100+ MW, with dedicated grid connections / substation infrastructure. • **Connectivity:** Multiple diverse high-speed fibre routes, carrier-neutral interconnection, and direct links to cloud regions and subsea cables. • **Location and Land:** Large campuses spanning 4–20+ hectares, located near substations and transport links on brownfield or greenfield sites at city edges.	●			●	●	●	●	●	●	●	●	●	●	●	●
COLOCATION *(Typical across Greater London)* • **Power:** Once ranged from 5–50 MW, with new developments reaching 100+ MW. • **Connectivity:** Strong carrier presence and access to internet exchanges (e.g. LINX, Telehouse); latency-sensitive workloads benefit from proximity to city cores. • **Location and Land:** Medium to large (0.4–4 hectares), typically on designated industrial land or retrofitted commercial buildings.	●	●		●	●		●	●	●	●	●		●	●	●
ENTERPRISE • **Power:** 1–10 MW, may use shared infrastructure or leased power feeds. • **Connectivity:** Constrained, with limited carrier choices and private networks, • **Location and Land:** Retrofitted into existing buildings or campus environments.	●	●		●			●	●		●	●		●	●	
EDGE • **Power:** <1 MW per site, prioritising efficiency and rapid deployment. • **Connectivity:** High-density fibre interconnections to mobile networks, enterprise sites, and cloud services. • **Location and Land:** Compact formats including street cabinets, telecom rooms, or modular enclosures. Typically deployed in dense urban areas or utility-owned land.	●	●	●	●			●			●			●	●	

Appendix 2 includes a detailed table of data centre typologies with key characteristics and example operators, as well as descriptions of the thresholds outlined in this matrix.

An introduction to data centre workload types

Workloads have distinct spatial and infrastructure needs, with some requiring proximity to end users or data sources to minimise latency (delay in processing), while others can operate at greater distances. These variations influence where facilities are ideally located, whether in dense urban areas, on the urban edge, or rural areas.

Workload Type	**Power Requirement**	**Latency Sensitivity**	**Spatial Implications**	**Primary Drivers**
The nature of the computational task	Typical power requirement per rack for given workload	How critical response time is for each workload type's optimal performance.	The geographic placement requirements and constraints for each workload type	Core business, technical, or regulatory drivers of demand for each workload type
Cloud Infrastructure Workloads (IaaS, SaaS)	Holds multiple servers; draws **5–20 kW**[13]**.**	**Moderate:** SaaS apps require responsiveness (<100ms), and IaaS can tolerate higher latency.	Requires regional and global distribution for efficiently and compliance, typically in centralised cloud regions[20].	Driven by cost savings, scalability, and agility. Supports rapid deployment, remote work, and digital transformation.
AI Training	Houses multiple AI nodes; can exceed **30–100 kW** for high-density AI clusters[14].	**Low**: Batch-oriented and tolerant of latency.	Can be deployed in remote or centralised hyperscale data centres with high power and cooling capacity.	Focused on innovation, competitive edge, and automation. Enables development of proprietary models and advanced R&D.
AI Inference	**5–20 kW,** with several inference nodes[15].	**High**: Real-time responses (<50ms) for user experience and automation.	Needs edge or near-user deployment to minimise latency.	Growth of AI-enhanced services, digital assistants, intelligent search
Telecoms (e.g., 5G Core)	**5–15 kW** per rack with aggregated network nodes[16].	**Very High:** Ultra-low latency (<1ms).	Requires highly distributed edge infrastructure aligned with network topology, often co-located with cellular infrastructure.	National 5G rollout, smart infrastructure, mobile data demand
CDN/Content Delivery	**5–15 kW**, with multiple nodes per rack[17].	**Moderate:** Target response times under 100ms.	Requires extensive geographic distribution with edge servers and PoPs near users and internet exchanges	User experience, bandwidth for Video, gaming, web applications, global CDN presence
Enterprise Workloads	**5–20 kW** depending on density[18].	**Varies (Low-Moderate):** Most apps tolerate 100–500ms; interactive apps may need <50ms.	Often close to business operations, using on-prem, colocation, or hybrid cloud setups for compliance and performance.	Business continuity, cost efficiency, security, compliance, and agility.
Data in Motion	Multiple streaming nodes may bring rack totals to **10–15 kW** in dense setups[19].	**Moderate:** Requires millisecond to microsecond latency for real-time analytics.	Needs distributed architecture with edge nodes, regional aggregators, and core analytics centres.	Real-time insights, operational monitoring, customer experience, and risk management.
High Performance Compute (HPC)	**30–100 kW;** High-density rack[14].	**Variable:** Tightly coupled apps need ultra-low latency; loosely coupled apps tolerate more.	Typically centralised in supercomputing centres or enterprise clusters	Scientific research, engineering simulation, financial modelling, and AI training.

Data centre workload relevance to London

London is critical for latency-sensitive workloads like financial trading and AI inference, which need proximity to hubs such as the Isle of Dogs financial centre. Delay-tolerant, energy-intensive tasks like AI training and backups fit better in regional sites due to space, power, and cost.

Workload Type	Relevance to London
Cloud Infrastructure Workloads (IaaS, SaaS)	**High:** London is a strategic hub for cloud service consumption, particularly among financial services and enterprise sectors. While hyperscale data centres are typically located outside Greater London due to space and cost constraints, London remains central to demand and orchestration. The UK's Cloud First Policy continues to encourage public sector cloud adoption, with London as a key market[21].
AI Inference	**High:** London's dense user base and enterprise demand make it a critical location for low-latency AI inference services. The UK Compute Roadmap highlights the importance of edge infrastructure in urban centres like London to support real-time AI services[11].
Telecoms (e.g., 5G Core)	**High:** London is a major node in the UK's telecom infrastructure. The UK Wireless Infrastructure Strategy, still guiding current policy, identifies London as a key area for 5G rollout, edge data centres, and mobile connectivity[22].
CDN/Content Delivery	**High:** London's role as a global communications hub and home to the London Internet Exchange (LINX) makes it vital for CDN performance. The London Plan Digital Connectivity Infrastructure Guidance supports digital infrastructure expansion to meet growing content delivery needs[23].
Enterprise Workloads	**High:** London's concentration of corporate HQs and financial institutions drives demand for secure, compliant, and highly connected data centres. The DSIT Data Centre Capacity Study highlights London's importance for enterprise workloads[24].
Data in Motion	**Moderate to High:** London's position on national and transatlantic fibre routes makes it a key hub for streaming, analytics, and inter-data centre communication. The UK Infrastructure: A 10 Year Strategy, reinforces the importance of high-capacity digital infrastructure, with London playing a central role in supporting data transit and connectivity across the UK's digital economy[25].
High Performance Compute (HPC)	**Moderate**: London supports financial and academic HPC use cases, but large-scale clusters are typically deployed in regional supercomputing centres. The UK Government and techUK highlight regional HPC investments in places like Oxford, Cambridge and Edinburgh[26].
AI Training	**Low:** London remains a global centre for AI talent and research. However, high-density, power-intensive AI training workloads are increasingly being deployed in outer regions due to infrastructure limitations. These include limited availability of large-scale power connections, and spatial constraints that make it difficult to accommodate the physical footprint of advanced compute facilities. The UK Compute Roadmap 2025 identifies the need for regional AI infrastructure beyond London, and to date, all designated AI Growth Zones have been located outside the capital, reflecting spatial and energy constraints within the city[11].

Note: The relevance of each workload type to London was assessed on a relative scale (high, moderate, low) based on factors such as infrastructure suitability (power, latency, space), UK policy direction, and market demand in sectors like finance, telecoms, and AI. Rather than fixed thresholds, the scale reflects comparative relevance, highlighting London's strength in real-time, compliance-sensitive, and enterprise workloads, while noting decentralisation of energy-intensive, delay-tolerant operations.

Section 2

Data centre development patterns across London

This section examines the scale and spatial distribution of London's existing data centres, drawing on a newly developed GIS baseline dataset which includes GLA planning data combined with private sector data. It identifies historic and emerging development patterns, alongside evolving infrastructure trends. The section establishes a geospatial overview of current stock, highlighting key activity hotspots and growth corridors. It also introduces major clusters, explores the drivers behind their formation, and profiles notable projects shaping London's digital infrastructure landscape. This landscape is continually evolving, and this section provides a snapshot as of end 2025.

London’s historical data centre evolution

From telecoms interconnection to cloud leader, London’s data infrastructure has expanded in phases, each reshaping the city’s digital geography and readiness for the future.

Over the past thirty years, London has emerged as one of the world’s most strategically significant data centre markets. The city’s infrastructure has evolved in response to shifting digital demands, innovation cycles, and urban development pressures. This section provides a spatial analysis of London’s data centre landscape, examining how facilities are distributed, what patterns have emerged, and how location is influenced by factors such as power availability, fibre access, land use, and policy. To contextualise this distribution, four major development waves are outlined, each marking a distinct phase of technological and market evolution that has shaped the geography of London’s digital infrastructure.

Wave 1: Carrier-Neutral origins (~1985–2000)

- **Drivers**: Growth of international telecoms through trans-Atlantic fibre cables[27].
- **Typologies**: Small colocation sites (1–2 MW), often in repurposed warehouses.
- **Key development milestone**: Telehouse North (1990) – Europe’s first purpose-built, carrier-neutral facility and home to London Internet Exchange (LINX), a major internet exchange point which allows content providers to peer and exchange internet traffic to improve latency[28].
- **Geography**: Clustered in East London Isle of Dogs and fringe commercial districts.
- **Infrastructure context**: Early fibre aggregation, with modest power requirements. Planning was reactive, with minimal foresight or coordination.

Wave 2: Financial services & latency-led expansion (~2000–2010)

- **Drivers**: Dot-com boom and demand for low-latency trading infrastructure.
- **Typologies emerging**: enterprise and multi-tenant colocation (2–5 MW), often retrofitted.
- **Key development milestone**: Global Switch East (2002), and Telecity Harbour Exchange consolidations[29,30].
- **Geography**: Central London and West End locations, close to financial institutions.
- **Infrastructure context**: Increased power densities, early on-site high-voltage connections. Planning remained mostly reactive, with limited strategic coordination.

Wave 3: Cloud growth (~2010–Present)

- **Drivers**: Rise of public cloud platforms (AWS, Azure, Google Cloud), enterprise digital transformation, SaaS adoption, UK data sovereignty concerns.
- **Typologies emerging**: The rise of modern colocation facilities (5–20 MW), purpose-built data centres, and edge-ready builds.
- **Key development milestone**: AWS and Google UK cloud regions.
- **Geography**: West London/ outer boroughs expansion such as Park Royal, Hayes, and Enfield.
- **Infrastructure context**: High-voltage substations, modular UPS/cooling, power constraints in core zones. Planning shifted to strategic land-grid coordination.

Wave 4: AI growth (~2020–Present)

- **Drivers**: AI/ML workloads, strategic government support, high-density compute.
- **Typologies emerging**: Data centre campuses (40–100+ MW), high-density colocation with liquid cooling, modular/prefab builds, edge data centres.
- **Key development milestone:** Notable projects include Segro/Pure Data Park Royal campus[31].
- **Geography**: West London boroughs such as Ealing, Hillingdon, and Brent.
- **Infrastructure context**: These developments face grid strain, prompting investment in battery storage, hybrid power systems for energy optimisation. Planning is becoming more proactive.

London's digital clusters: Infrastructure legacy and spatial patterns

Historic forces and infrastructure requirements have created distinct clusters in Availability Zones and Cloud Zones, forming concentrated digital infrastructure hubs across London.

London's digital infrastructure has evolved through decades of strategic investment in electricity, fibre networks, and land-use policy. Targeted infrastructure investment in specific regions has enabled the emergence of digital clusters and regions with digital-ready infrastructure. This growth has been encouraged by three key factors:

1. **Electricity grid connection:** West London and London's Isle of Dogs have historically offered robust electricity infrastructure, with facilities like Telehouse's campus, which operates a private dual 132kV substation with 50MVA capacity, making it one of Europe's more power-secure data centre hubs. Similarly, West London benefits from proximity to major grid and fibre infrastructure along the M4 corridor, supporting development in areas like Hayes and Slough.

2. **Fibre spine and key network routes:** London's fibre spine is a high-capacity backbone connecting data centres, internet exchanges, cloud gateways, and commercial hubs. These routes act as critical utilities, delivering low-latency, high-bandwidth connectivity and increasingly make use of TfL's extensive underground assets, which adds routing diversity and strengthens inter-borough resilience.

3. **Strategic Industrial Land (SILs) and Locally Significant Industrial Site (LSIS):** SILs and LSISs remain London's core industrial land reserves, safeguarded through planning policy to support logistics, manufacturing, and increasingly, digital infrastructure. As the economy pivots toward tech and data services, demand for modern industrial uses like data centres has surged, leading to clusters of new or proposed data centres on SIL or SIL-adjacent land across multiple boroughs.

Spatial decisions made by network operators, infrastructure providers, and authorities have responded to historical forces and evolving needs for resilience, efficiency, and connectivity. Over time, a network of distinct spatial clusters has emerged, especially the now-established **Availability Zones** and **Cloud Zones.** These clusters remain the primary locations for new data centre development and reflect customer requirements for high availability and fault tolerance. By grouping facilities into zones that are geographically separate yet interconnected, operators achieve greater resilience against local failures while maintaining low-latency connectivity and operational efficiency. Understanding the foundations of these clusters is key, both for interpreting London's current digital geography and for anticipating how it may evolve in the future.

Cloud Zones (CZ): Clusters of proximate data centres, often operated by multiple providers, and interconnected via dedicated dark fibre rings or private wavelength services. These high-capacity links enable low-latency communication, seamless load balancing, data replication and rapid failover. CZs share infrastructure for cooling, power and security. In London, prominent CZs include Isle of Dogs, West London (Hayes & Hillingdon), and the Enfield–Hertfordshire corridor.

Availability Zones (AZ): Physically separate data centre sites within a single cloud-provider region, such as AWS, Microsoft Azure, or Google Cloud, designed to deliver high resilience (tier 3 and 4), fault tolerance, and low-latency performance[32-34]. Each AZ is engineered to be far enough apart to avoid shared points of failure like grid faults or flooding and to be close enough to maintain sub-millisecond connectivity. In London, all three major cloud providers, AWS (eu-west-2), Microsoft Azure (UK South), and Google Cloud (europe-west2), operate regions with three AZs each, distributed across the London metropolitan area. While exact addresses are not disclosed for security reasons, official provider documentation confirm that these AZs are located within the London metro area, and likely within the Greater London boundary.

Appendix 2C provides a detailed overview of how electricity and fibre infrastructure influence data centre tier classification, along with their key technical requirements.

Current distribution of existing data centres across London's boroughs

Understanding the established footprint of data centres across London's boroughs.

London's operational data centre landscape shows an east-west distribution with a clear **spatial bias towards West and Central London**, a **notable cluster in Tower Hamlets**, home to the historic Isle of Dogs cluster, and around **Heathrow airport**. These locations reflect the legacy of early telecom infrastructure, financial services demand, and latency-driven site selection. As of November 2025, **99 operational data centres** have been identified across Greater London. The **concentration north of the River Thames** stems from historical forces outlined previously.

Historically, London's larger data centres typically **operated below ~30 MW**, with many smaller facilities under 10 MW. This pattern reflects earlier development priorities, enterprise colocation, latency-sensitive services, and the constraints of dense urban environments. However, limited publicly reported capacity data reduces the granularity of insights that can be drawn from this metric alone. Later sections of this report explore a notable recent shift in electrical demand. Today, the spatial distribution of data centres across London reveals a blend of established clusters and emerging development zones:

- **Hillingdon** hosts several large-scale facilities, including the Virtus campus at Stockley Park, comprising of 3 operational data centres with a combined capacity of 72.5 MW.
- **Tower Hamlets** includes a range of data centre sizes, with facilities exceeding 10 MW.
- **Ealing** has seen concentrated activity in the Park Royal area, which serves as a focal point for larger data centre developments.
- **Hounslow** presents a mixed profile, with both large and smaller-scale data centres. Its location along the M4 corridor supports connectivity and infrastructure access.
- **Hackney and Islington** are characterised by smaller-scale facilities, typically under 10 MW. These sites are often retrofitted into existing commercial or industrial buildings
- **Barking and Dagenham** currently hosts a single large facility with a capacity of 32 MW, which is expected to expand to 64 MW.

Appendix 2F provides a breakdown of operational and planned data centres by borough.

Figure 1: Count of operational data centres by local authority (September 2025)

Data Source: Planning London Datahub, London Heat Map and DataCentreMap data. For labelling purposes, City of London is abbreviated as CoL.

Spatial clustering in existing data centres

Four distinct data centre clusters follow an east-west axis, shaped by planning policy, infrastructure access, and land availability.

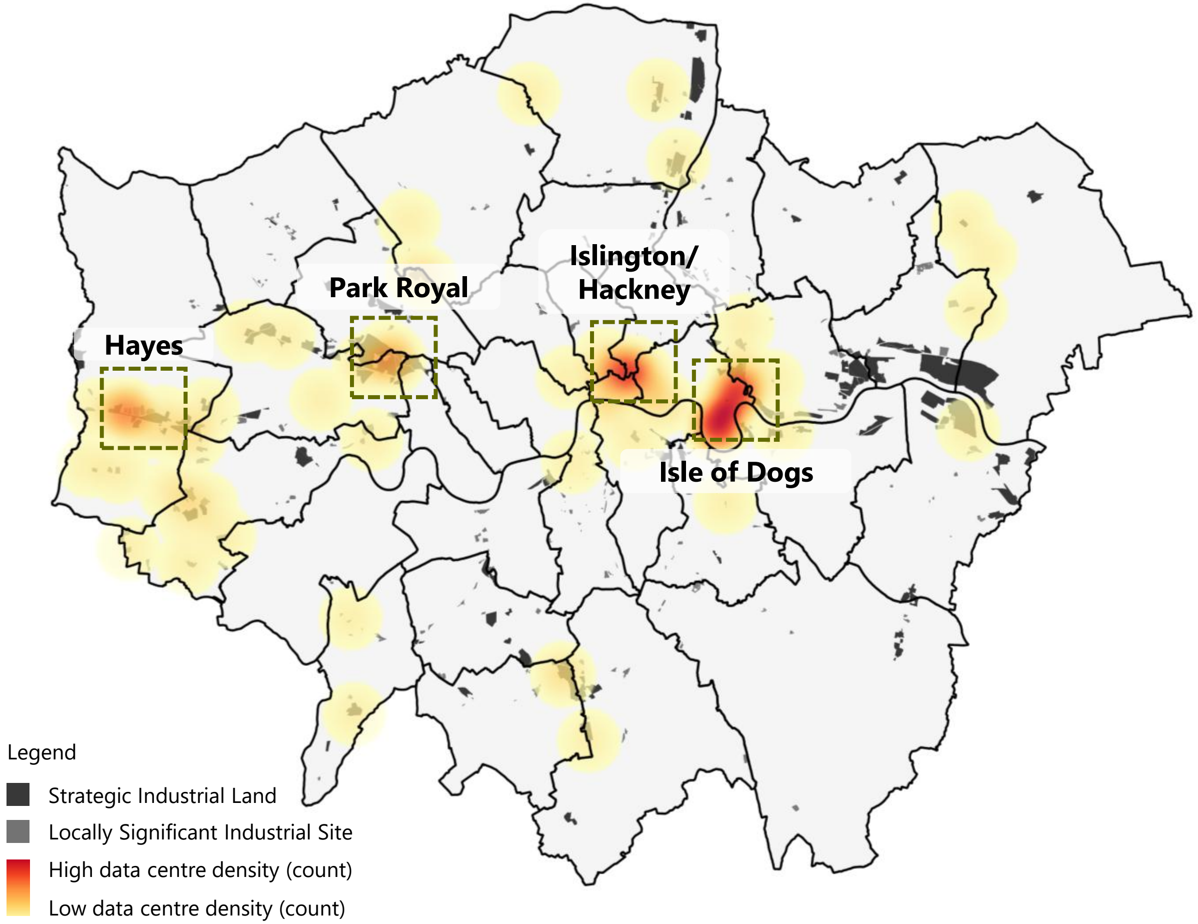
Analysis of current data centre locations across London reveals **four clear clusters**, forming east-west corridor of digital infrastructure with major concentrations in the Isle of Dogs area of East London. These clusters have emerged in response to a combination of historical development patterns, planning policy, infrastructure availability, and market demand.

The **inner London clusters** (e.g. Isle of Dogs, Islington/Hackney) are characterised by smaller-scale facilities, often located in retrofitted commercial buildings. These reflect legacy urban development and limited land availability.

The **outer clusters,** including Park Royal and Hayes in the west, and Enfield in the north, support larger, campus-style developments. These are enabled by greater land availability, proximity to industrial zones, and access to strategic infrastructure such as power and fibre networks.

These Western, newer clusters, **broadly align with areas designated as Strategic Industrial Land (SIL).** These areas offer suitable conditions for data centre development due to their zoning, infrastructure, and land use protections.

Figure 2: London's existing data centre clusters



Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

Spatial clustering existing outside the Greater London boundary

Data centre clusters from Isle of Dogs to Slough align with fibre backbones, subsea cable access, and dedicated power infrastructure

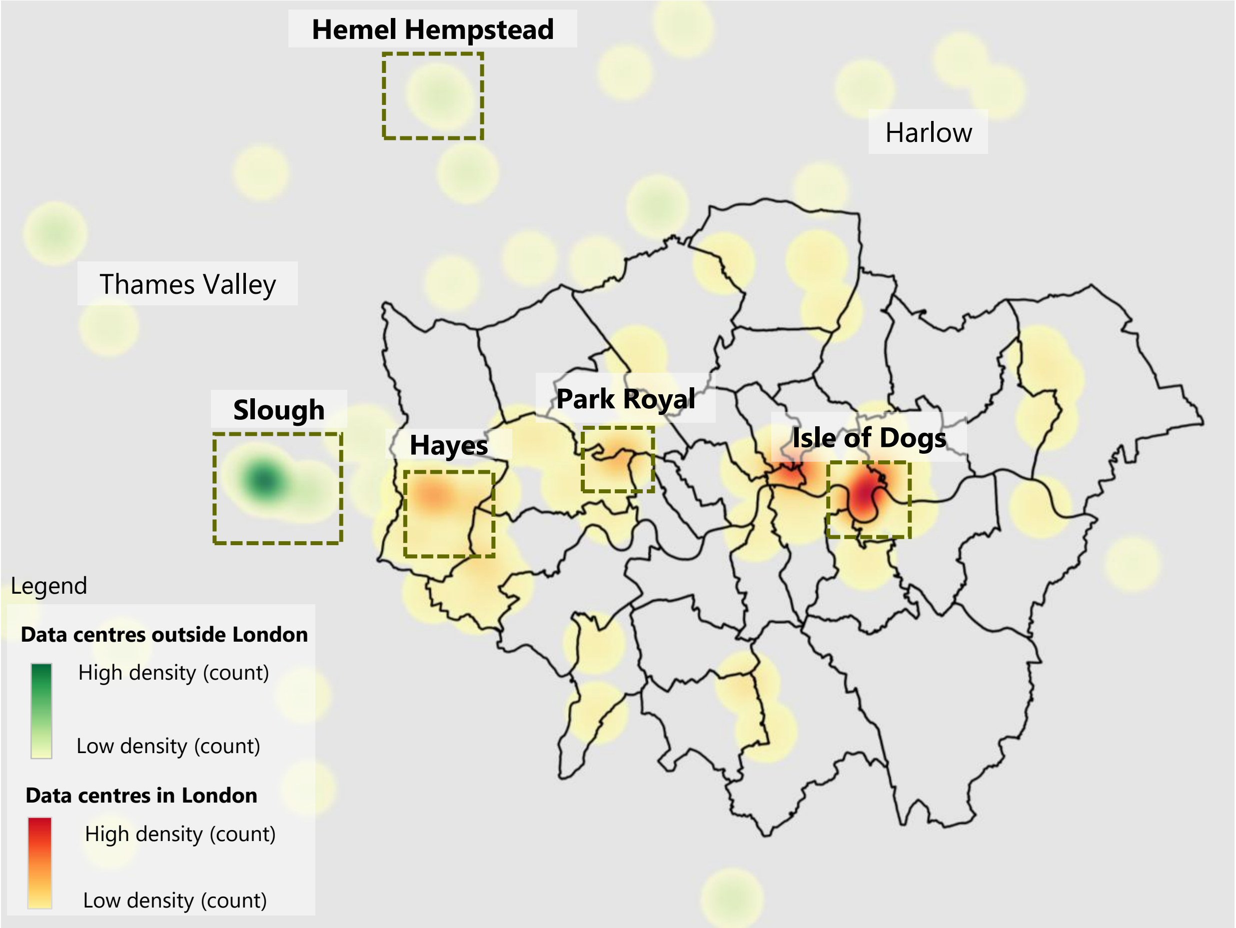
As noted, London's data centre landscape exhibits a **distinctive east-west corridor pattern.** This extends further west into the Slough/M4 corridor in West London, as evidenced by datacentremap.com's comprehensive facility listings, showing 177 data centres across the metropolitan area. This geographic distribution developed around several key data centre clusters with **Slough** and **Hemel Hempstead** outside Greater London, all evolving over the past three decades in response to critical infrastructure and connectivity needs.

The eastern hub emerged around Telehouse and the London Internet Exchange (LINX), leveraging direct access to subsea cables like Atlantic Crossing 1 and the West African Cable System. In contrast, the western corridor developed along the Bath Road (A4/M4), with Slough becoming a key node for transatlantic connectivity due to its proximity to the main fibre backbone. The east-west digital corridor leverages diverse fibre pathways from Cornwall's subsea landing stations to London, ensuring resilient connectivity between Isle of Dogs and emerging western hubs. Dedicated power infrastructure, including the Iver substation and multiple grid connections, further supports this network.

Just beyond the Greater London Authority boundary, other notable development continues in areas like Hemel Hempstead, Harlow and across Thames Valley. These locations offer lower land costs and robust infrastructure links, making them attractive alternatives for hyperscale and wholesale operators unable to secure space within London's limits.

These clusters outside the Greater London Area, particularly Slough, are expected to grow and can influence London's energy network through shared Grid Supply Points (GSPs). These shared nodes create interdependencies that may constrain available capacity or require reinforcement to maintain reliability. This impact is explored in greater detail in the subsequent energy section.

Figure 3: Existing data centre clusters across Greater London and surrounding London area



Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

Spatial clustering in existing data centres: West London

Park Royal and Hayes emerge as major nodes, hosting 16 operational facilities combined.

Park Royal is a significant data centre cluster within West London, characterised by a relatively high concentration of large-scale facilities. The area benefits from a combination of factors that make it particularly suitable for power-intensive digital infrastructure. These include the availability of industrial land, much of which is designated as Strategic Industrial Land (SIL), robust electrical grid connectivity, and proximity to major fibre routes. This cluster intersects with the **Old Oak and Park Royal Development Corporation (OPDC)** area and spans the borough boundaries of **Ealing and Brent**.

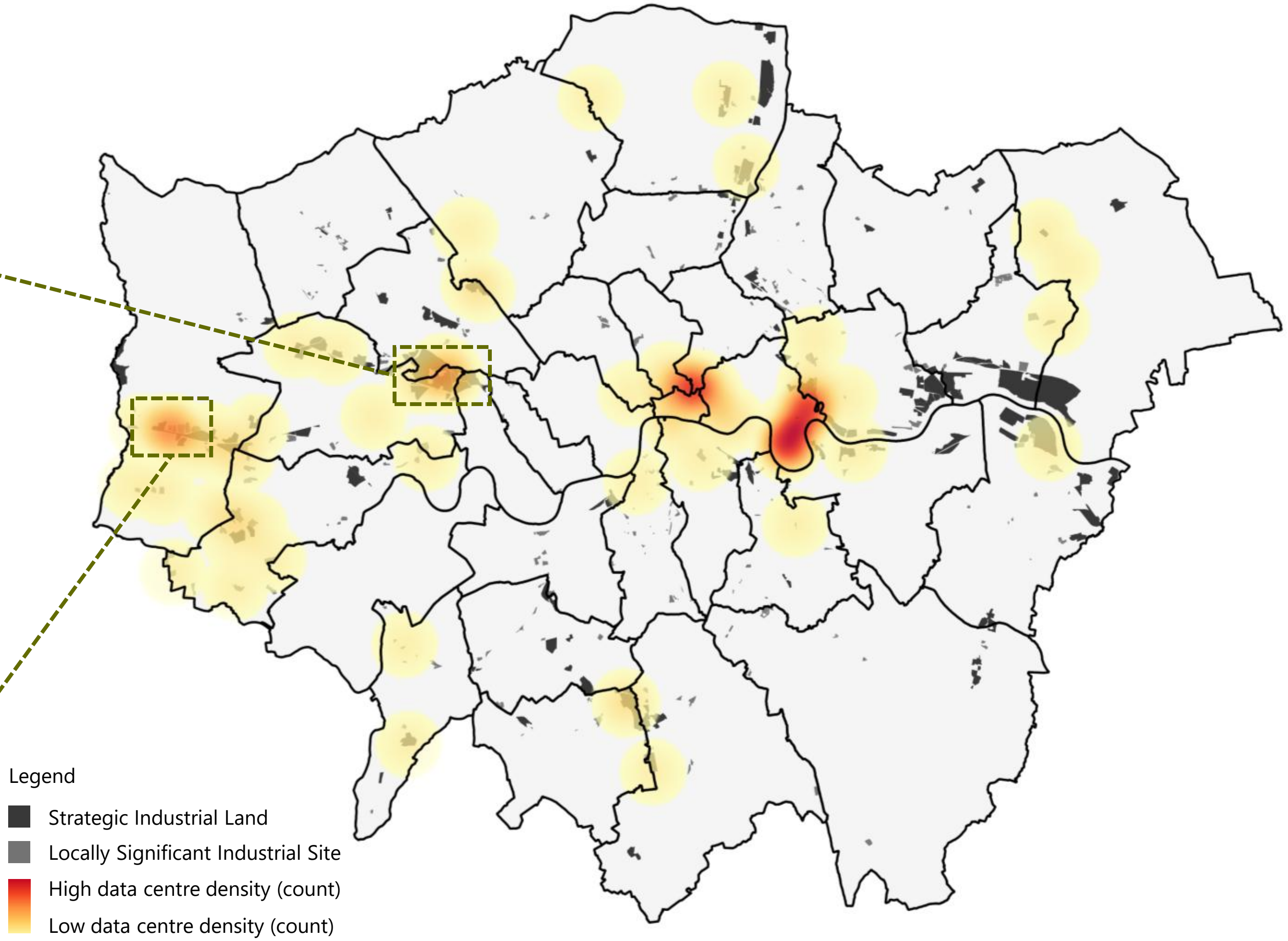
Its strategic location near key transport corridors and logistics hubs further enhances its attractiveness for operators seeking scalable, high-capacity sites. The presence of existing industrial uses and planning protections also supports long-term viability for data centre development in the area.

Number of operational data centres within the cluster: 7

Hayes, located in the London Borough of Hillingdon in West London, represents a notable data centre cluster. Its emergence as a hub for digital infrastructure has been shaped by key locational advantages, particularly its proximity to Heathrow Airport, strong electrical grid capacity, and existing fibre connectivity. These factors have contributed to Hayes developing as a distinct node within the broader east-west corridor of data centre activity.

Number of operational data centres within the cluster: 9

Figure 4: West London's existing data centre clusters

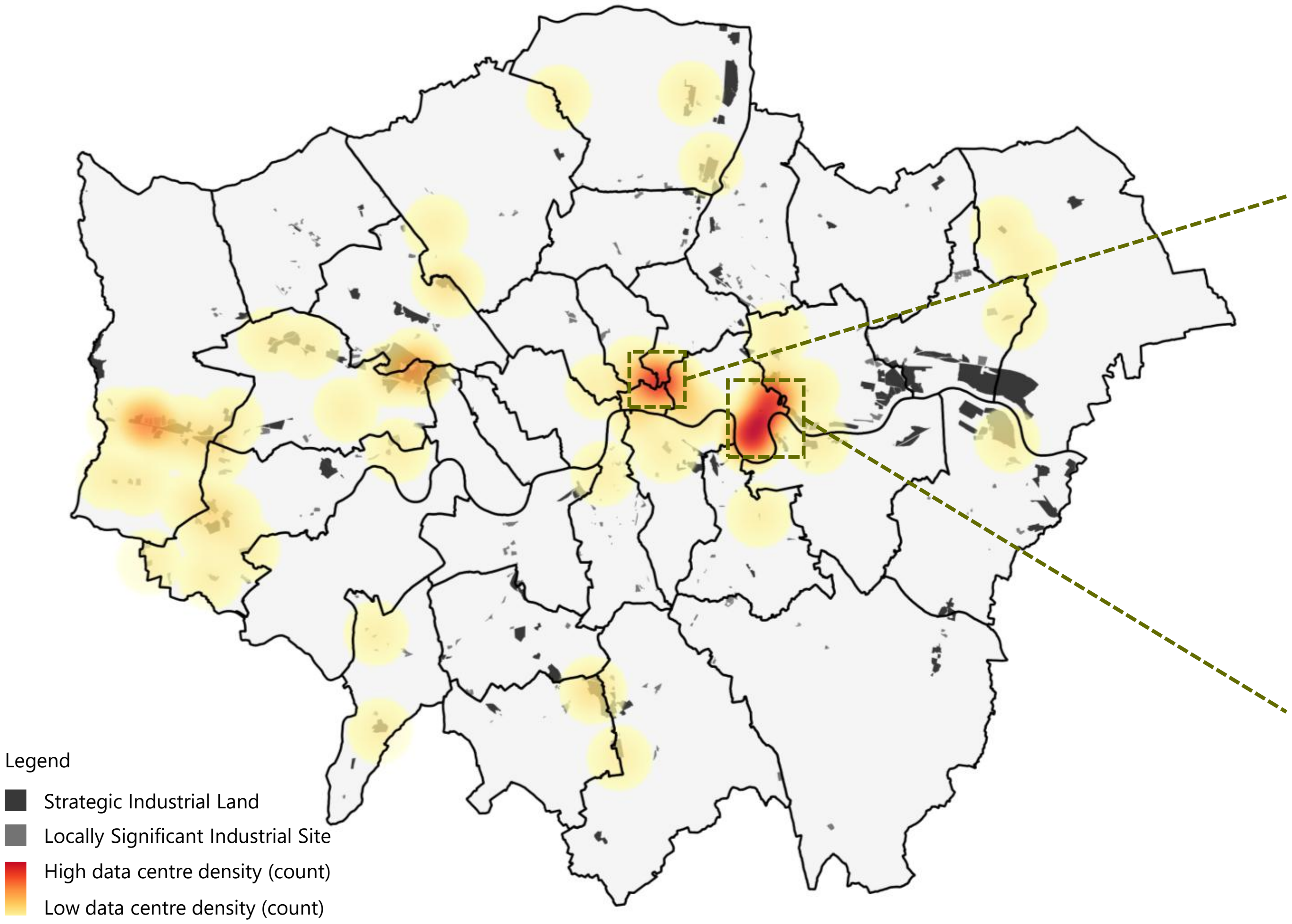


Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

Spatial clustering in existing data centres: Central and East London

Islington/Hackney cluster and Isle of Dogs are major nodes, hosting 33 sites combined and driving London’s digital backbone.

Figure 5: East London’s existing data centre clusters



Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

The central areas of **Islington and Hackney** host a high density of small-scale data centres, forming a compact urban cluster within Inner London. This area, including the boroughs of City of London, Islington, and Hackney, is increasingly referred to as ‘Silicon Roundabout’ due to its concentration of tech activity and digital infrastructure. The facilities in this cluster are typically located in retrofitted commercial buildings, office basements, or light industrial units.

This pattern reflects earlier waves of development focused on enterprise colocation and low-latency connectivity, catering to businesses requiring proximity to central London and fast access to financial and commercial networks. Unlike outer clusters, these sites tend to operate within constrained urban environments and outside designated Strategic Industrial Land (SIL), highlighting a different trajectory of growth shaped by demand for centralised, high-connectivity locations.

Number of operational data centres within the cluster 9

The **Isle of Dogs**, located in the London Borough of Tower Hamlets, represents one of the most densely concentrated data centre zones in London. The area hosts a mix of large-scale colocation facilities and smaller enterprise or edge sites, forming a diverse and strategically important cluster within Inner London supporting the financial sector.

Its significance stems from its early role in the development of London’s digital infrastructure, particularly its proximity to transatlantic cable landing points and its status as a major telecom interconnection hub. These factors have historically attracted operators seeking low-latency connectivity and access to global networks.

Similarly, the Isle of Dogs is not situated within designated Strategic Industrial Land (SIL), but its legacy infrastructure and connectivity advantages continue to support ongoing data centre activity in a dense urban environment.

Number of operational data centres within the cluster: 24

Planned data centre developments

London's next wave of data centres is expanding outward but planning visibility remains limited.

As digital demand accelerates and infrastructure requirements grow, a new wave of data centres is planned for London. As of September 2025, **26 future facilities have been identified across Greater London**, ranging from submitted planning applications awaiting determination and/or recently approved schemes. This map represents the current pipeline of data centre planning applications. Planning is typically required at least four years ahead of an energy connection. Additional pipeline developments, such as those currently in electricity connection queues, are not shown here, as they have not yet progressed to the planning application stage. A notable emerging proposal is the **London Data Freeport in East Havering,** which is progressing through alternative mechanisms such as a Local Development Order (LDO). This has been included on the map.

These sites reflect an outward shift toward boroughs with available industrial land, substation capacity, and planning environments more conducive to large-format development. Areas such as **Hillingdon, Ealing, Tower Hamlets** and **Newham** are emerging as key growth zones, supported by proximity to energy corridors and logistics infrastructure.

Hillingdon stands out as both the second-largest borough by existing data centre count and the most active in terms of planning activity. Tower Hamlets, meanwhile, has the highest current number of data centres and the second-highest count of planning applications. Due to complexities in representing expansions of existing facilities, ongoing activity in Tower Hamlets may exceed the three new data centres shown on the map.

Appendix 2F provides a breakdown of operational and planned data centres by borough, including data source and confidence.

Figure 6: Count of planned data centres by local authority (September 2025)

Data Source: Planning London Datahub. For labelling purposes, City of London is abbreviated as CoL.

Emerging patterns in planned site location and development activity

Concentration of data centre growth in established clusters reinforces infrastructure corridors but intensifies grid and land constraints.

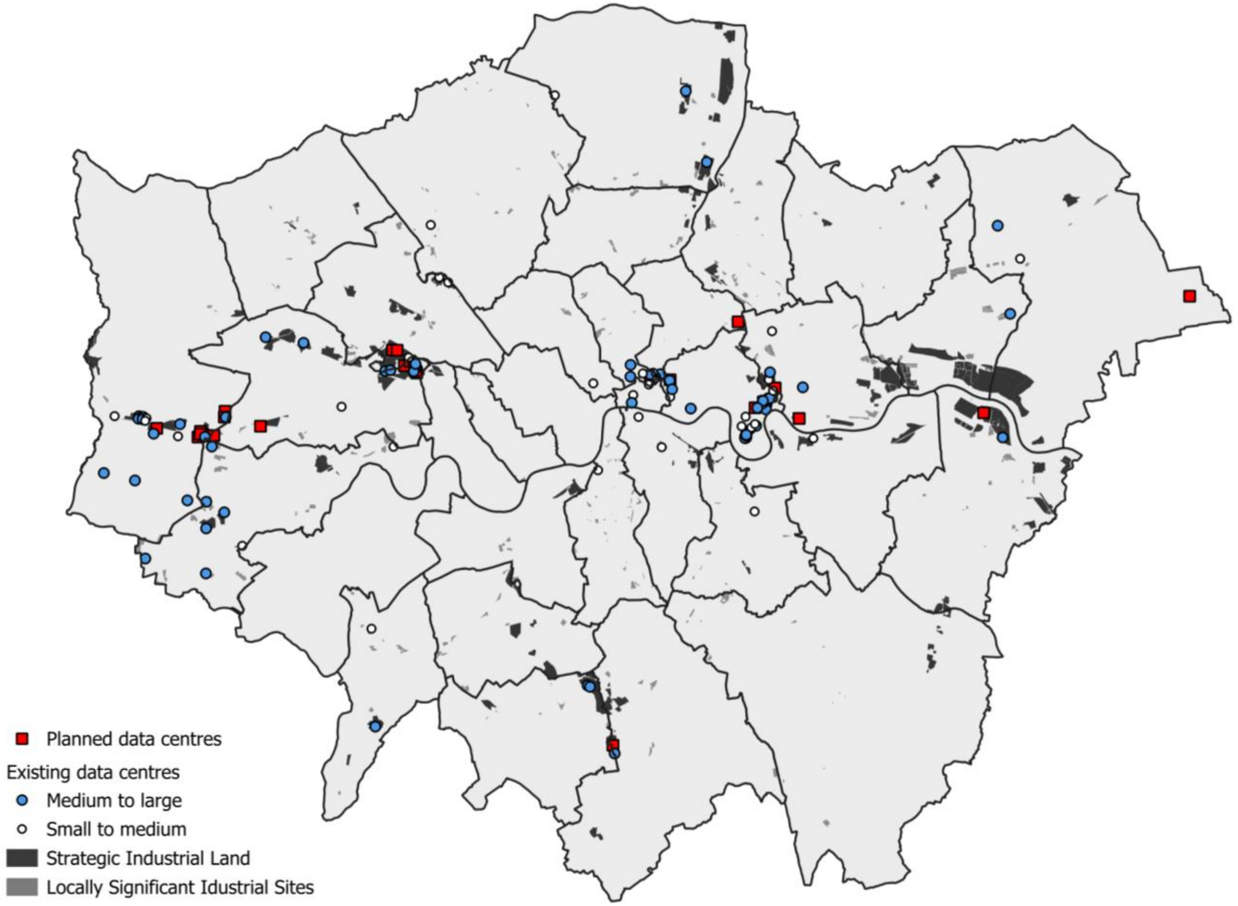
There is **strong continuity between existing and planned data centre locations**, with many new developments co-located alongside operational sites. This trend reinforces established infrastructure corridors and borough-level specialisms, reflecting developer preference for proven digital zones, areas with reliable grid access and fibre connectivity. Clusters in boroughs such as Tower Hamlets, Hillingdon, and Ealing exhibit both high operational density and a growing forward pipeline, indicating sustained confidence in these locations. However, the concentration of high-demand users further intensifies existing supply constraints, and the location of data centre development near borough boundaries means most areas of London are impacted.

Growth pressure is increasing around the fringes of strategic industrial land, particularly near Opportunity Areas. Southall Opportunity Area, identified in the London Plan, is emerging as a key pressure point. While no data centres are planned within its boundary, four new sites are located just outside it. In the Isle of Dogs, limited site availability is pushing growth eastward into the Royal Docks, which offer significant industrial land and development potential. This reflects a broader pattern of clustering along outer boundaries of SIL, where proximity to grid infrastructure and arterial roads, especially in outer West and North London, provides more viable planning pathways and fewer land constraints. These trends highlight the need for integrated planning between boroughs, infrastructure providers, and the GLA, as explored in Section 8.

Despite overall growth, there is still **limited activity outside of existing clusters**, both in terms of current and future development. This continues to reflect challenges around land availability, infrastructure access, and historic investment bias. Boroughs like Croydon and Merton remain underrepresented despite suitable industrial land, indicating a slower uptake and underutilised potential in the south.

Note is made on the map of '**medium to large'** and '**small to medium'** data centres. This is only qualitative classification based on a number of factors including visual inspection of satellite imagery, as capacity data is very sparsely available. However, as a rough indication, small to medium would indicatively be <3 MW and medium to large >3MW.

Figure 7: Location of both existing and planned data centres



Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

West London: Notable data centre locations and projects

Park Royal and Hayes drive new growth, with South London clusters gaining traction.

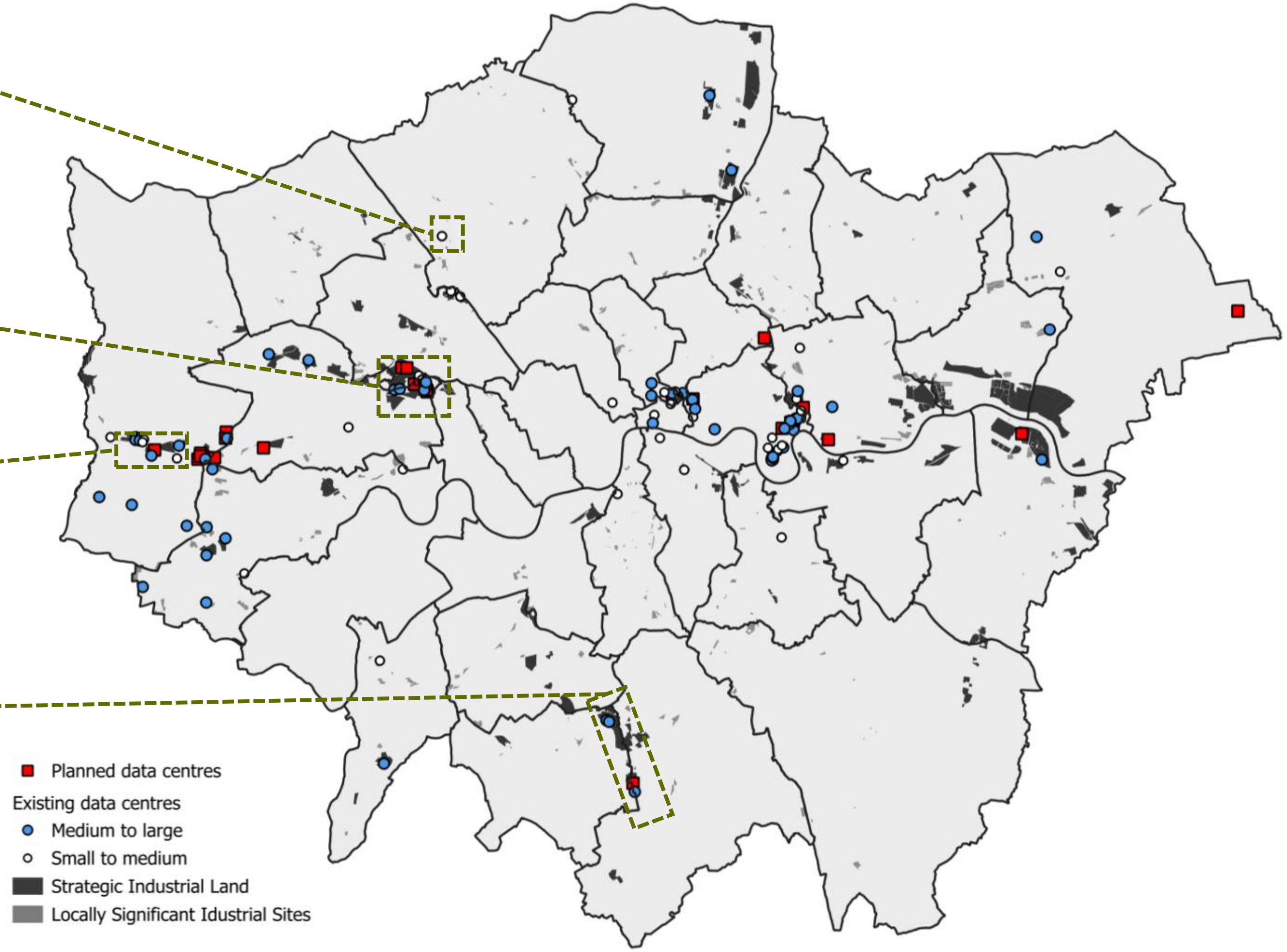
Barnet's only existing data centre is set to be **decommissioned**. While a relatively small site, it serves as a reminder that not all data centres are retained, and local infrastructure can evolve or contract depending on strategic priorities.

A **£1 billion hyperscale data centre in Park Royal** has submitted a planning application, developed by SEGRO and Pure Data Centres[32]. The approximately 56MW 30,000 sq/m facility is designed to support next generation AI and cloud workloads. While other large-scale projects are in the planning pipeline, Park Royals stands out with its hyperscale pre-led strategy.

The Hayes Industrial Area, designated as Strategic Industrial Land, currently has five data centres in planning and two additional sites just beyond its boundary, this includes a now permitted scheme for a 256MW data centre campus, highlighting its emergence as a key cluster for digital infrastructure development in West London. This is further explored in Section 6.

A corridor of relatively large data centres is emerging along the **boundary between Croydon and Sutton**, signalling an emerging development trend in South London. The area benefits from a combination of industrial land availability, strong energy infrastructure, and transport connectivity, making it an increasingly attractive location for data centre investment.

Figure 8: Location of both existing and planned data centres

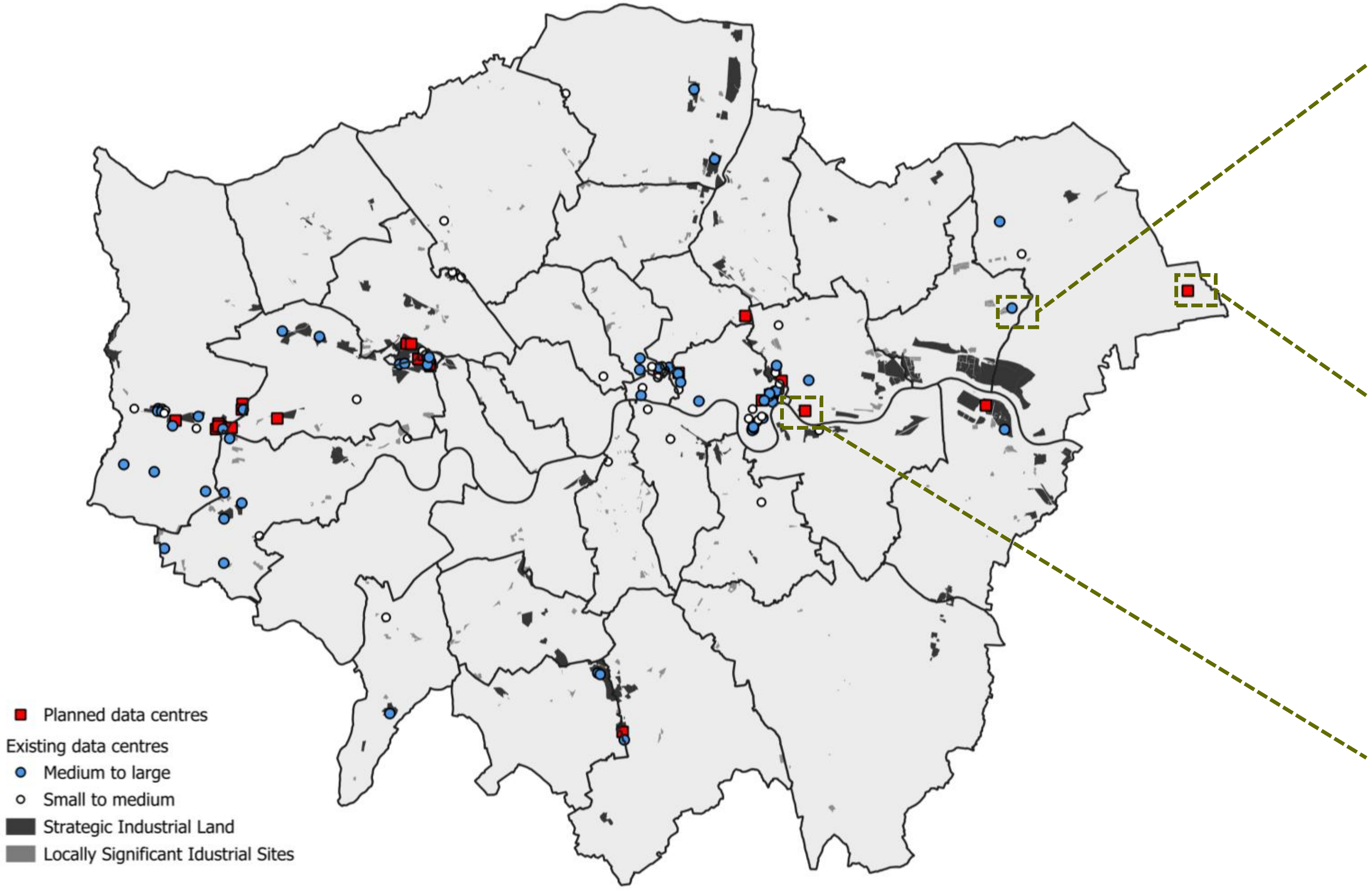


Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

East London: Notable data centre locations and projects

Major projects in Barking, Havering, and Newham signal hyperscale growth and strategic investment.

Figure 9: Location of both existing and planned data centres



Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

One site in **Barking and Dagenham** stands out for its scale. With currently 32 MW and a **planned full capacity of 64 MW**, it ranks among the largest data centres currently in London[36]. The development is part of the borough's broader strategy to attract high-value digital infrastructure, supported by its industrial land availability and proximity to energy networks. This site represents a significant asset in London's growing data centre landscape.

The proposed Data Freeport in East Havering is a large-scale hyperscale development with initial plans for **600 MVA of data centre** capacity, positioning it among the UK's most significant future data infrastructure projects[37]. The campus is expected to span over **250,000–400,000 m² of floor space**, allowing for multiple phases and modular expansion to accommodate evolving technologies such as AI and high-density compute. The site benefits from proximity to the Warley grid substation, which includes a 99 MW / 198 MWh battery storage facility, providing resilience and flexibility in energy supply.

A ~**210 MW** data centre is currently **under construction in Newham,** an increasingly common size for London, The site sits on **designated Strategic Industrial Land** and is located near the borough boundary with Tower Hamlets, positioning it to benefit from strong transport links and proximity to emerging digital districts around the Royal Docks and Stratford[38]. This development aligns with Newham's broader ambition, outlined in its Newham Sparks initiative, to become a leading hub for data-driven industries and infrastructure[39].

Summary of findings: Spatial patterns in London’s data centre network

A synthesis of key spatial and infrastructural characteristics shaping London’s existing data centre distribution and cluster formation.

Evolution of London's data centre network	London’s data centre infrastructure has developed over several distinct phases, beginning with telecom interconnection facilities and progressing to cloud-scale and AI-era campuses in recent years. Each phase reflects **technological advances and shifting service demands** that have influenced where and how facilities are built.
Concentration along an east-west corridor	London’s data centres are predominantly **distributed along an east-west axis**, connecting areas such as the Isle of Dogs, Park Royal and Hillingdon. This corridor aligns with major fibre and electricity routes, demonstrating a consistent relationship between physical infrastructure availability and location choice. It also reflects key demand centres such as Canary Wharf and the City of London.
Spatial clustering is prominent	**Several major clusters have formed along this axis**, each with specific attributes. Inner-city clusters like Islington–Hackney and the Isle of Dogs are composed mainly of smaller, retrofitted facilities suited to dense urban conditions, while outer clusters such as Hayes and Park Royal are characterised by large-scale, purpose-built facilities. While outside the Greater London boundary, Slough is also a key area of growth which has acted as an anchor for growth within London as well.
Data centres have not been prevalent outside of existing key clusters to date	Development remains uneven across the metropolitan area, with **fewer operational and planned sites outside of existing key clusters** This reflects patterns of infrastructure distribution and site availability observed over multiple decades. The persistence of this trend highlights a distinct geographic pattern although there are now some applications coming forward south of the river which may signal a change in this trend.
Implications for future growth	Although newer data centres are appearing in areas such as Havering and Bexley, most spatial and infrastructural evidence suggests that **growth will continue to cluster around corridors with established connectivity in identified Availability and Cloud Zones**. The location of future developments is primarily influenced by technical feasibility, site availability and condition, and access to network and energy infrastructure.

Section 3

National and regional policy landscape

This section presents an evaluation of policy landscape at both national and local levels within four critical domains, including water, energy, planning and land use, and digital infrastructure. It outlines the current status of policy development and implementation within each domain. It also considers the degree of alignment between national strategies and regional practices for London, providing a balanced overview of how policies are evolving across different governance levels.

The emerging policy landscape for data centres

As digital infrastructure becomes increasingly central to economic growth, national security, and technological innovation, data centres are now recognised as critical national infrastructure. In response, UK Government and industry stakeholders are further shaping policy to support sustainable, resilient, and scalable development.

The data centre spatial analysis set out in the previous section of this report provides insights into the historical factors that have shaped the distribution and growth of data centre infrastructure across London. Data centre supply in London reflects a complex interplay of factors, including access to utilities and land, user demand, technological evolution, and shifting service expectations, alongside constraints imposed by infrastructure and planning systems. These insights indicate that data centres have become increasingly embedded within London's urban and economic fabric.

Conditions shaping future data centre expansion are dynamic, influenced by emerging policy priorities, regulatory developments, and the designation of data centres as part of the UK's Critical National Infrastructure (CNI).

While the long-term implications are still unfolding, there is increasing evidence of a more coordinated approach between government and industry. Initiatives such as the updated National Planning Policy Framework, the CNI designation, proposals to include certain projects under the Nationally Significant Infrastructure Projects regime, the AI Opportunities Action Plan, and the Connections Action Plan highlight frameworks that aim to balance sustainability, resilience, and digital advancement.

The policy and regulatory environment is evolving, with implications for the pace, scale, and character of future data centre growth. As priorities shift across key domains, there is likely to be an impact on how data centres are planned and delivered. Continued observation of these developments will be important to understanding how the balance of priorities may change, and how London's infrastructure planning adapts in response to digital demand and broader economic and environmental considerations.

Policy Domain	What it covers
Land Use & Planning	This domain covers spatial planning policies and land availability. It outlines where data centres can be located, how they interact with surrounding land uses, and the planning processes required for approval and development.
Energy	This domain encompasses energy supply, grid capacity, carbon emissions, and alignment with decarbonisation targets. It includes policies on energy efficiency, renewable energy integration, and carbon reporting, all of which influence the operational sustainability of data centres.
Water	Water policy relates to the sourcing, usage, and environmental management of water resources. For data centres, this includes considerations around cooling technologies, water efficiency, and the impact on local water systems, particularly in areas facing water stress or supply constraints.
Digital Infrastructure	Digital infrastructure policy addresses connectivity, security, network resilience, and integration with broader digital strategies. It includes standards for fibre access, latency, and interoperability, ensuring that data centres can support the growing demands of cloud computing, AI, and real-time digital services.

An overview of the UK policy landscape for data centres

Reviewing strategic policy domains and how aligned regulations can enable sustainable, resilient, and scalable growth of the UK's data centre ecosystem.

Land Use and Planning

Planning policy is undergoing significant reform to better integrate data centres into strategic land use frameworks. The 2024 Revised National Planning Policy Framework (NPPF) states that planning policies should pay particular regard to identifying suitable locations for uses such as data centres.

The Towards a New London Plan consultation 2025 recognises that data centres play a vital role in London's economy but also bring significant challenges, and benefit from a more strategic approach to better coordinating locations for them in the future[40].

The Bill 2024 has signalled its intention to extend the **Nationally Significant Infrastructure Projects (NSIP)** regime to include data centres, streamlining consent via Development Consent Orders (DCOs)[41]. This will take effect once secondary regulations confirm capacity thresholds and commencement dates.

Meanwhile, the AI Growth Zones identify five strategic regions for accelerated data centre development, establish minimum capacity and energy thresholds, and integrates site selection with regional grid resilience, connectivity, and economic growth plans to unlock up to £100 billion in private investment[42].

Energy

Ofgem's TMO4+ reform, introduces a "first ready and needed, first connected" approach for transmission-level generation and storage[43]. Projects must show land rights planning progress **("readiness")** and align with Clean Power 2030 **("needed")** to secure a connection. Demand projects are automatically considered "needed" and bypass these criteria, though Ofgem is developing demand-side reforms. A November 2025 update from Ofgem highlights data centres as a key driver in demand connection applications, highlighting the need to distinguish viable projects to protect grid capacity and prioritise strategic developments[44].

Clean Power 2030 is the UK's plan for a fully decarbonised electricity system by 2030, focusing on low-carbon generation, storage, and supporting infrastructure[45].

National Grid's **RIIO-ET3** price control commits £35 billion to transmission upgrades, integrating renewables and addressing system constraints[46].

NESO's Regional Strategic Energy Plans are being developed to inform network planning by aligning new grid capacity with projected development pipelines, while the GLA is bringing forward **Local Area Energy Plans to reflect local priorities on growth and decarbonisation**[47].

Water

Water policy is becoming central to data centre planning and operation amid growing resource constraints. Water is used for data centre cooling; however, cooling technology and sources are constantly evolving, including non-water-based technologies.

The Water Industry Act 1991 **does not require water utilities to supply to non-domestic** users (including data centres) and makes **trade effluent consent** mandatory for non-domestic wastewater discharge to public sewers[48]. However, the designation of data centres as Critical National Infrastructure (CNI) has increased the pressure on water utilities to supply key development[48,8].

Abstraction licenses and discharge licenses are managed separately by the Environment Agency[49,50]. This is particularly relevant for data centres with water-based cooling systems, which may require both types of licensing depending on their operational needs.

National Framework for Water Resources, **encourages the use of alternative cooling technologies and non-potable water sources**, however, these recommendations are **not yet reflected in legislation**[51]. It notes that work is underway to develop sustainability policies for data centres, therefore policy may emerge.

Digital Infrastructure

Data centres were designated as **Critical National Infrastructure** in September 2024, reshaping policy frameworks to prioritise compute capacity, national resilience, and AI capability development[8].

The Future of Compute Review, AI Opportunities Action Plan (2025), and Invest 2035, the UK's Modern Industrial Strategy, establish **strategic governance for forecasting compute demand, managing data protocols,** and **ensuring operational resilience**, while the Blueprint for Modern Digital Government sets updated priorities for infrastructure and public sector transformation[7,52,53].

Invest 2035 **reinforces digital infrastructure as a national growth pillar**, promoting co-location incentives, grid reform, and long-term planning certainty. Sovereign AI initiatives aim to secure domestic compute capacity for mission-driven public sector use[54].

The forthcoming Cyber Security and Resilience Bill will mandate security-by-design standards and incident reporting for CNI-designated facilities[55].

Future policy is expected to focus on fibre access, latency standards, interoperability, and closer alignment with regional strategies.

Appendix 3 contains a comprehensive review of all policy domains as of November 2025.

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Section 4

Market dynamics influencing data centre growth

Section 4 examines the strategic forces shaping the UK and London's data centre landscape, including emerging demand drivers such as AI workloads. It also explores critical supply-side constraints, from energy availability and planning to fibre connectivity and land access, alongside the evolving policy and regulatory environment influencing infrastructure delivery and investment decisions. It also explores trends across data centre typologies to anticipate future capacity requirements in response to these demand and supply dynamics.

Demand drivers and supply constraints for data centre growth in London

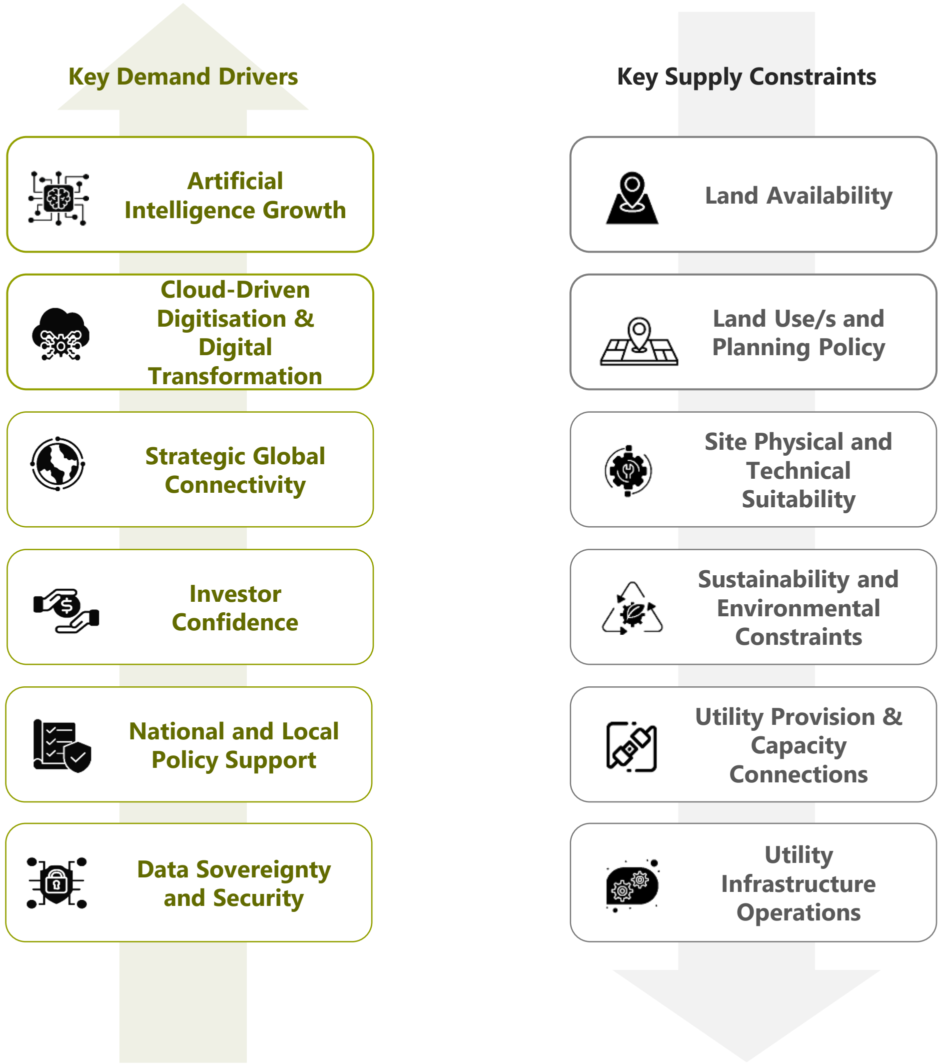
London's data centre growth is shaped by powerful demand factors and increasing supply constraints that together influence the scale and location of new developments.

This section examines the dual forces shaping London's data-centre landscape: the **demand drivers fuelling growth** and the **supply constraints that increasingly dictate where facilities can locate and operate**.

London's data centre market is being reshaped by a convergence of powerful demand drivers, including **exponential growth in AI workloads**, rapid cloud adoption, and strategic global connectivity. The UK Compute Roadmap 2025 forecasts a national requirement of **at least 6GW of AI-capable infrastructure by 2030**, triple the current estimated capacity of 2GW[11]. supported by over **£31 billion in infrastructure investment** and national initiatives like AI Growth Zones. London's leadership within the FLAP-D cluster, combined with its extensive peering networks, subsea cable infrastructure, and thriving AI ecosystem, further amplifies this momentum.

On the supply side, constraints are intensifying around access to electricity, water, fibre, and suitable land, each governed by distinct authorities and regulatory processes. The UK's electricity grid is experiencing pressure, with Energy Networks Association stating a significant increase[56]. Ofgem's November 2025 update identifies **data centres as a major driver of this surge** in the demand queue (from 41 GW in November 2024 to **125 GW in June 2025**)[56,44], noting that many projects in the queue are stalled or speculative[44]. In response, Ofgem and NESO are shifting from a "first-come, first-served" model to a "first-ready, first-connected" approach, aiming to prioritise viable and strategically important developments.

The **interplay of demand drivers and supply constraints** are the factors which are influencing development patterns, pushing hyperscale campuses beyond Greater London and catalysing the emergence of colocation clusters in certain boroughs. The analysis that follows explores these dynamics in more detail and introduces how they will influence the scale, speed, and spatial distribution of London's next-generation data centre infrastructure.



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Demand drivers for data centre development in London

How AI proliferation, policy acceleration, and global connectivity converge to drive unprecedented data centre demand in London

Artificial Intelligence Growth

According to the UK Compute Roadmap, the nation's **data centre capacity should at least triple to 6 GW of AI-capable capacity by 2030** to meet rising demand from AI-driven workloads, reflecting an unprecedented shift in both the scale and specialisation of infrastructure. The roadmap makes clear that demand could "exceed this baseline significantly" should AI adoption accelerate beyond current projections[11].

This is supported by policy frameworks, including the AI Opportunities Action Plan, the **designation of AI Growth Zones**, and over **£14 billion in announced digital infrastructure investments**[7]. London's position as Europe's largest data centre market within the FLAP-D cluster further amplifies this momentum[45].

London is expected to absorb a significant share of this growth, benefiting from its established data centre market and visible in ambitious projects like the London Data Centre Campus in East Havering. However, there remains uncertainty about how much of the most intensive AI training will ultimately reside in London, given the specific needs and infrastructure constraints.

Cloud-Driven Digitisation & Digital Transformation

Cloud adoption is accelerating digital transformation across London, driving demand for scalable, low-latency data centre infrastructure. As the UK's primary digital hub, London supports critical enterprise and public sector workloads. Ofcom and the Competition and Markets Authority (CMA) report that cloud services are now essential for UK businesses, with spending reaching **£10.5 billion in 2024** and **growing nearly 30% annually.** Public cloud dominates the market, while hybrid and multi-cloud strategies are widely adopted to boost resilience and compliance.

This transformation is strongly reinforced by comprehensive government strategies, with the UK Compute Roadmap (2025) prioritising domestic data processing and sovereign AI infrastructure[11].

London's position is further strengthened by the **presence of major cloud regions for AWS, Microsoft Azure, and Google Cloud**, anchoring the city's role as a global interconnection hub for enterprise and government workloads. These platforms enable critical services for financial institutions, healthcare providers, and universities.

Strategic Global Connectivity

London remains Europe's largest data centre market, anchored within the FLAP-D cluster (Frankfurt, London, Amsterdam, Paris, Dublin), which together account for over 60% of the continent's capacity[58].

The city's global connectivity is powered by infrastructure like the London Internet Exchange (LINX), which operates across 16 sites and recently hit a **peak traffic record of 10.8 Tbps**, connecting over **950 networks from more than 85 countries**. LINX also increased its network capacity by 21% in 2024, from 60.10 Tbps to 72.91 Tbps[59].

London's connectivity advantage is further strengthened by transatlantic subsea cables such as Aqua Comms' AEC-1 system, which spans 5,536km between New York and the UK, offering low-latency, high-capacity links critical for finance and cloud services. Google's Grace Hopper cable adds another layer of resilience, linking New York to Cornwall, and Spain, with a design capacity of 352 Tbps across 16 fibre pairs, one of the highest-capacity systems in operation. These assets make London a critical node for data centre workloads and global connectivity.

Demand drivers for data centre development in London

How AI proliferation, policy acceleration, and global connectivity converge to drive unprecedented data centre demand in London

Investor Confidence

London's appeal for data centre development was significantly boosted in October 2024, when the **UK Government announced £6.3 billion in new foreign investment** from four major US tech firms, CyrusOne, ServiceNow, CloudHQ, and CoreWeave, as part of its International Investment Summit. This brought total UK data centre investment to over £25 billion since July 2024[61].

The momentum may be further amplified by the proposed **UK-US Tech Prosperity Deal**, which may include over £31 billion in AI-related infrastructure investment, with Microsoft alone pledging £22 billion to build the UK's largest supercomputer and expand national AI capacity[62].

These developments signal a significant shift in the UK's technology strategy, pairing foreign direct investment with domestic policy initiatives such as AI Growth Zones and the £2 billion Compute Roadmap to deliver sovereign AI capacity and next-generation digital infrastructure. For London, this means intensified competition for land, power, and connectivity.

National and Local Policy Support

UK data centre development is **driven primarily at the national level**, with limited formal frameworks locally beyond ambitions in the London Growth Plan[1].

Recent policy reforms are reshaping how data centres access infrastructure and secure planning approvals. Key changes include the **designation of data centres as Critical National Infrastructure,** updates to the National Planning Policy Framework that asks planning policies to identify suitable locations for uses such as data centres, and the launch of AI Growth Zones[8,12]**.**

Continued collaboration between policy-makers, regulators, and industry will be essential to unlock further improvements for customers and ensure the UK remains globally competitive in digital infrastructure. This means moving beyond one-off reforms toward a **coordinated governance model that addresses systemic challenges and extends to innovation and resilience.** The UK Parliament Commons Library and industry bodies like TechUK are calling for integrated frameworks that link energy policy, land-use planning, and digital strategy to avoid bottlenecks that could constrain hyperscale and AI-ready developments[63].

Data Sovereignty and Security

Regulatory requirements such as the UK GDPR and sector-specific mandates in finance and public services are prompting organisations to host sensitive data within UK jurisdiction[64-66].

These frameworks ensure that personal and operational data is governed by UK law, enhancing compliance, transparency, and control. National ambitions for digital sovereignty are also accelerating demand for secure, domestically controlled infrastructure.

The UK Compute Roadmap (2025) outlines **plans for sovereign AI infrastructure**, including **ring-fenced compute capacity for sensitive workloads in defence, science, and public services**[11]. This strategic shift supports operational resilience and reduces reliance on foreign cloud providers, reinforcing the UK's leadership in secure digital infrastructure.

Land use and planning constraints shaping London's data centre landscape

Key constraints are shaping new data centre supply in London, where grid capacity, planning competition, sustainability demands, and connectivity are collectively determining the pace and location of future builds.

Land Availability

London's data centre development faces land constraints, driven by **intense competition from industrial/ logistic uses**, and a sustained decline in industrial floorspace, and a sustained decline in industrial land, down 18% city-wide between 2001 and 2020 (London Industrial Land Supply and Economy Study, 2020). Although the London Plan includes measures to protect industrial sites, industrial land **vacancy at just 3.9% across the city** (London Industrial Land Supply and Economy Study, 2020).

As a result, large-scale projects are increasingly moving outside the M25, where newly designated AI Growth Zones may provide more available land and infrastructure. This is explored further in section 5.

Land Use/s and Planning Policy

The revised National Planning Policy Framework (December 2024) now requires planning policies and decisions to pay regard to the need for data centre development, acknowledging their specific locational requirements and growing strategic importance within the UK's digital infrastructure landscape. Although statutory guidance sets a 13-week target for major developments, planning timelines for data centres can vary locally, especially where planning sensitivities such as scale, design considerations, or land use alignment come into play[68].

There remains **ambiguity in the relevant planning use classes for data centres**, with applications in London coming forward as Use Class B8 (storage and distribution) or Sui Generis. This is explored further in section 5.

Site Physical and Technical Suitability

Site viability is increasingly shaped by geotechnical and environmental constraints, with **flood risk assessments required for any site within zones of potential flooding**.

The Environment Agency and SEPA recommend **avoiding sites with a 1-in-1000 year flood probability for critical infrastructure**, and mandate robust modelling and mitigation strategies[69]. Planning documents for data centres in London show a need for large floor areas to house data halls and essential equipment like substations and cooling infrastructure. Analysis shows that average figures for total internal floor area reach 23,000 sqm and a site area of 26,000 sqm. This requirement for unobstructed space often results in the ruling out of smaller industrial sites. This is explored further in section 5.

Sustainability & Environmental Constraints

Data centres are subject to growing environmental scrutiny, requiring detailed assessments of energy, water, biodiversity, and carbon impacts. **Environmental Impact Assessments (EIAs)** are **mandatory for large or sensitive sites under the Town and Country Planning (Environmental Impact Assessment)** Regulations 2017, which aim to ensure developments with significant environmental effects are properly evaluated.

In the case of data centres, this often includes scrutiny of air quality impacts from diesel backup generators, high water usage for cooling, and limited biodiversity net gain. This is explored further in section 5.

Utility supply constraints shaping London's data centre landscape

Key constraints are shaping new data centre supply in London, where grid capacity, planning competition, sustainability demands, and connectivity are collectively determining the pace and location of future builds.

Utility Provision & Capacity Connections

Electricity capacity is the primary bottleneck for data centre expansion in London, particularly in west London hubs like Hillingdon and Ealing**.** These areas face demand levels of 100+ MW, but limited substation headroom is triggering delays of **5 to 10 years for new grid connections**, according to Energy Uk and CBRE[71,72].

To meet rising demand, accelerating delivery of critical infrastructure will require strategic investment in network capacity aligned with spatial energy plans, supported by regulatory funding mechanisms that enable building ahead of confirmed demand. In response to these constraints, operators may begin considering on-site gas generation as a temporary workaround to bypass electricity grid limitations. By contrast, water and fibre requirements are typically less constrained, making them easier to secure in most cases. This is explored further in Section 6.

In November 2025, **UK Power Networks has become the first Distribution Network Operator (DNO) in the UK to join the Data Centre Alliance (DCA) as a strategic partner**[73]. This partnership aims to strengthen engagement with the data centre sector and support faster, more flexible grid connections, helping the UK position itself as a global hub for AI, cloud services, and advanced computing.

Utility Infrastructure Operations

Beyond securing initial utility connections, London data centre operators face persistent infrastructure challenges across power, water, and fibre that influence both design and operational strategies.

Electricity resilience is critical, as grid constraints and surging AI-driven demand push operators toward robust redundancy measures. This includes widespread adoption of **N+1 UPS systems, on-site generation, and battery storage** to maintain uptime and mitigate risks from delayed grid reinforcements[74]. These strategies are increasingly seen as essential for hyperscale facilities where even short outages can have significant financial and reputational impacts.

Water consumption is another major consideration. A 100MW hyperscale data centre in the UK can **consume up to 2.5 billion litres** of water annually, equivalent to the needs of approximately 80,000 people, driving the shift toward closed-loop, air, and liquid-immersion systems to reduce reliance on potable water[75].

Fibre connectivity remains strong, but the complexity of AI workloads and the need for ultra-low latency are reshaping network design. Operators increasingly **deploy dual-entry, carrier-neutral meet-me rooms and low-latency backhaul** to support AI workloads and mitigate single points of failure. This is explored further in section 6[76].

A summary of the predicted shift in data centre typologies

Supply and demand dynamics for data centres are expected to reshape traditional formats and while these categories remain useful, the lines between them are increasingly blurred as operators adapt to changing digital infrastructure needs. However, market transparency remains limited, and many insights are still anecdotal.

	Current	**Emerging** (5 – 10 years)	**Prediction** (10 – 25 years)
Edge	Accounts for a small but notable share of London’s capacity, primarily serving **telecoms, fintech**, and **IoT applications**. Edge sites typically require less than 1 MW and are often located in repurposed exchanges or fibre vaults, close to end-users and transit infrastructure.	Specialised, smaller sites located at transport hubs, exchanges, or fibre-rich suburban nodes support **latency-sensitive applications, 5G,** and **real-time data processing for smart city solutions** and fintech.	Edge data centres (<5 MW) will continue to grow with connectivity expansion in UK policy. **City-wide, networked mesh of edge nodes** will enable automated services, and resilient urban tech ecosystems[78]. Expected to support decentralized AI inference and digital public service platforms.
Enterprise	Legacy data centre typologies, historically common in finance, government, and large corporations, **are shrinking rapidly**, remaining relevant primarily in regulated or highly secure sectors.	**Accelerated migration to cloud and colocation is underway,** with some hybrid deployments combining enterprise racks within managed colocation suites to meet compliance requirements.	On-premise enterprise typologies will continue to shrink, replaced almost entirely by hybrid cloud-colocation models except for certain finance and public sector legacy needs. London’s enterprise share may fall below 5%, leaving **only “last mile” high-security installations.**
Colocation	**Colocation is London’s prevailing model and may account for up to** 80% of London's facilities, according to Mordor intelligence[58]. These range from retail suites serving SMEs to wholesale racks for larger corporates and tech firms in the Isle of Dogs and West London.	A growing shift towards wholesale colocation data centres due to rapidly increasing power demands and scalability needs**.** Operators are increasingly adopting **modular, AI-ready suites and Tier IV resilience** zones to support cloud migration and public sector digital sovereignty[77].	**Future colocation typologies will blur with hyperscale** in mega-complexes, with growth in multi-hall “district” campuses containing direct grid and cooling links. **Driven by emerging workloads and sovereign cloud demand.**
Hyperscale	Hyperscale development within Greater London has been limited by land constraints, grid power availability, and operator preferences. As a result, most **capacity is concentrated in areas like Slough**, just outside the GLA boundary.	**A surge in strategic large projects in London**, including Ada Infrastructure Royal Docks (200+ MW), Digital Reef Havering campus (600 MW), SEGRO/Pure DC Park Royal (56 MW) headline projects.	Hyperscale data centres in the London area will continue to see a steady rise, but growth is **concentrated in campus-style developments** on **sites near or at the Greater London boundary.**

Compute-driven growth: Why data centres are denser, not smaller

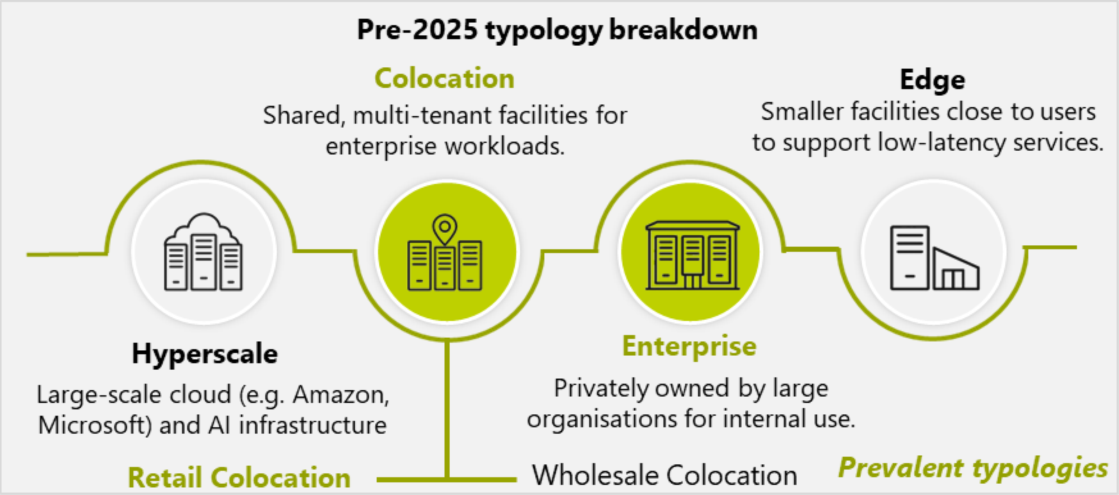
Rising power densities, new site demands, and shifting designs are expected to reshape London's data centre landscape.

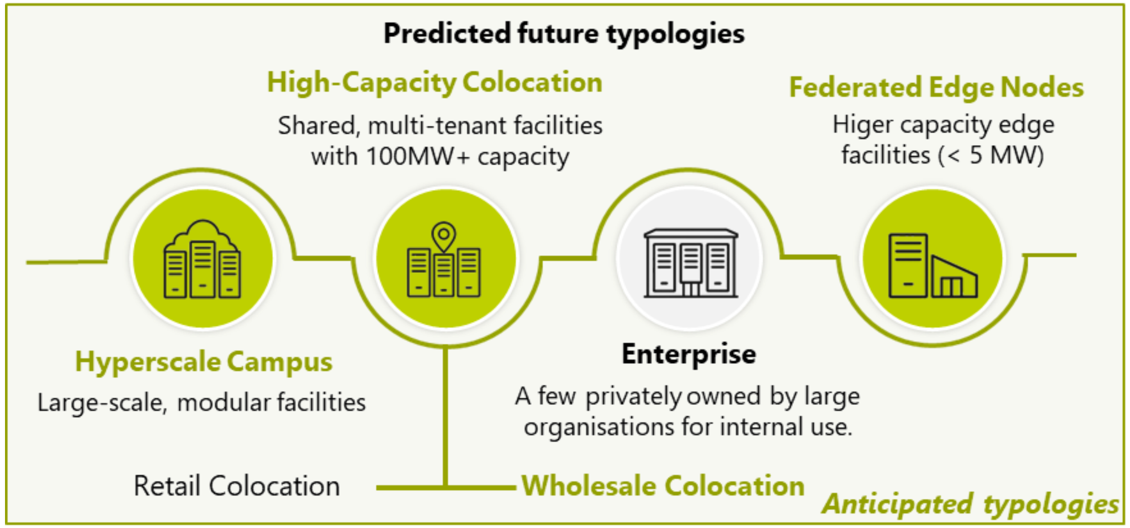
As cloud and AI adoption accelerates, the nature of data centres are evolving. Data centres are shifting from storage-centric to compute-intensive environments, especially in support of AI and high-performance workloads. This transition is driving a steep increase in rack power densities, rising from historical averages of 6-12kW per rack to 40kW, 60kW, or even higher in next-generation facilities. At the same time, emerging workloads such as artificial intelligence (AI) and machine learning (ML) are inherently variable and demand high levels of redundancy, resilience, and upgradability.

This increase in density does not necessarily reduce overall building or land requirements. While IT equipment grows more powerful, and in some cases more compact, layouts are evolving to provide greater spacing for cooling and flexibility for future needs. Evidence from planning data in Section 3 and direct engagement with operators suggests that demand for large, flexible sites will remain strong, particularly in London. Operators are prioritising facilities that can accommodate future expansions, retrofits, and advanced cooling technologies, compliance with evolving environmental, safety, and maintenance standards. This evolution is reshaping data centre typologies:

- Colocation centres are moving beyond their original role of shared tenancy for moderate workloads, becoming high-capacity wholesale environments that can support dense compute and sovereign workloads.
- Edge data centres, are evolving into more powerful and autonomous facilities, increasingly capable of handling AI inference and decentralised processing at scale.
- Hyperscale campuses are emerging as a dominant model, offering modular expansion, and the flexibility to adapt to future technology shifts.

To meet these requirements, operators are prioritising developments that offer scalable land options and "power-first" infrastructure i.e. sites where electricity connection offers are secured before planning or construction begins. This trend is especially evident in areas like Hayes and Park Royal, where new data centres are clustering on industrial land and expanding outward.





How power, cooling, and space are reshaping the design of data centres

From rack-level heat to multi-storey builds, next-gen data centres prioritise power, flexibility, and resilience over footprint efficiency.

Rising rack power density and cooling: Server racks in modern data centres are becoming smaller yet far more power-dense, resulting in increased heat output and necessitating advanced cooling technologies such as liquid cooling and rear-door heat exchangers (RDHx). Although these technologies can reduce server inlet temperatures and improve energy efficiency, their deployment often **offsets any theoretical gains in floor space** due to the need for physical access, maintenance zones, and compliance with evolving safety and environmental standards. According to ASHRAE guidelines, the recommended rack intake temperature range is 18–27°C, with allowable excursions up to 32°C for certain equipment classes[79]. Operators must balance performance and cooling cost trade-offs, with higher intake temperatures can reduce cooling energy use but may degrade compute performance or hardware lifespan. This dynamic introduces a level of uncertainty when attempting to correlate power demand with a specific physical footprint, particularly in high-density environments.

New compute demands are reshaping typologies: As power demand rises due to evolving workloads, energy availability becomes a key constraint. Larger data centres are increasingly tied to existing grid connections, prompting larger developments in select, power-rich zones and emerging in the clusters identified in Section 3. Operators are not incentivised to shrink their land or building footprints materially. Instead, flexibility, resilience, and access to scalable power continue to outweigh pure square-metre efficiency gains. Despite exponential growth in rack density, the physical scale of new data centres, at both building and campus levels, is expected to remain constant or even increase. The next generation of high-density, AI-driven facilities will optimise for power and cooling distribution, not land minimisation, at least for the foreseeable future. **This is further explored in Section 6, where the National Grid Connection Queue demonstrates that 76% of data centre connection applications in the London area are planning capacity over 100 MW.**

Retrofitting is limited: This evolution in design has major implications for retrofitting older buildings. Warehouses and legacy commercial properties, once common conversion targets, now struggle to meet the structural, spatial, and utility demands of modern high-density data centres. Retrofitting often requires extensive upgrades to power, cooling, and fire safety systems, making it costly and inefficient. Industry feedback consistently highlights that most legacy buildings lack the capacity to support today's compute-intensive workloads. As a result, the market is shifting decisively toward bespoke developments, each tailored to meet the specialised typologies and operational needs of next-generation infrastructure, particularly for colocation and hyperscale facilities.

Multi-storey data centres as a response to land scarcity: The need for large square footage, coupled with the scarcity of suitable sites for data centres, is making multi-storey designs increasingly attractive in dense urban areas. A notable example is the approval of two data centres in Newham, both of which have received planning consent for buildings up to 65 metres in height, equivalent to approximately 12–15 storeys, depending on internal layout and plant requirements. These facilities offer higher rack density per footprint but introduce complex cooling challenges. The roof of a data centre plays a critical role in heat rejection, and taller buildings limit available roof space for cooling plant deployment. To address this, developers are exploring external gantries, segregated airflow systems, and vertical plant stacking. These solutions require early-stage design coordination and compliance with standards BS EN 50600-2-1 and 2-3, which govern building construction and environmental control. Without careful planning, multi-storey facilities risk thermal inefficiencies and reduced operational capacity.

Summary of findings: Policy and market factors shaping the sector

A balanced overview of national and regional frameworks, market drivers, and infrastructure constraints influencing site selection, development patterns, and future capacity in London.

National policy and regulatory evolution	The key policy change to impact the sector is the inclusion of data centres within the National Planning Policy Framework. Recent changes to other national policy, including the designation of data centres as Critical National Infrastructure (CNI), AI Opportunities Action Plan and Industrial Strategy as well as proposed inclusion within the NSIP regime, and Ofgem's grid reforms under the Connections Action Plan, reflect **stronger national coordination to support sector growth**. These frameworks, together with the new Connections Accelerator, aim to improve grid efficiency and planning certainty. However, several elements remain under consultation, and their long-term effects on delivery and regulation are not yet fully understood.
Rising demand driven by AI and cloud	The sector's growth continues to be underpinned by **accelerating digitalisation, AI-driven computing, and widespread cloud adoption**, with both public and private **investment playing a key role**. London remains the UK's principal data centre hub due to its robust connectivity and role within global trade and financial networks, but this concentration is intensifying pressure on existing infrastructure.
Infrastructure availability as a precondition	**Electricity grid capacity is a primary constraint** for new development, with headroom limitations and multi-year connection queues in some boroughs, especially for large-scale or hyperscale projects. The November 2025 highlights that the volume of demand connection applications has surged far beyond even the most ambitious forecasts, driven largely by the growth of data centres. This surge is due to both credible data centre projects as well as less viable projects that may block progress for projects behind them in the queue. Ofgem states that the presence of unviable projects risks misallocating resources and creating inefficiency across the electricity system. To address this, Ofgem are considering options for reforms to the demand connections process. Water and fibre requirements are generally less restrictive, but cooling technology and licensing can still pose operational hurdles.
Scale and density are redefining data centre form	Sector trends show a rapid move from retrofitting older buildings to delivering **purpose-built, high-capacity campus data centres**, including the adoption of multi-storey formats in urban areas like Tower Hamlets, where land is limited. Many new facilities now employ modular layouts and flexible infrastructure to support evolving technical requirements and future expansion. These shifts reflect how **physical constraints, technological needs, and regulatory frameworks are increasingly intertwined** in shaping how and where London's data centres are delivered and operated.
Implications for future growth	As digital demand continues to rise, London's data centre market is expected to see further expansion in both scale and complexity. Future growth will **depend on the availability of suitable land, reliable power and fibre infrastructure**, and the ability to meet increasingly demanding technical requirements, such as higher power densities, advanced cooling systems, robust connectivity, and enhanced resilience to support next-generation digital workloads.

Section 5

Land use and planning considerations

This section examines the factors shaping land use and planning for data centre development in London. It focuses on urban land constraints, such as land use policies and competing priorities, alongside other factors affecting site feasibility and key decision points in the planning and approval process. The section also considers how policy changes and sustainability requirements, are influencing site selection and the pace of future development.

Land use and planning factors affecting data centres in London

Overview of spatial, regulatory, and infrastructure challenges shaping data centre development in London, with key planning factors influencing site selection and viability.

Data centre development across Greater London faces growing challenges due to scarce industrial land availability, intensifying site competition, policy gaps and regulatory ambiguity in this emerging sector. **Strategic Industrial Land (SIL)** and **Locally Significant Industrial Sites (LSIS)** available for new industrial development remains severely constrained, with 2020 **vacancy rates of just 3.9% London-wide and 1.4% in the West sub-region hubs,** including Park Royal, as outlined in the London Industrial Land Supply and Economy Study 2020[80]. Initial infrastructure advantages in these hubs have been eroded by overcrowding, creating severe grid constraints and soaring land values. East London and the outer boroughs offer more land but, in some instances, lack the electricity transmission network infrastructure and fibre infrastructure essential for large-scale operations.

Data centres may currently have greater relative economic viability compared with traditional warehouse and industrial uses, enabling them to compete more aggressively for limited sites across the GLA, where availability is scarce and competition is intense. Green Belt areas, including previously developed land within the Green Belt (referred to as “Grey Belt” sites), are being explored as alternatives by data centre developers. Planning use classifications for data centres currently vary across boroughs. Most data centres are considered Use Class B8 (Storage and Distribution), but some are treated as Sui Generis (of its own kind), creating inconsistency in change-of-use rights and policy applicability. Securing permission typically involves major planning applications that can take 18–24 months or longer. Many larger schemes, particularly those with co-location elements, also fall within the Mayor of London’s referral thresholds, introducing an additional layer of scrutiny. While the government has committed to enabling data centres to use the NSIP regime through forthcoming secondary legislation, current schemes must proceed through traditional planning routes.

Data centre specific planning policy can streamline the planning application process. Slough, a town 22 miles west of London, has adopted its **fourth Specialised Planning Zone (SPZ) scheme for the period 2023-2034**[81]. This policy allows specific infrastructure, including data centres, warehouses, and R&D centres, to be built without individual planning permissions, provided they meet defined conditions. The SPZ is accompanied by a Section 106 agreement, ensuring investment in infrastructure improvements, environmental protections, and community benefits such as public amenities and transport upgrades. SPZs enable rapid adaptation to market needs, with sustainability standards embedded in design codes. Slough’s 30-year history of SPZs has accelerated data centre development, offering certainty and flexibility to developers in meeting the fast-evolving demands of the digital economy. However, SPZs do not guarantee electricity network investment. Power capacity remains subject to separate network planning and investment and requires close collaboration to ensure supply meets demand.

Beyond policy, technical site suitability is critical. Sites need robust utility connections and adaptable plots. Flood risk, contamination, and poor access can render sites unviable. Sustainability policies on carbon, water, biodiversity and reusing heat are key factors for approval and may add further complexity.

With **industrial land declining by 18% since 2001** (Industrial Land Supply and Economy Study 2020) and demand rising, developers are turning to vertical intensification (e.g. stacking data halls above warehousing or R&D uses), cross-boundary site assembly, strategic co-location, and fringe Green Belt sites. This section of the report further explores each of these core factors shaping land use and planning supply for data centre development in London.

Understanding the interplay of policy, suitability & planning in site selection

Delivering data centres in London's competitive and highly regulated market means navigating three key factors: policy, site suitability, and planning approvals.

Unlike traditional industrial uses, data centres require significant utility capacity, a shift towards more bespoke building typologies, and proximity to key fibre network nodes, all within a highly competitive and spatially constrained market.

In this environment, **successful site selection and project delivery hinge on more than just available land.** Projects must navigate protected industrial designations, meet technical requirements, and evolving planning frameworks. This includes national policy in the NPPF, the London Plan, and individual borough Local Plans. These interdependencies are heightened by tightening sustainability mandates and mounting pressures on utility resources, raising the threshold for regulatory approval and operational viability.

Ultimately, site selection and delivery in London hinge on **three interconnected factors**: alignment with policy, physical and technical suitability, and different available routes to planning'.

As London's planning landscape grows more dynamic, the ability to balance these forces has never been more critical to attracting viable new data centre investment.

Policy and Land Use Compliance

This refers to the regulatory framework that indicate where development can occur, ensuring that proposed sites align with strategic and local land use priorities:

- SIL designation in the London Plan
- Use Case Classifications
- Spatial and geographical constraints

Site Availability & Suitability

This considers land available for development, and, critically, whether the physical and technical attributes of the site support the intended use

- Utility Connection
- Geotechnical and Environmental Factors
- Building and Operational Requirements

Planning Permission Pathways

Once a site is identified as available and suitable, and appears to align with planning policy, the next step is gaining formal permission.

- Standard Planning Routes
- Emerging NSIP Route
- Permitted Development Rights

Understanding patterns in land use across London’s data centres

Overview of the industrial land distribution of existing and planned data centres in London.

The spatial distribution of data centres across London’s industrial land correlates strongly with industrial land designation, especially as larger, modern facilities gravitate towards Strategic Industrial Land (SIL) and Locally Significant Industrial Sites (LSIS).

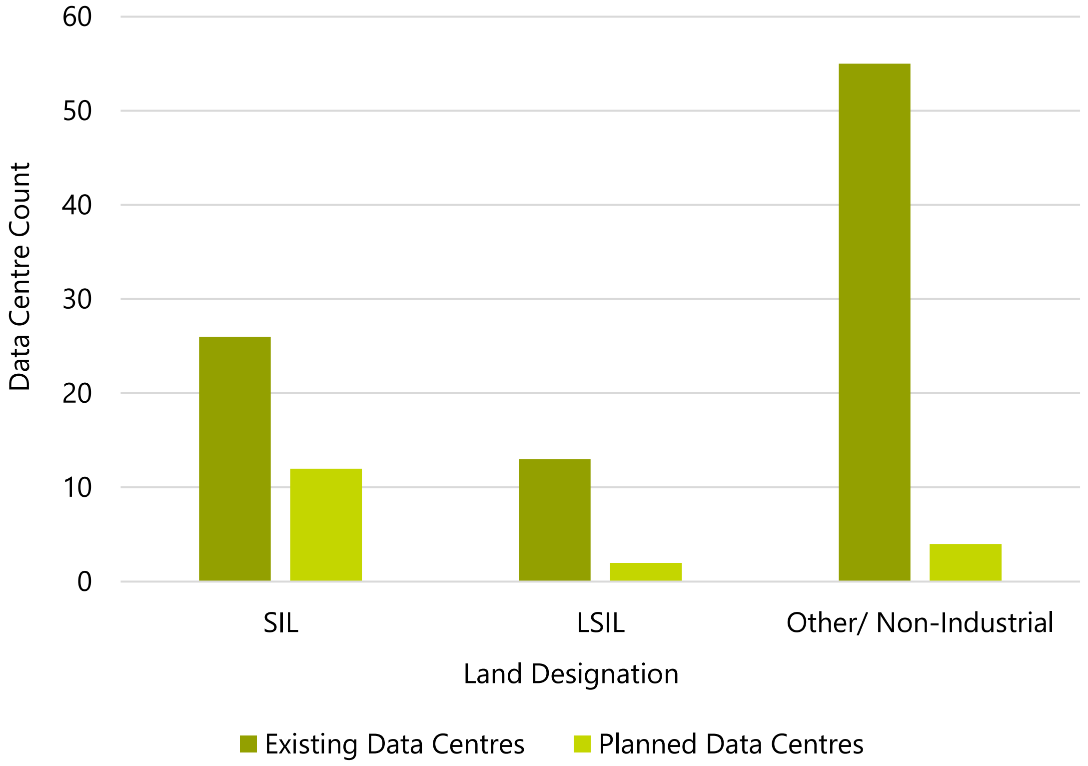
- **SIL:** Designated under the existing London Plan policies E4 and E6 to support London’s core industrial, logistics, and digital infrastructure.
- **LSIS:** Designated under London Plan policy E5 to safeguard key industrial sites for meeting borough-level industrial, logistics, and supply-chain needs.

Around 42% of existing data centres are sited within these designated zones, with significant clusters in West London, particularly Park Royal and Hayes, where infrastructure and energy access support new development and large-scale operations. By contrast, smaller, often legacy data centres remain scattered through East London and inner-city boroughs like Tower Hamlets, Islington, and Hackney, which are located outside formal industrial areas due to the limited availability of SIL/LSIL in these areas. These legacy sites inflate the count of non-industrial data centres and can obscure the recent trend toward consolidation of newer, high-capacity centres in designated industrial land.

Looking ahead, planned development overwhelmingly aligns with industrial land policy. Approximately **78% of proposed schemes (14 out of 18) are within SIL or LSIS**, with two additional sites just outside SIL boundaries in Hayes. Notably, around 40% of all planned data centres are concentrated in Hayes, forming a distinct West London cluster. This reflects strong market demand and strategic advantages such as proximity to high-capacity power and fibre networks. This shift is intensifying competition for industrial land, as data centres increasingly vie with other industrial uses, such as logistics, warehousing, and light manufacturing, for limited space in designated zones. This trend reinforces the strategic importance of West London’s industrial corridors.

In early 2025, three hyperscale data centres were approved on appeal in Green Belt outside of London. While no data centre development to date has come forward on Green Belt areas within London, this signals increasing interest from developers in exploring larger Green Belt sites for strategic data centre development opportunities.

Figure 10: Distribution of Data Centres Across Land Classifications*



*Data source: *Based on available data from the Planning London Datahub (October 2025)*

Planning use case classification ambiguity in data centre development

Despite precedent for B8 classification, inconsistent applications across boroughs and terminology create planning risk and uncertainty. This has raised the question of clearer guidance and potentially dedicated planning classifications.

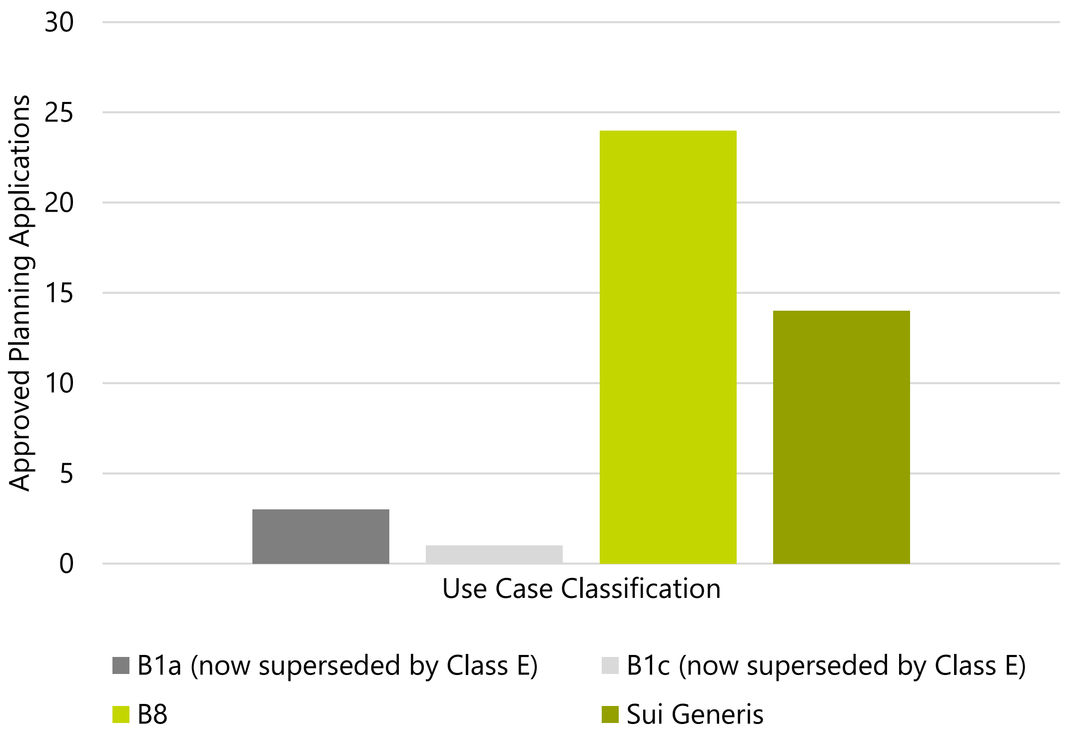
The default classification for data centres is typically Use Class B8 (Storage & Distribution), supported by precedent such as the 2009 Magna Park planning appeal (Appeal Ref: APP/Y0435/X/09/2103771), where the Planning Inspectorate confirmed that data centre use fell within Class B8 due to its core function of storing and distributing digital data[83]**.** However, the decision also acknowledges that some local authorities have opted for alternative classifications, such as Sui Generis, often citing atypical operations, energy use, and infrastructure needs, though these are not binding precedents at the national level.

Analysis of recent planning decisions from the Planning London Datahub, covering a **sample of 42 applications** dating back to 1998 which included information on use class within application descriptions, shows that 24 were classified as B8, 14 as Sui Generis, and the remainder under legacy B1 use classes.

This divergence reflects differing views by local authorities, often based on operational characteristics such as energy intensity, security, and infrastructure. While some applicants refer to "Use Class B8 (Data Centre)" in submissions, this phrasing is informal and not recognised in secondary legislation. The statutory Use Classes Order does not include this sub-category, and planning authorities must assess the nature of the use based on its characteristics, not applicant terminology. This can result in variation across boroughs, with some schemes classified as Sui Generis.

While B8 continues as the predominant approach, the unique characteristics of modern hyperscale data centres, may eventually necessitate dedicated planning classifications.

Figure 11: Use Case Classification of London Data Centres*



*Data source: *Based on available data from the Planning London Datahub*

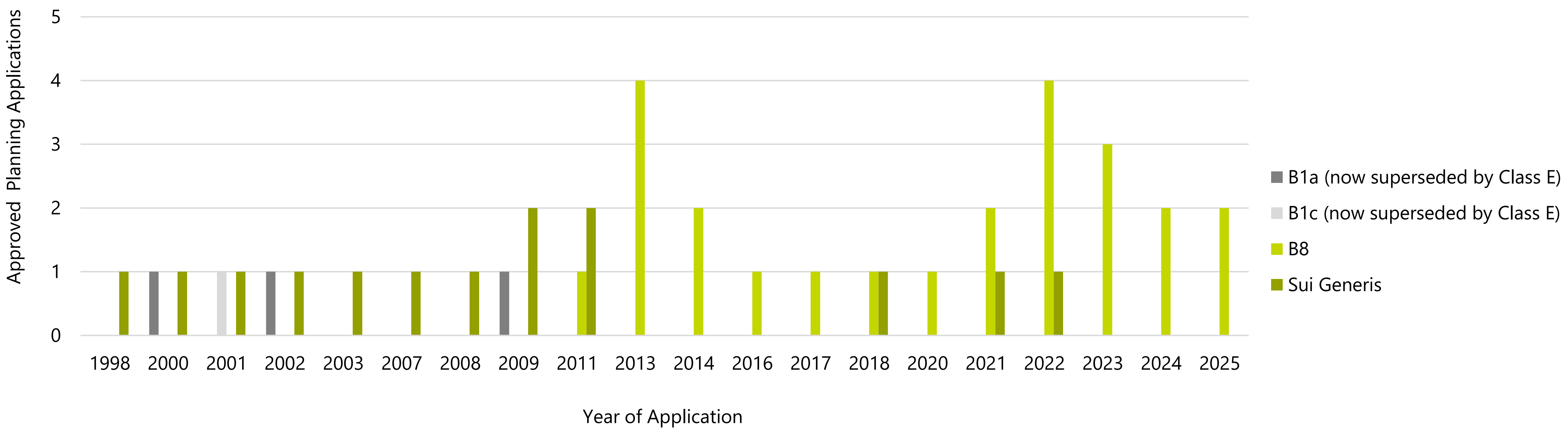
Use case classification trends in data centre planning applications

Tracking how data centre use case classifications have shifted in London planning policy over time in response to changing commercial, industrial, and data infrastructure needs

The graph below illustrates a more detailed view of the evolving distribution of data-related use case classifications in London planning policy over the past three decades. In the earlier periods, Class B1a (offices), B1c (light industrial), and Sui Generis categories were predominant, reflecting the traditional focus on business and specialist uses within urban development frameworks. However, as time progresses, there is a marked shift in classification trends.

Class B8 (storage and distribution) becomes increasingly prominent, particularly from the late 2000s onward. This transition aligns with broader economic and technological shifts, including the rise of e-commerce, logistics infrastructure, and data centre development and the 2009 Magna Park planning decision, which set a precedent for large-scale logistics and data infrastructure in Greater London. This decision catalysed a re-evaluation of land use priorities, paving the way for more flexible and utility-driven classifications.

Figure 12: Time Series of Use Case Classification of London Data Centres*



*Data source: *Based on available data from the Planning London Datahub*

Planning policy considerations for data centres

Securing planning consent for a London data centre entails multiple parallel processes, each with its own statutory periods, engagement requirements and potential extensions.

In 2024, planning policy for data centres in London is being fundamentally reshaped by new national and city-level priorities. The UK Government has recognised data centres as essential digital infrastructure, and the updated National Planning Policy Framework (NPPF) requires planning policies to facilitate development that meets the needs of a modern economy, including identifying suitable locations for uses such as data centres and other digital infrastructure.

The most significant policy development is the forthcoming Nationally Significant Infrastructure Project (NSIP) regime. Under this framework, large and strategically critical data centres will be **eligible for determination by the Secretary of State via the Planning Inspectorate**, with local planning authorities and the Mayor of London as statutory consultees. Despite this regime, most data centre growth in London is expected to continue through the **established borough planning process**, with a significant proportion of major applications “referable” to the Mayor.

Other notable 2025 policy changes, such as the designation of data centres as Critical National Infrastructure (CNI) and the introduction of AI Growth Zones, reinforce the national priority now attached to digital infrastructure but have **minimal practical effect on planning in London**. CNI status primarily ensures enhanced operational and security support in emergencies, **without providing any special planning advantages or accelerated approvals**, while AI Growth Zones are targeted at regional sites with major grid availability, making direct benefit for London unlikely. Despite the more supportive national context, the real determinants for data centre growth in London remain local, including policy engagement with boroughs, Mayoral referral processes, and navigation of evolving regulatory reform continue to shape the pace and scale of new development.

Application and Consent Routes

Standard Major Application (Borough-Determined)

- Full planning application is submitted to the relevant borough, including technical and environmental studies.
- Applications are “referable” to the Mayor if they exceed certain thresholds such as 30 metres in height or involve more than 15,000m² of floorspace, which triggers Greater London Authority (GLA) review for strategic conformity.
- An Environmental Impact Assessment (EIA) is required for large-scale data centres
- Statutory determination period is 13 weeks, but in practice, an end-to-end process typically takes 18–24 months.

Nationally Significant Infrastructure Project (NSIP) Route

- The NSIP regime is expected to be expanded (early 2026) to cover the largest and most nationally significant data centres[84].
- Applications proceed directly to the Secretary of State and the Planning Inspectorate
- This route usually involves extensive pre-application consultation, up to six months of public examination, and a typical end-to-end process lasting 2–4 years.
- While the NSIP route may take longer overall, it is designed to provide greater certainty and strategic alignment for nationally critical infrastructure. Further detail on how data centre applications will be considered under NSIP is expected in a forthcoming National Policy Statement.

Permitted Development Rights (PDR):

- Historically, several of London's data centres have come forward in existing warehouses and commercial buildings through permitted development rights. However, technology changes and increasing demand for more efficient high-capacity data centres require more bespoke typologies and/or significant alterations to accommodate back-up generation and cooling infrastructure. As such, newer data centre development is unlikely to come forward under permitted development

Site suitability and sustainability

Delivering data centres in London depends on much more than finding land; it requires sites with the right physical, technical, and regulatory conditions for high-spec, energy-intensive development.

A viable site in London must satisfy energy and climate requirements, environmental protection, and increasingly, adhere to policy for air quality. Integrated due diligence and rigorous up-front risk management are critical, as projects with multiple compounding risks may be unviable even where policy and headline infrastructure seem promising.

Core Site and Technical Requirements

Land constraints and viability: High land costs and competition with housing and other industrial sectors make most plots in inner London and zone 2/3 challenging and may drive new development towards the edges of London, especially where latency is of less of a concern. Completed viability exercises must account for remediation requirements, ground conditions, and power grid connection delays, factors that often compound, tipping a project from feasible to unviable.

Power infrastructure: A stable, resilient, and high-capacity power supply, typically 20MW or more, is required. Grid connection delays and limited available headroom have become primary constraints. In many cases, on-site backup generation (batteries, generators) is necessary, but these solutions may raise planning and air quality challenges.

Connectivity: Reliable, low-latency fibre connectivity with at least two points of entry is essential. Proximity to network hubs and telecom exchanges often influences site selection for operators targeting latency-sensitive workloads.

Ground, flood & environmental risk: Many sites, especially in Isle of Dogs and along the Thames, fall within flood zones, demanding expensive flood defences, raised plant, and waterproofing, with ongoing regulatory and insurance implications. Brownfield and former industrial plots often require time-consuming remediation for hydrocarbons, asbestos, or structural deficiencies.

Retrofitting and change of use: Retrofit and conversions are becoming increasingly rare given the increasing structural and technological requirements of modern data centres. Older stock may lack structural loading, HVAC, ceiling height, or air-seal standards for modern IT loads. Planning process and technical feasibility must be weighed together, especially as smaller "edge" deployments grow.

Sustainability and Climate

Carbon and energy: The London Plan SI2 mandates a 35% on-site carbon reduction beyond Part L 2013, backed by connections to low-carbon networks and, in practice, renewable energy contracts[85,86].

Air quality and generators: Data centres increasingly require significant back-up generators to meet customer resilience requirements. GLA and boroughs assess back-up generator impacts on local air quality. Projects must demonstrate compliance with emissions and often require additional mitigation (e.g., ultra-low NOx units). In addition, most backup generators at data centres require an environmental permit from the Environment Agency under the Environmental Permitting Regulations, particularly where capacity exceeds 1 MW or multiple units are aggregated. Permit requirements are influenced by generator size, operating hours, and proximity to sensitive receptors.

Biodiversity and landscape: Under the Environment Act 2021 and London Plan SI13, new data centre projects above 1ha must deliver at least a 10% Biodiversity Net Gain through habitat creation or offset, plus 50% green/brown roof coverage and 30% permeable surfacing for runoff management and ecosystem support[87,88].

Heat reuse and circular economy: London Plan policy increasingly expects data centre operators to capture and sell waste heat for district heating (target: 25% recycled by 2030), often requiring off-take agreements in planning submissions[85]. Circular economy and off-site reuse strengthen both planning success and public benefit cases, as evidenced in the GLA Waste Heat Offtake study[116].

Climate Adaptation: The sequential test under SI12 requires major developments to show flood avoidance at the site level (>1-in-1000 yr), with capex needed for storage, raised plant, and continuity planning for extreme weather, power outage, and water restriction scenarios[89].

An introduction to industrial land availability across London

Data centre development is placing increasing pressure on London's industrial land supply, prompting new planning approaches to balance digital infrastructure needs with competing land uses

The London Industrial Land Supply and Economy Study 2020 highlights increasing pressure on industrial land across London, with data centres emerging as a significant and fast-growing use category[80]. As of 2020, London had approximately 6,800 hectares of industrial land, reflecting an 18% decline since 2001, including a loss of 355 hectares between 2015 and 2020.

In the study, **data centres are classified under "wider industrial uses**", alongside utilities, waste management, and logistics. This is a functional categorisation used within the study itself, not a statutory planning use class.

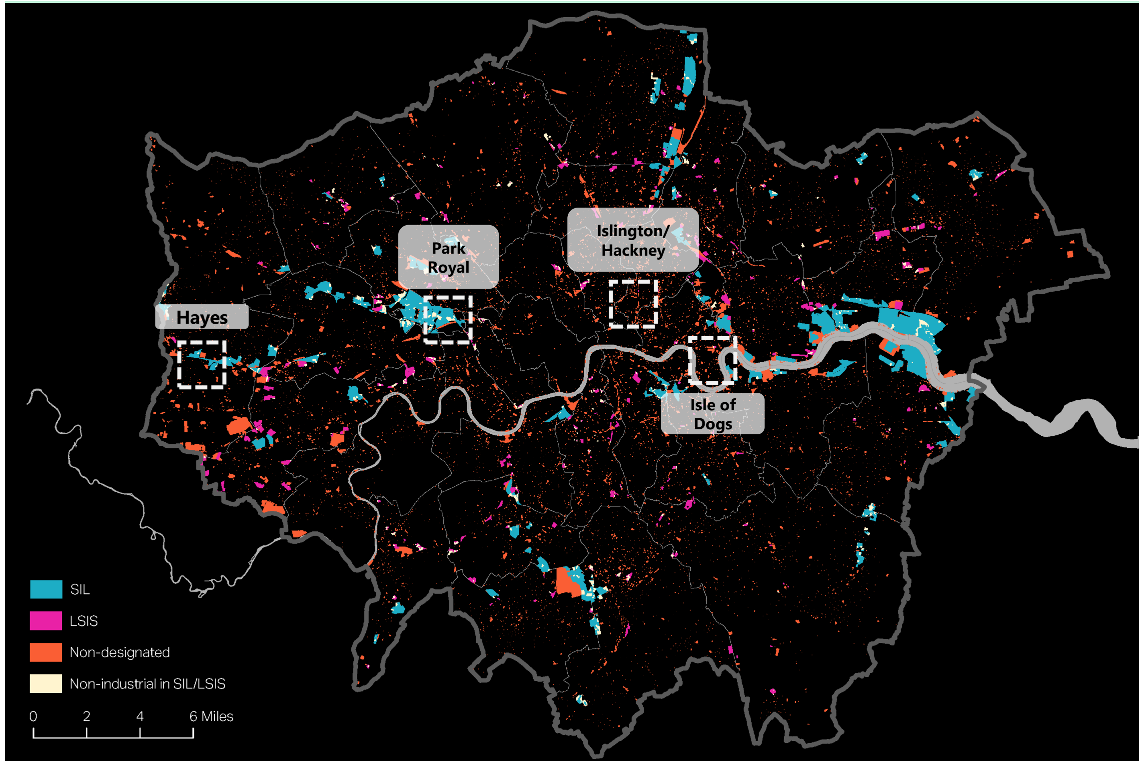
These wider industrial uses collectively account for 33% of London's industrial land, with **data centres occupying 33 hectares citywide**, including **16 hectares in Hillingdon alone**. This reflects their expanding footprint, particularly in Strategic Industrial Locations (SILs) such as Old Oak and Park Royal Development Corporation (OPDC) which are a planning authority that accepts planning applications instead of the borough.

Vacancy rates across industrial land in Greater London are **3.9% London-wide,** indicating a highly constrained market with limited availability for new development.

According to the London Industrial Land Supply and Economy Study 2020, competition in West London is driving land values up by 20–30% compared to East and Southeast London.

In response, developers are investigating strategies such as vertical intensification, cross-boundary site assembly, and even targeting Green Belt fringe sites to accommodate growing demand for data centre space.

Figure 13: Industrial Land in London by designation in 2020



Source: London Industrial Land Supply Study 2020 (March 2023)

A review of vacant industrial land availability by borough

Identifying where industrial land availability supports near-term and long-term growth.

Industrial land availability across London varies significantly, shaping the potential for future data centre development. In western boroughs with established clusters such as Brent, Ealing, and Hillingdon, **vacancy rates are very low, typically below 2%,** reflecting strong demand and limited supply.

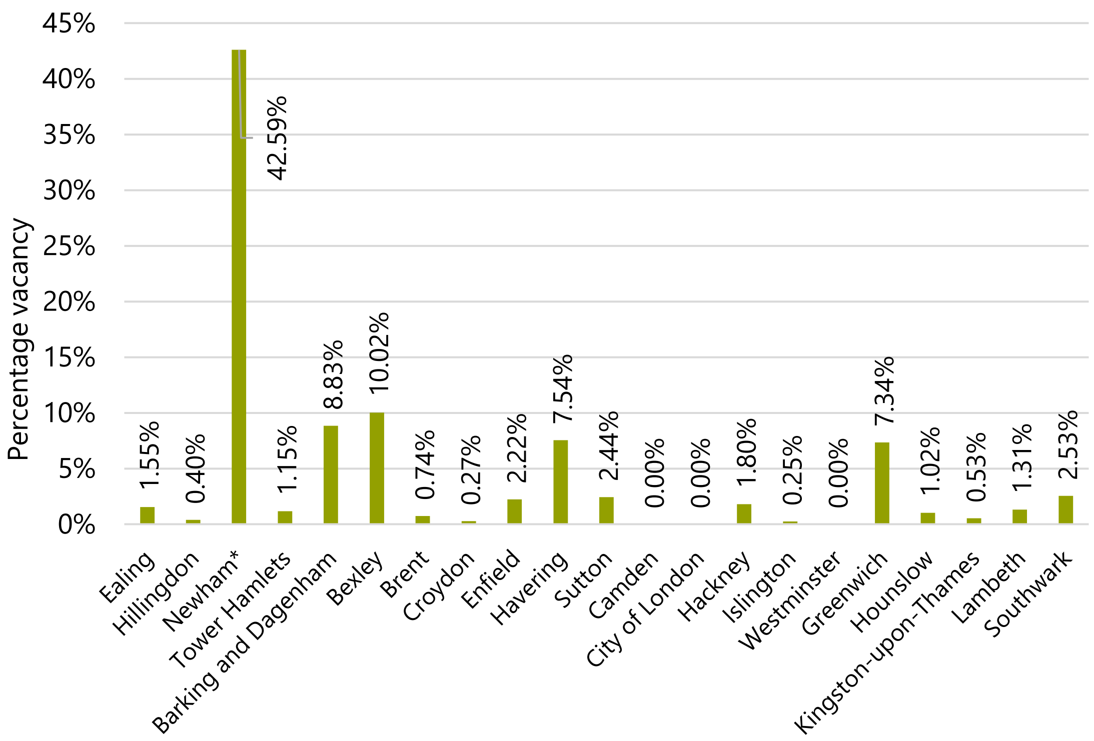
Emerging data centre locations in East London show higher levels of industrial land overall, but vacancy remains constrained. Newham has by far the largest proportion of vacant land, with 36.5 ha available (which includes a strategic mixed-use site), and when omitted makes for more than 40% of its total industrial footprint. Barking & Dagenham, Bexley, and Greenwich have some of the highest industrial land vacancy rates among boroughs with data centre activity, indicating potential for future development as infrastructure investment progresses.

Tower Hamlets and Islington are limited by low vacancy rates and redevelopment pressures. These constrained boroughs have percentage vacancies of 5% and 1% respectively. While these areas benefit from proximity to existing infrastructure and strategic locations, most industrial land is already in active use or earmarked for mixed-use regeneration. Newham has one of the largest industrial land holdings in Inner London, but much of it sits within strategic sites undergoing transformation, reducing immediate availability for large-scale data centre development.

Central boroughs such as Camden, Hackney, and Westminster have little or no available industrial land. While these areas may accommodate smaller-scale or retrofitted developments, their contribution to large-scale capacity is likely to remain limited.

As established earlier in the report the formation of data centre clusters around existing infrastructure like in Ealing, Tower Hamlets and Hillingdon make it clear that there are high industrial land constraints, which will determine data centre growth in the future. **Industrial land vacancy in boroughs with data centre activity**

Figure 14: Industrial land vacancy in boroughs with data centre activity



*Data Source: London Industrial Land Supply Study 2020[80]. *22.7ha belonging to the S01 strategic mixed-use site removed from graph for readability.*

Summary of findings: Land availability for data centre growth

Data centre development across London is shaped by distinct borough-level dynamics, where differences in land availability, infrastructure readiness, and planning pressures have led to concentrated growth in specific areas and along strategic corridors.

Established Clusters: West London SILs	According to the London Industrial Land Supply Study 2020, the **Park Royal / A40 / Heathrow corridor** hosts the largest concentration of data centre land in London, accounting for approximately 26 out of 33 hectares, or **78% of all mapped data centre land** across London. Within this corridor, **Hillingdon alone contributes 16 hectares, the most of any London borough**. These areas benefit from proximity to major National Grid transmission infrastructure as well as SSEN substations, and multiple fibre routes. Remaining developable plots are over 90% occupied, and land values are 20–30% higher than comparable East and Southeast boroughs due to competition with logistics and advanced manufacturing.
Emerging Corridors: East London SIL	Barking & Dagenham and Havering offer **larger contiguous parcels of industrial land**, primarily within SIL designations along the Thames. These areas are proximate to 275 kV National Grid lines. While parcels exist, the majority of riverside industrial land in these boroughs is designated as SIL, offering increased suitability for large-scale data centre development. Vacancy rates in East London remain **10–15%**, compared to **<5%** in West London, **attracting secondary clusters and new data centre entrants.**
Outer London Opportunities	Boroughs on London's periphery offer better grid capacity and more available industrial land of 20–50 ha but may lack established telecommunications infrastructure. Lower land values (–**30% vs West London**) are offset by longer fibre routes and less mature transport links, though new duct runs, and transport upgrades are narrowing these gaps[80].
Cross-Boundary & Co-location strategies	Many suitable sites lie on borough boundaries or in areas where regional coordination is essential. **"Data campus" models** now assemble SIL and adjacent LSIS parcels across borough lines (e.g., Park Royal + Old Oak Common) to achieve **>50 ha contiguous footprints**.
Implications for future growth	These spatial patterns reflect a market where two-thirds of London's data-centres are currently concentrated in established SIL clusters, 20% in emerging corridors, and the remainder held in LSIS or grey belt contingencies, driving ever more creative site assembly and land-use strategies. Strategic larger hyperscale data centre projects have increasingly pursued greenbelt locations to meet space demands. These sites may offer **30–100 ha parcels**, direct substation spurs, and minimal neighbouring conflicts. A notable example is the Havering Digital Freeport, which is being progressed via a Local Development Order (LDO) to streamline planning for a large-scale data centre campus on greenbelt land, however, any proposal affected Green Belt is required to meet stringent tests set out in the NPPF.

Section 6

A review of integrated infrastructure for data centres

This section provides an overview of integrated infrastructure connections for data centres across London, focusing on three essential utilities: water, energy, and fibre. It maps major connection routes to utilities, identifies key stakeholders, and highlights current constraints. The section also summarises both national and regional utility forecasts, offering insights into future capacity, demand pressures, and cross-sector planning challenges.

An introduction to integrated infrastructure for London’s Data Centres

Understanding the interdependencies and demand forecasts from energy, water, and fibre providers.

London’s data centres require reliable connections to **energy, water, and fibre,** delivered through increasingly interdependent infrastructure at both national and local levels. As digital demand grows, scaling these networks has become a key challenge for planners, operators, and regulators.

This section provides a strategic overview of London’s infrastructure landscape, mapping key utility connections and identifying the stakeholders involved. It highlights growing constraints, particularly on the electricity grid, where capacity limitations already risk delaying new developments and prompting calls from Ofgem for urgent reform to the demand connection queue[44].

Drawing on utility forecasts and related datasets, it also explores how each sector is beginning to integrate data centre growth into long-term planning. While coordination varies, there’s a clear shift toward more integrated approaches. Forecasts reveal three critical dimensions:

- Utility access routes and connection points
- Projected growth in demand across all three utilities
- Infrastructure capacity and resilience challenges

Together, these insights support a more joined-up, forward-looking approach to infrastructure planning, essential for the sustainable expansion of London’s data centre ecosystem.

Energy Forecasts

- National: The National Energy System Operator (NESO), formerly National Grid ESO, publishes the annual Future Energy Scenarios (FES), outlining likely trends and capacity requirements, including emerging demands such as data centres. NESO also leads the emerging Regional Energy Strategic Planning (RESP) framework, a national process that brings together regional stakeholders to align energy planning with strategic infrastructure priorities.
- Regional: Electricity distribution operators such as UKPN and SSEN produce Distribution Future Energy Scenarios (DFES) and collaborate with local authorities through Local Area Energy Planning (LAEP). The RESP framework is expected to strengthen coordination between national forecasts and local delivery.

Water Forecasts

- National: The Department for Environment, Food & Rural Affairs (DEFRA) and the Environment Agency coordinate national water resource planning, requiring all water companies to develop and submit Water Resources Management Plans (WRPM). However, the Environment Agency has identified a critical policy gap, noting that current national plans do not sufficiently account for the growing water demand driven by data centres.
- Regional: Utilities such as Thames Water conduct local demand forecasting and scenario modelling in partnership with regional stakeholders. The WRMP 2024 includes a dedicated section on data centres, reflecting their growing impact on non-household demand.

Fibre Forecasts

- National: Ofcom monitors fibre rollout and publishes reports such as Connected Nations, while the National Infrastructure Commission provides long-term projections. However, these reports focus on coverage and do not currently forecast demand from data centres specifically.
- Regional: London boroughs work with public-private partnerships (e.g. West London Alliance, Local London) and providers like BT/Openreach to plan fibre expansion. While these efforts support connectivity, there is no formal forecasting of data centre fibre demand at the local level.

Introduction to utility access routes and connection points

Connecting data centres to London's utility network involves three interdependent processes requiring strategic coordination. Each utility has distinct requirements, timelines, and regulations.

Electricity

Reliable grid access is essential for data centres, typically requiring 132kV+ connections with multiple feeds and backup systems to ensure uptime. In London, **developers must engage early** with National Grid Electricity Transmission for transmission-level access, or DNOs like UKPN/SSEN for distribution-level connections. However, **navigating this is a challenge**, as data centres can often be built faster than supporting grid infrastructure. The recent surge in demand connection applications has now led Ofgem to pursue urgent demand connection reform, including reforms for strategic demand.

Typical Timeline for London:

Up to 5 to 10 years depending on voltage level, queue position and site location. These timeframes may be impacted by initiatives such as Connections Reform.

Water

Water is essential not just for facility maintenance but primarily for cooling, using either closed-loop or open systems to regulate server temperatures and support energy-efficient operations. In the UK, data centres must navigate **Environment Agency licensing for water abstraction**, required for usage above 20 cubic metres per day, and secure supply agreements with local water companies. The process varies significantly depending on consumption volumes, source type (e.g. groundwater vs mains), and environmental impact.

Typical Timeline for London:

Up to 18 months depending on system complexity, licensing requirements and supplier coordination.

Fibre

High-capacity fibre connections are essential for ultra-fast, low-latency data transmission to and from global networks. **Redundant fibre routes and diverse carrier options** are critical to ensure bandwidth, service continuity, and future scalability. London data centres typically **adopt a carrier-neutral strategy**, enabling connections to multiple providers for resilience and performance optimisation. The connection process varies by provider type and service level requirements and is shaped by national efforts to expand gigabit-capable infrastructure, highlighted in Ofcom's Telecoms Access Review 2026–31, which aims to **promote competition and investment** in full-fibre networks across the UK[91].

Typical Timeline for London:

~3 to 6 months for standard connections.

~6 to 18 months for new or high-capacity fibre builds.

NOTE: Electricity grid connection typically represents the longest lead time and can determine overall project viability. Ofgem's Connections Reform is expected to introduce changes that will influence future approaches to securing demand connections, including for data centres. Water licensing may also become critical where abstraction licences are required or alternative sources need to be developed.

A summary of the energy landscape for data centres

Overview of the scale of the energy challenge to meet data centre growth, and an introduction to the key energy infrastructure elements under consideration.

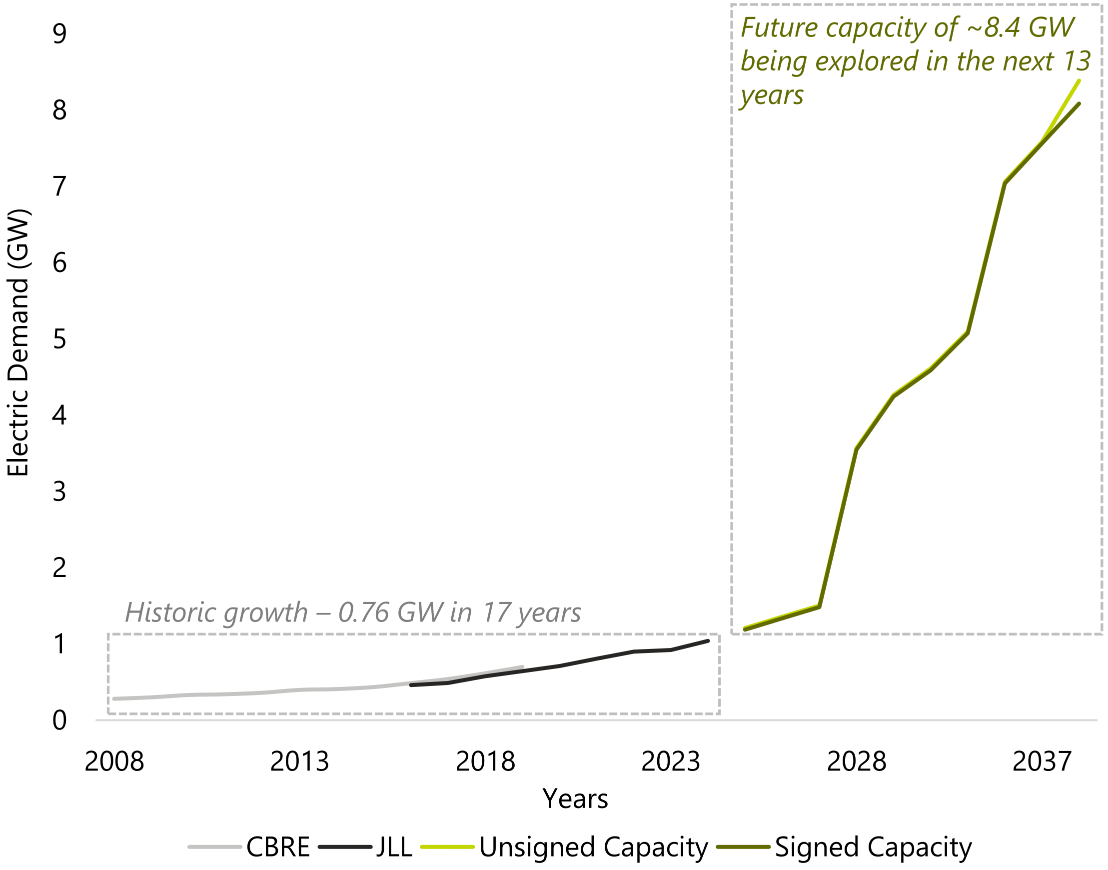
Data centre capacity in London is projected to grow significantly, with a **combined 8.4 GW of signed future capacity** already in the transmission and distribution connection queues. This is equivalent to approximately **2.5 Hinkley Point C nuclear power stations** or the **peak power demand of 2 million domestic heat pumps**. However, speculative development, uncertainty around securing planning approvals beyond grid connection, and financial viability all influence whether projects move forward. The November 2025 Ofgem letter directly acknowledges two key issues highlighted in our analysis. Firstly, that the surge in demand connection applications, driven in large part by data centre projects, now far exceeds even the most ambitious forecasts; and secondly, that there is an urgent need to delineate between speculative and viable projects.

UKPN's Large Demand Dashboard (November 2025) shows an average of 43% maximum utilisation for operational data centres in the UKPN region**, with demand ramping up gradually over time**[92]. This means peak utilisation of signed capacity may not occur until well beyond 2038. Engagement with local authorities suggests existing data centres are actively positioning to access any unused capacity through future planning applications and upgrades, reinforcing the likelihood of **fuller drawdown over time.**

While electricity networks remain the primary energy interface for data centres, two additional system elements are gaining relevance. **Waste heat from data centres** and its potential integration into wider heat networks, supporting broader net zero ambitions and infrastructure deployment. **Gas networks** are attracting increased interest from data centres, driven in part by efforts to avoid delays linked to electricity network reinforcement. As larger connection requests become more common, dedicated gas turbines are emerging as a viable alternative power source, though their direct viability within London is more limited.

The growing interest in gas infrastructure highlights a potential tension between data centre expansion and the UK's net zero goals. Historically, National Grid's FES have projected the fastest data centre growth within their most ambitious decarbonisation pathways. However, the recent surge in demand, particularly in London, where embedded low-carbon generation is limited, may challenge these assumptions, and raise questions about how future growth aligns with long-term sustainability targets.

Figure 16: Historic and projected growth in London's data centre electrical demand



Data Source: Future capacity figures are based on National Grid transmission-level connection queue data and distribution-level connection queue data from UKPN and SSEN (Refer to Appendix 1C). Historical data is sourced from JLL 2025 Data Centre Outlook, and CBRE data referenced in techUK's 2020 Data Centre Sector Overview[93]

BURO HAPPOLD

Energy planning: How FES, DFES, RIIO-ET3, ED2 and ED3 interconnect

Understanding how FES, DFES, RIIO-ET3 and ED2/ED3 shape infrastructure investment and grid readiness in Greater London.

This section analyses the energy factors shaping data centre growth across Greater London, using national and regional demand forecasts alongside transmission and distribution connection data to identify capacity gaps and planning constraints.

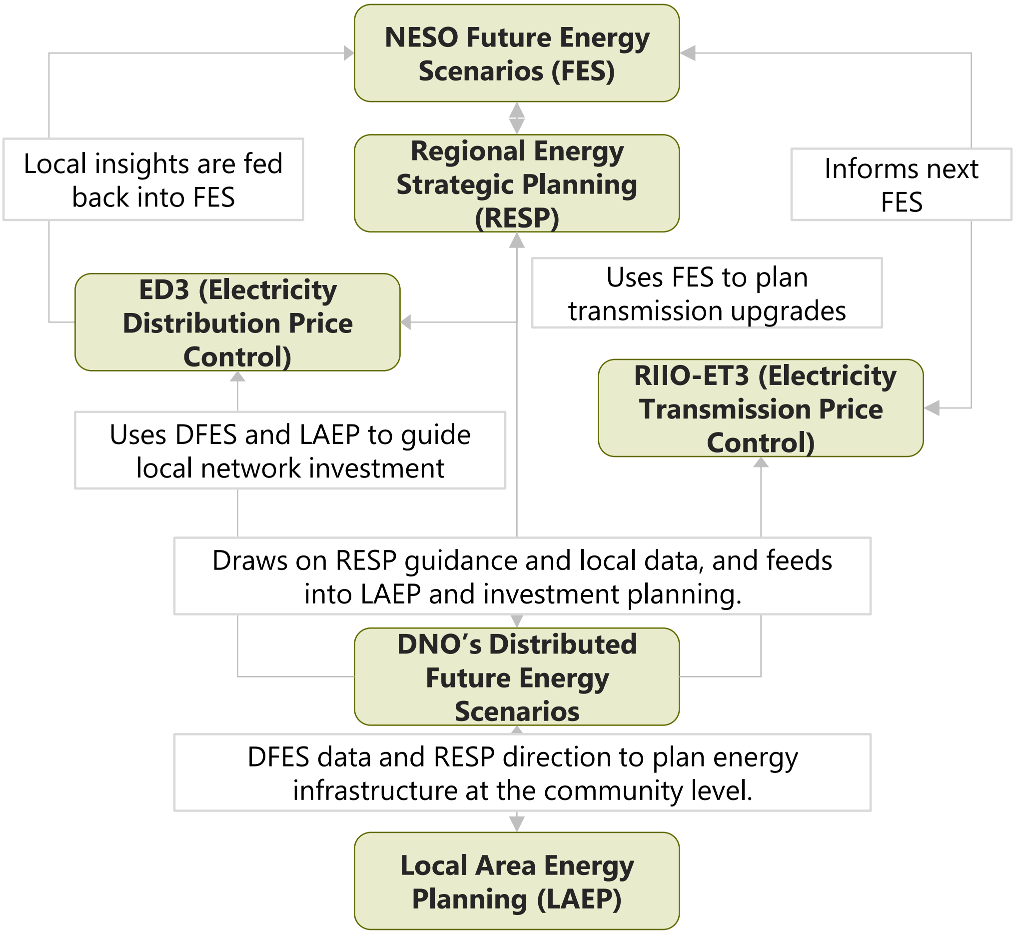
National Forecasting: The FES model the long-term pathways to achieve net zero by 2050, along with a counterfactual. These scenarios include projected electricity demand from data centres and emerging energy loads, and complement planning system operability, informing data centre investment strategies. FES provides national context for regional analysis to shape locally tailored strategies such through the RESP.

Regional Forecasting: Regional DNOs, such as UKPN and SSEN, produce DFES to forecast local energy demand, incorporating borough-scale data and stakeholder engagement. However, treatment of data centre demand varies across operators. Engagement with operators and National Grid aims to harmonise methodologies and activate deployment pressure across the GLA, highlighting hotspots and network constraints within DFES 2024. FES offers the macro picture for most demand growth. However, there are gaps in certainty of data for the short-term growth forecasts. Local Area Energy Plans (LAEPs) provide granular views to boroughs and local government, typically addressing infrastructure or low-voltage layers below typical data centre connections.

Investment Planning – RIIO-ET3 and ED2/ED3

- RIIO-ET3 is the transmission network investment framework for 2026–2031, led by National Grid. It outlines up to £35 billion in investment, and for London it includes infrastructure to support about 8.2 GVA of large demand connections, such as data centres, expected to be installed in T3[94]. Ofgem's Final Determination (December 2025) sets the framework for transmission investment for London infrastructure to support strategic demand such as data centres. The determination includes licence drafting expected by February 2026.
- RIIO-ED2 and ED3 govern distribution network investment. ED3 will respond to accelerated demand growth, integrating outputs from RESP and addressing challenges such as AI-driven demand. Ofgem is encouraging DNOs to integrate outputs from RESPs and to respond to uncertainties such as AI-driven demand growth.

Figure 17: Energy planning frameworks in the UK



NESO Future Energy Scenarios (FES 2025): Data centre demand overview

As the UK accelerates its transition to net zero, data centres are emerging as a critical and fast-growing source of electricity demand.

The NESO Future Energy Scenarios 2025 (FES 2025), published in July, represent the UK's most authoritative strategic outlook on energy demand and supply through to 2050[95]. This is NESO's first independent scenario publication since its separation from National Grid ESO, and it builds on the legacy of previous FES reports. The 2025 edition introduces three distinct net zero pathways, Holistic Transition, Electric Engagement, and Hydrogen Evolution, each underpinned by updated assumptions around technology adoption, policy direction, demand flexibility, and sectoral trends. The Falling Behind pathway considers a world where decarbonisation progress has been made, but insufficient to reach net zero.

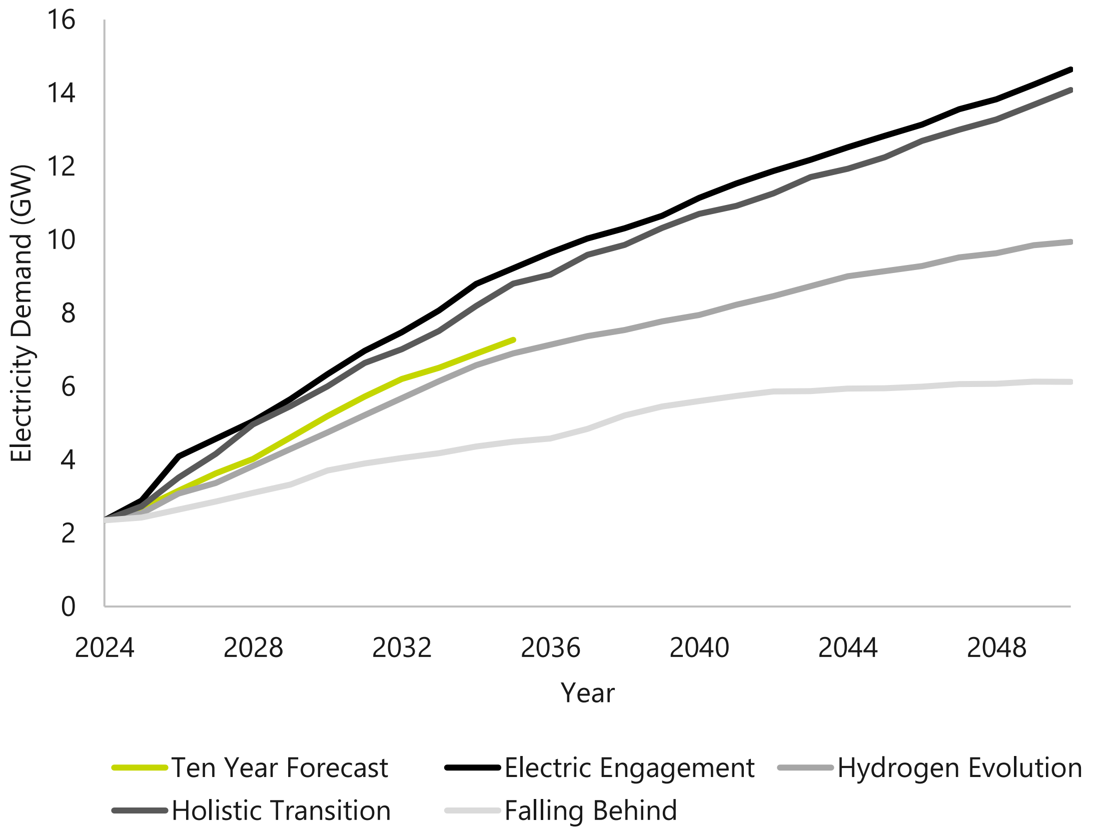
UK electricity demand is projected to rise from **~290 TWh today to up to 785 TWh by 2050**, driven by transport electrification, heat pumps, digitalisation, and data centre growth. Peak demand is expected to increase significantly, requiring major grid upgrades and renewable deployment.

FES 2025 features improved modelling of industrial and commercial demand, with a sharper focus on data centres. NESO now assumes **lower efficiency gains** and **faster ramp-up timelines**, based on recent operational feedback[96]. Current data centre consumption is estimated at **7.6 TWh** from ~**2.4 GW of connected capacity**, mostly in London and the surrounding area.

Looking ahead, NESO forecasts **6-145 GW (30–71 TWh) annual demand by 2050**, reflecting uncertainty around AI adoption, facility size, and location. AI workloads, being less latency-sensitive, could enable broader geographic distribution. Up to **20% of future demand may shift to Scotland**, while **London's share could fall to 60–80%.** This forecast range is almost double that in the 2022 FES, underscoring the sector's volatility and unpredictability.

The modelling also incorporates the UK Government's **2030 target of 6 GW AI-capable data centre capacity**, aligning with the and reinforcing the strategic importance of data centres in national energy planning.

Figure 18: Future Energy Scenarios National Electricity Demand for Data Centres

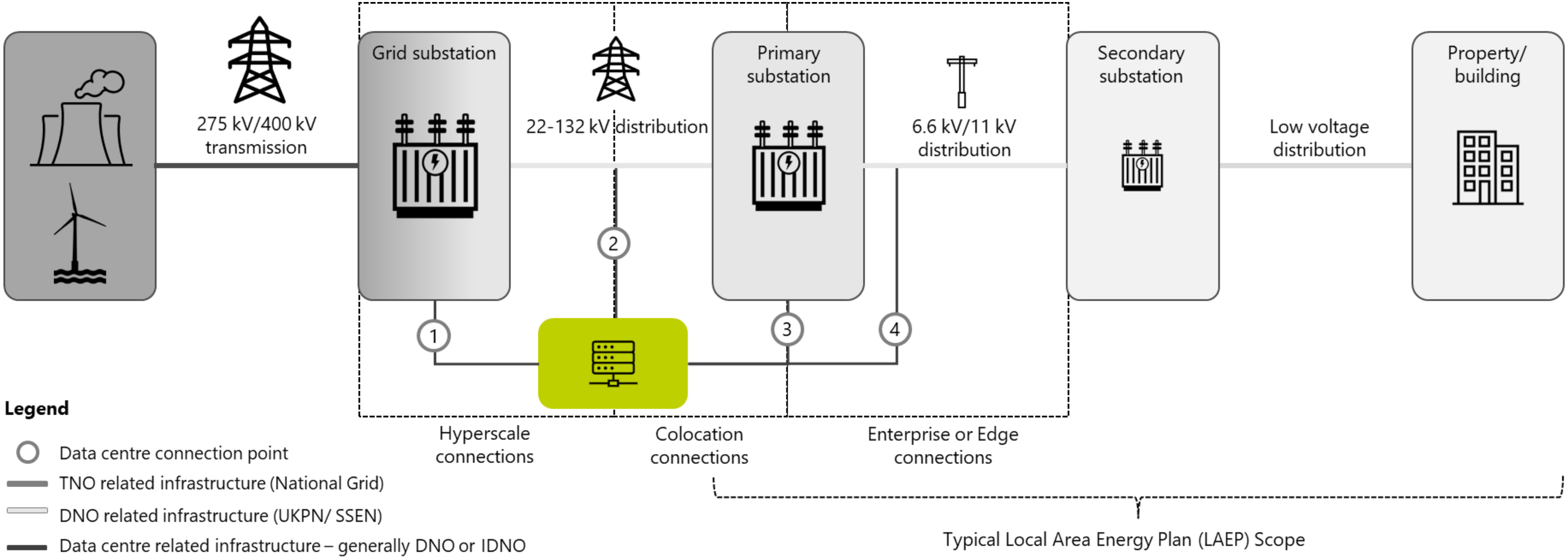


Data Source: Data centre demand Scenarios from 2025 NESO DFES

Visualising electricity grid connections routes in the UK

Summary infographic of the different voltage levels in the UK electricity network and how these relate to potential data centre connection routes

The UK offers distinct grid connection pathways for data centres, each with specific advantages. Historically, **DNOs have been the most common route**, but National Grid's connection data highlight there is a **growing trend toward TNO connections** for the largest facilities requiring direct access to the transmission network. Ongoing connection reforms, led by the NESO and the Department for Energy Security and Net Zero (DESNZ) are **exploring ways to streamline and potentially accelerate connections across all pathways**, particularly for strategic demand projects like data centres



NESO Future Energy Scenarios (FES 2025): London specific implications

As the UK accelerates its transition to net zero, data centres are emerging as a critical and fast-growing source of electricity demand.

Spatial Distribution and Regional Share

NESO's spatial modelling projects that London's share of UK data centre demand may decline to between 60–80% of UK data centre capacity over the coming decades. This shift is driven by the rise of AI infrastructure and the creation of AI Growth Zones, which in some cases is less latency-sensitive and more power-intensive, enabling deployment in regions with greater grid capacity. Additionally, infrastructure constraints in London, are creating push and pull factors that favour growth in other regions such as Scotland, Wales, and East England.

Scenario Alignment

Of NESO's four FES 2025 pathways, the Holistic Transition and Electric Engagement scenarios in FES 2025 are considered most relevant for London because they incorporate high levels of electrification, strong consumer engagement, and rapid decarbonisation pathways within their national projections. These elements closely mirror the strategic priorities set out in London's own energy and climate strategy and its Local Area Energy Plans (LAEPs), which focuses on electrifying transport and heating, engaging consumers in demand flexibility and efficiency, and pursuing net zero goals ahead of the national timeline. Given the close alignment between Holistic Transition and Electrical Engagement, and NESO's use of Holistic Transition as the focus scenario, it will be the scenario integrated into the analysis outlined in Section 7.

Infrastructure Dependency

NESO anticipates continued growth in London's data centre sector, supported by a substantial connection queue that reflects strong market demand. However, the November 2025 highlights that demand for grid connections now far exceeds even the most ambitious forecasts, largely due to data centre projects. Ofgem is reforming the process to "curate a viable queue," prioritising projects that are ready and removing speculative applications to ensure grid capacity is allocated efficiently. Under the TM04+ reforms, future access will depend on project readiness, planning approvals, and demonstrated grid benefits, not just queue position. The introduction of a 6-monthly Gate 2 window for transmission connections may introduce timing risks for some developers, especially those acquiring land later in the process. As a result, more developers **may consider distribution network (DNO) routes**, which can offer greater flexibility and, in some cases, faster access depending on location and available capacity.

Decarbonisation Targets and System Impacts

London's goal to achieve net zero by 2030, far ahead of the UK's 2050 deadline, adds complexity and urgency. The GLA's preferred Accelerated Green pathway, as reflected in the LAEPs, assumes **fast deployment of renewables, electrification, and energy efficiency**, which will bring forward system constraints earlier than NESO's national forecasts[97]. While the Holistic Transition scenario provides a useful national benchmark for energy system transformation, it does not fully capture the spatial and temporal pressures unique to London. The LAEPs highlight borough-level variability, infrastructure bottlenecks, and concentrated demand growth (e.g. from data centres), which require more granular planning than national scenarios can offer. Therefore, integrating LAEP insights into scenario modelling is essential for accurately assessing system impacts and delivery risk in London.

Electricity grid in the UK

Data centres in the UK can connect to the electricity grid through three pathways, depending on power needs, location, timing, and cost. However, transmission network constraints limit how both Distribution Network Operators and Independent Distribution Network Operators can support new data centre connections.

Transmission Network Operator (TNO)

Definition: To manage the high-voltage electricity transmission network across Great Britain, operating at 275 kV and 400 kV. National Grid Electricity Transmission (NGET) is the primary TNO for England and Wales and is responsible for the core transmission infrastructure that delivers electricity across the country.

- **Power capacity range:** Typically, 100 MW+.
- **Voltage levels:** 275 kV/ 400 kV transmission networks.
- **Target customers:** hyperscale and large colocation facilities requiring substantial and stable power supply.
- **Connection process:** Governed by dedicated transmission connection procedures, including formal application windows and readiness assessments.
- **Typical timescales:** Historically, 5+ years, with a target to reduce to 6 months for viable projects[98].
- **Application requirements:** Must meet "readiness criteria" (e.g. land control or planning status) and demonstrate strategic alignment with net zero goals.
- **Notable London Infrastructure:** Uxbridge Moor Substation (1.8 GW capacity) designed for London and Slough data centres, with an estimated completion 2029.

Distribution Network Operators (DNOs)

Definition: DNOs own and operate the regional electricity distribution networks across Great Britain. These networks deliver power from the high-voltage transmission system to end users at voltages of 132kV and below. There are 14 geographically defined DNO regions, each functioning as a regulated monopoly under the oversight of Ofgem.

- **Power Capacity Range:** Typically, <100 MW but confections as high as 300 MW are emerging in London.
- **Voltage levels:** Up to 132 kV.
- **Target customers:** Standard commercial data centres, colocation providers, and enterprise facilities.
- **Connection Process:** DNOs required to provide a formal connection offer within three months of receiving complete application information[99].
- **Typical Timelines:** 2-24 months for ramping solutions. Longer delays can occur due to wider transmission capacity constraints.
- **Application Requirements:** Must include site plans, load requirements, and technical specifications.
- **Notable London Infrastructure:** UKPN serves most of London, with East London being particularly significant for data centres, while SSEN covers West London. Capacity constraints are evident across both areas, with severe limitations in some zones.

Independent Distribution Network Operators (IDNO)

Definition: Are licensed companies that develop, operate, and maintain local electricity distribution networks. Introduced in 2000 to increase competition in electricity connections, IDNOs differ from traditional DNOs in that they are not geographically restricted.

- **Power Capacity Range:** Typically, <100 MW, with proven hyperscale capability and staged growth options
- **Voltage levels:** Up to 132 kV substations but currently cannot operate transmission equipment (275 kV/400 kV)
- **Target customers:** Those seeking fast-track delivery, cross-boundary flexibility, and commercial innovation.
- **Connection Process:** Governed by flexible procedures, often involving negotiated boundary arrangements and asset adoption agreements.
- **Typical Timelines:** 1–3 years, driven by innovative design, equipment optimisation, and commercial agility. While some IDNOs can reduce the lead times, wider network upgrades may still be required, causing delays.
- **Application Requirements:** Commercial adoption agreements and bilateral connection arrangements with host DNOs or transmission operators.
- **Regulatory Outlook**: DESNZ and Ofgem are reviewing proposals to update IDNO regulations as part of efforts to accelerate grid connections for AI Growth Zones[42].

Electricity utility providers in Greater London

Understanding the footprint of critical utilities serving London's data centre ecosystem.

UK Power Networks (UKPN) is the licensed DNO for electricity distribution across Central, East, and South London, with coverage extending into parts of North and Inner West London. It serves high-demand boroughs such as the City of London, Westminster, and Tower Hamlets, which host dense commercial activity and critical infrastructure.

The **Isle of Dogs, is a key hub for data centre development** but faces spatial constraints, making infrastructure deployment more challenging. This concentration of energy-intensive facilities contributes to Tower Hamlets ranking 5th in electricity consumption among English local authorities, and 2nd in London, behind Westminster[100].

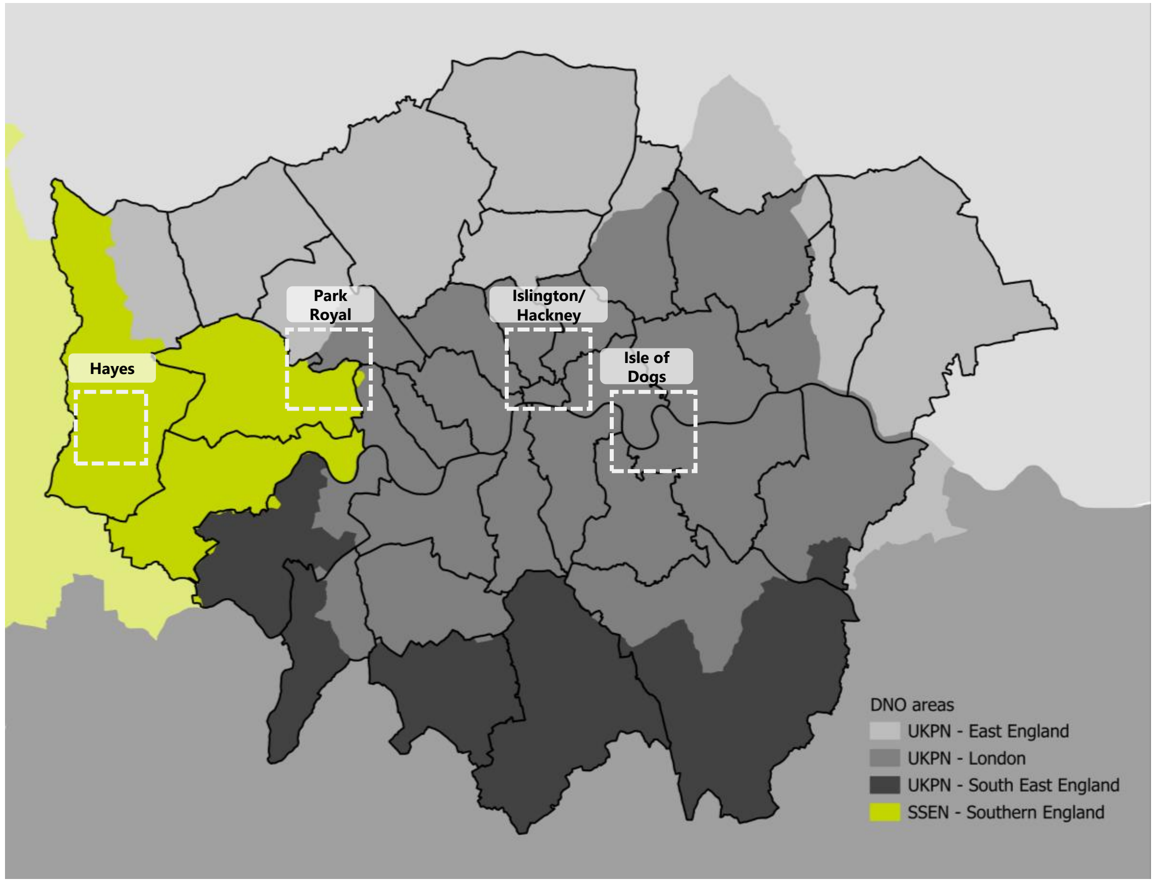
Scottish & Southern Electricity (SSEN) covers West and Outer West London, serving key boroughs such as Hillingdon, Ealing, and Hounslow. After Tower Hamlets, Hayes/Heathrow and Park Royal host the second-largest concentration of data centres in London. SSEN also covers Slough, which has significant level of existing and planned data centres, with implications for the West London network.

Previous Local Area Energy Planning (LAEP) work has highlighted the challenge of accommodating rapid data centre growth in West London, particularly alongside wider net zero-driven system electrification.

National Grid Electricity Transmission operates the high-voltage transmission network across all of London, with grid substations located in 21 local authorities. It supports connections across the four DNO operating areas within the GLA boundary, despite there being only two licensed DNOs (UKPN and SSEN).

The London region continues to face significant growth in data centre connection requests, together with rising electrical demand from broader growth and decarbonisation. This underscores the need for a holistic planning approach that considers cross-boundary connection flows and infrastructure coordination to ensure network capacity keeps pace with demand.

Figure 19: DNO network areas in London and surrounding regions



DNO network areas in London and the surrounding local authorities.

Requested capacity in the context of National Grid infrastructure

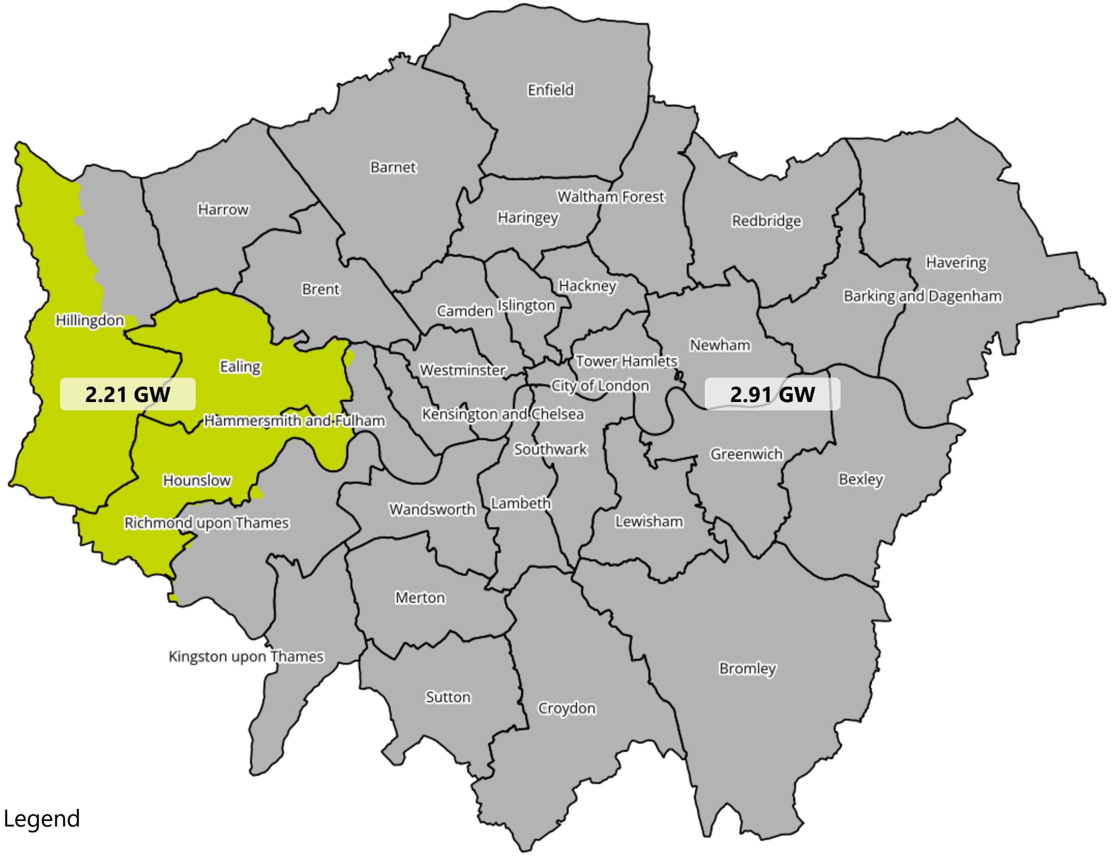
Examining the National Grid transmission level Connection Queue by DNO area.

The National Grid Data Centre Connection Queue provides a view of new developments connecting at transmission level and their potential impact on upstream electricity network capacity. This analysis focuses on centres connecting directly to the transmission network, with DNO-level connections addressed separately. Data is attributed to substation locations rather than end users, meaning demand cannot be accurately assigned to boroughs. While mapping to grid supply points is possible, data centres may be located far from these points. To simplify and relate transmission-level capacity to the Greater London area, capacity is grouped into four broad geographic zones that broadly align with the same distribution geographic responsibilities of UKPN and SSEN.

- **West:** Uxbridge Moor (also serving Slough), Laleham, and a new planned connection node, with a combined capacity of 2.21 GW.
- **North West:** Letchmore Heath and Amersham, adding 0.92 GW, some likely supporting Park Royal in Ealing.
- **North / North East:** Potential new North/ North East connection node extending south through Enfield from Waltham Cross and the North East, accounting for 1.66 GW.
- **East:** Barking (0.33 GW) plus significant DNO-level activity, notably Havering's Data Freeport, bringing total eastern capacity closer to other growth areas.

The complexity of this supply, where substations feed multiple boroughs and most key nodes sit outside the Greater London boundary, underscores the need for collaboration across political and network boundaries to understand this rapidly evolving landscape. A further challenge is speculative grid reservations by landowners and developers. While Ofgem and NESO have acknowledged the issue, **transparency around connection queues remains limited**, and much of the evidence is anecdotal. This surge in connection requests has worsened bottlenecks in power-stressed areas like West London and limited visibility into grid capacity allocation makes planning difficult. Some data centres are now **seeking longer-distance connections to access capacity sooner**, creating ambiguity between where connections are requested and where sites are actually located.

Figure 20: Data centre transmission-level connection queue capacity



Legend

- West - 2.21 GW of potential transmission-level capacity
- North, East and North East- 2.91 GW of potential transmission-level capacity

Data Source: National Grid Data Centre Connection Queue September 2025.

A spatial view of transmission-level connections for pipeline data centres

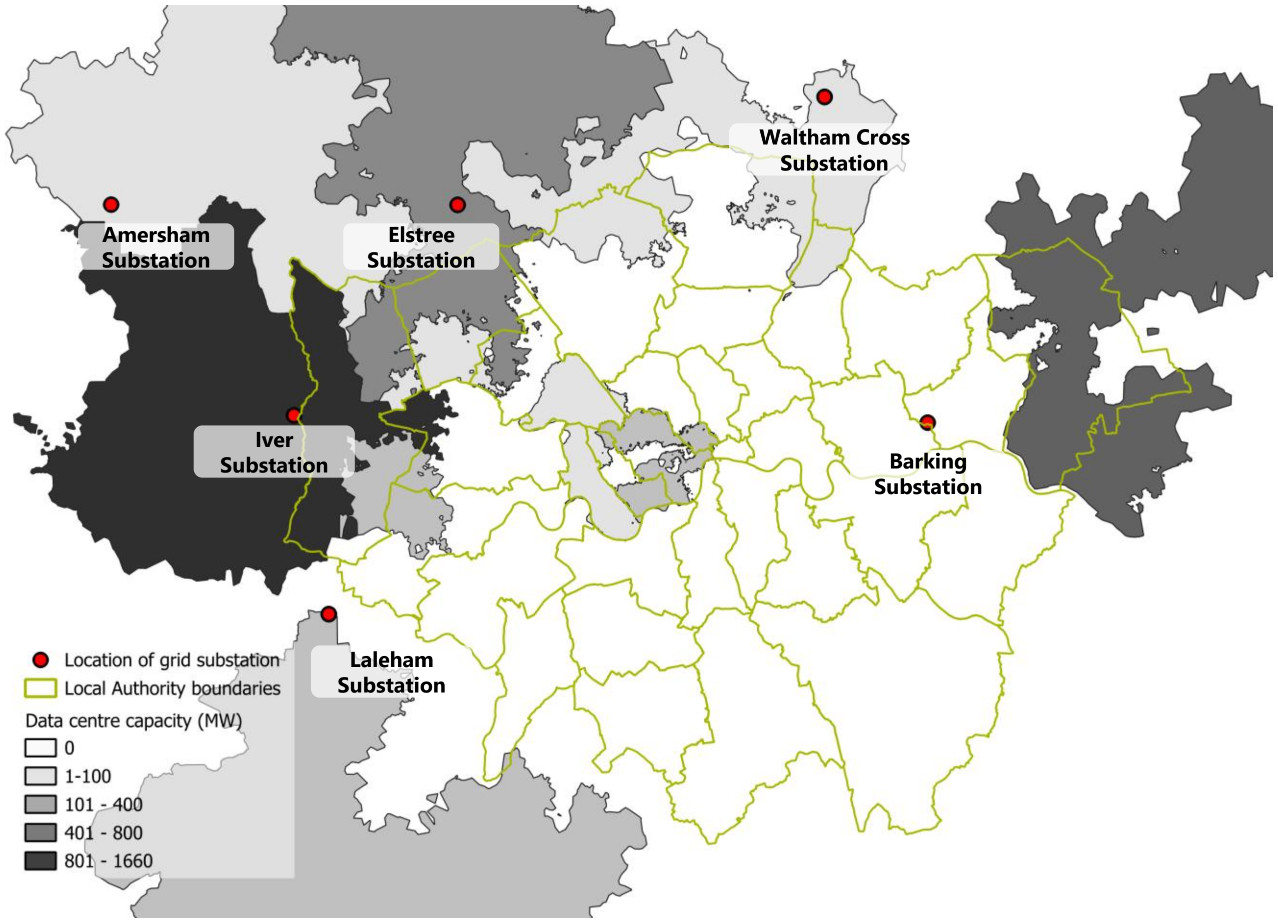
Visualising the existing and planned data centre capacity at a borough-by-borough level, based on connection data from National Grid.

The map on the right illustrates the transmission-level connection queue for data centres, attributed to areas served by National Grid substations (Grid Supply Points, or GSPs). Each red dot represents a GSP location, acting as a critical interface between the high-voltage transmission network and the regional distribution system.

The concentration of queued capacity in the west of London reinforces the suggestion of either a shift towards alternative connection arrangements, such as transmission-level connections or IDNOs, or that some of this capacity is linked to data centres located outside the GLA boundary.

In contrast, most connections in the east are expected to occur at the distribution level rather than through transmission-level GSPs, reflecting differences in grid infrastructure and connection strategies across the region. This highlights the need for coordinated planning between transmission and distribution networks to manage regional demand effectively.

Figure 21: Data centre connections to grid substations



Data Source: National Grid Data Centre Connection Queue September 2025.

Examining emerging trends in National Grid transmission connection queue

London's transmission connection queue for data centres now stands at nearly 7 GW, driven by much larger connection requests.

There is currently 6.84 GW of capacity in the National Grid connection queue, including **5.12 GW of transmission connections**. Nearly 2 GW is expected online before 2030, over five times today's connected data centre demand. This aligns with the scale of strategic demand highlighted in National Grid's RIIO-ET3 Business Plan, which outlines the infrastructure required to support this level of growth. The most significant annual increase to date occurred in **2023–2024**, with around **0.12 GW** of additional capacity added. This suggests that data centre growth is **accelerating well beyond historical trends.**

Future data centre development is trending toward much larger connections, with the grid connection queue showing an **average request of about 0.165 GW (165 MW).** As connection dates can be nearly a decade out, operators typically secure power long before entering planning. This means planning data can understate future growth, as applications are delayed until closer to energisation. **Grid access has therefore become the first priority**, with planning a secondary step, making connection data the **stronger indicator of medium-term expansion**.

Figure 22: National Grid transmission-level connections queue

Data Source: National Grid Data Centre Connection Queue (September 2025)

BURO HAPPOLD

London transmission grid: Forecasted pressure

An overview of the overall outlook and planned transmission level actions in London.

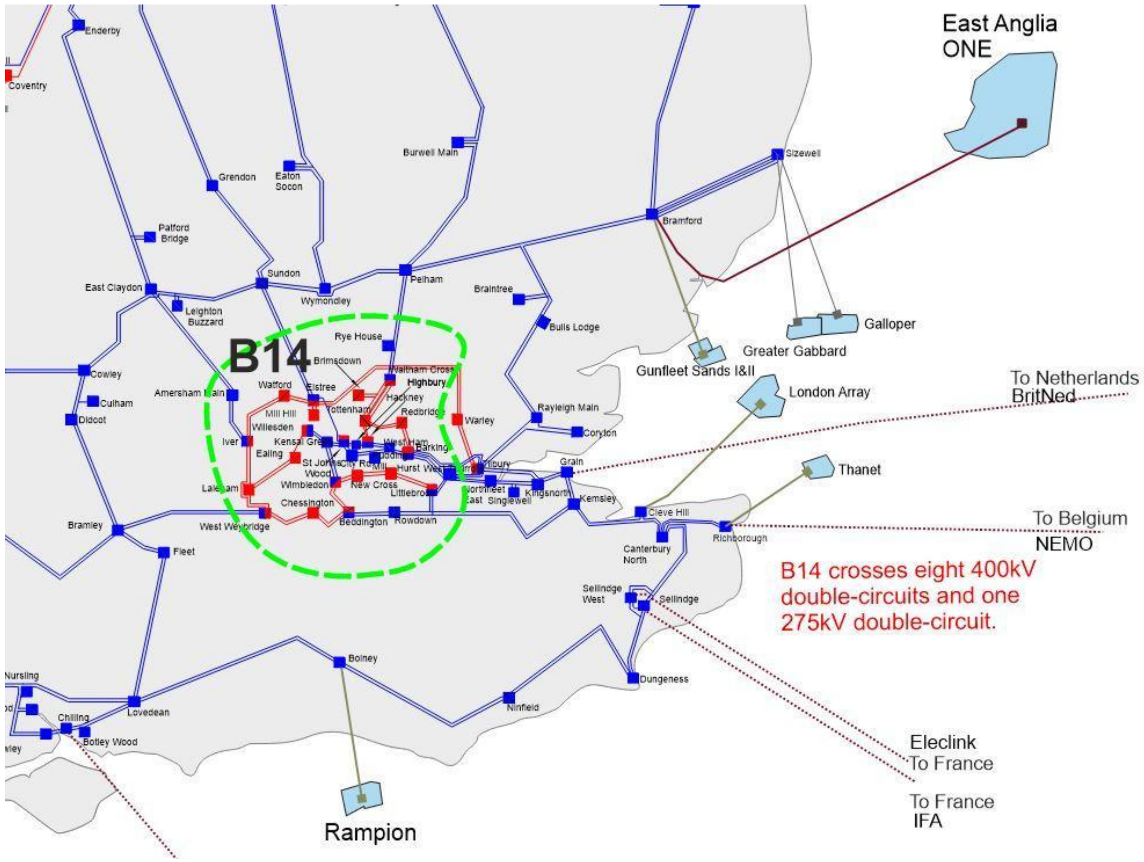
Demand Growth: Electricity demand in London is expected to rise steadily, with the electrification of transport and heating being large contributors to this growth. Under the NESO FES Holistic Transition scenario annual electricity consumption in London is expected to grow from 26.8 TWh/yr in 2025 to 58.3 TWh/yr in 2050.

Interconnector Activity: London's transmission network is heavily influenced by interconnectors such as IFA, Nemo Link, and ElecLink, located along the south coast. These assets contribute to power flow volatility, with interconnector flows capable of swinging by up to 4 GW, placing significant stress on the London grid, as highlighted in NESO's Electricity Ten Year Statement[101].

Grid Bottlenecks: Potential transmission bottlenecks are emerging around key Grid Supply Points (GSPs) including Wimbledon, New Cross, and Barking. These are driven by rising demand from urban growth and electrification and are flagged in NESO's regional network assessments as areas requiring close monitoring and potential reinforcement[102]. There are major conductor upgrades to help overcome these issues, highlighted in the RIIO-ET3 plan. These include reconducting 213 km of overhead line and replacing 65 km of underground cables (e.g. the Barking and West London Cable Strategy and Waltham Cross to Hackney).

Reinforcement Needs: Transmission boundaries B14 (London) and LE1 (Southeast England) are forecast to experience flows that exceed current capabilities by 2030. Reinforcements are planned under the Beyond 2030 strategy, which includes upgrades to manage bidirectional flows from interconnectors and increased regional demand

Figure 23: London B14 transmission boundary



Source: Boundary B14 – London sources from South Wales and South England Boundaries – NESO

London transmission grid: National Grid planned solutions and projects

London's transmission grid is undergoing major upgrades and planned investments, with critical solutions aimed at supporting data centre growth, net zero targets, and alleviating capacity constraints. This information could change subject to outcomes from Ofgem's final determination and investment decisions

Uxbridge Moor: A new substation at Uxbridge Moor, adjacent to Iver substation, delivering around **1.8 GW of capacity**, sufficient to supply a mid-sized city and cover over a dozen new data centres[103]. It will feature SF6-free GIS switchgear and is the largest substation of its type in the UK. Its primary service territories are Slough and Hillingdon, with configuration based on queue modelling across substation areas.

Major Substation Upgrades: Warley, Barking, and Elstree substations are cited in National Grid's transmission business plan for substantial upgrades, including full rebuilds and major interventions[94]. These investments are designed to unlock network capacity, relieve the National Grid Connection Queue, and reduce lead times for new developments. The plan highlights that timely planning and deployment of transmission-level upgrades is critical for supporting London's growth and resilience.

West London Cabling Strategy: A strategic investment aiming to unlock capacity in boroughs such as Hounslow, Hillingdon, and Ealing[104]. New ramped and flexible connection models have already accelerated several projects, while continued investment includes battery storage and flexibility services for system balancing. Crucially, a new overhead transmission line from the South West into Slough East is projected for delivery by 2036–2037 to support future growth and ambitious electrification initiatives.

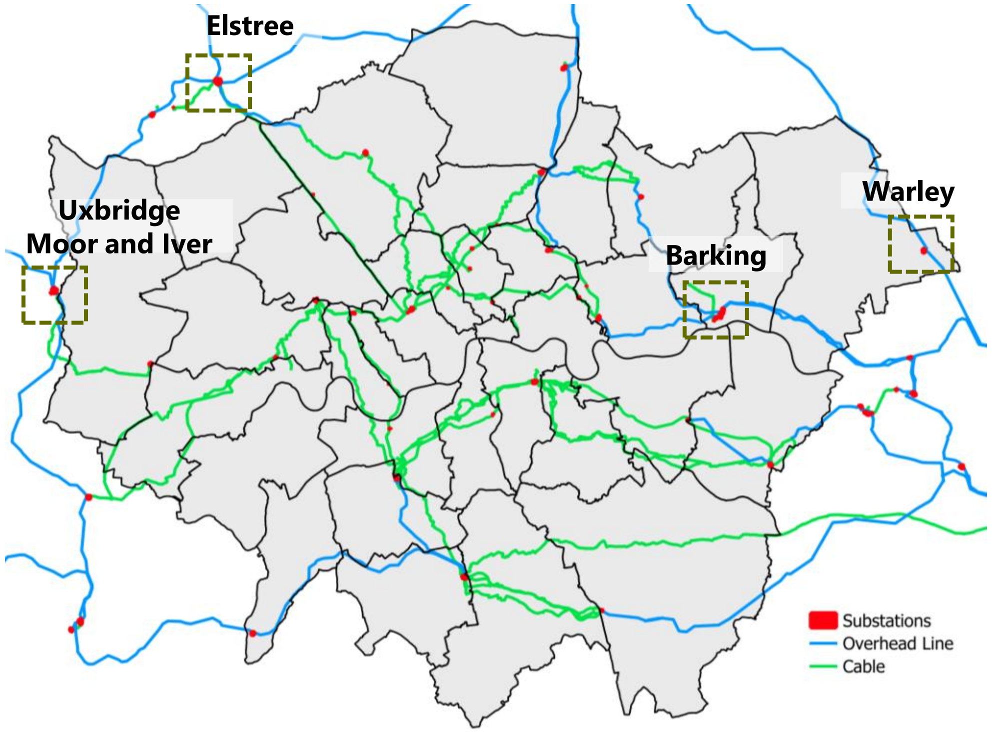
London Power Tunnels Phase 2: A £1 billion program providing 32.5 km of deep-level cable tunnels, replacing aging circuits and interlinking substations between Wimbledon, New Cross, Kidbrooke, and Bengeworth Road[105]. Set for completion in 2026, this will future-proof supply and substation capacity.

North London Reinforcement Project: Part of the Great Grid Upgrade, this project will replace the 275 kV overhead line between Pelham and Hackney with a 400 kV line, increasing capacity across Hertfordshire, Enfield, Tottenham, and Hackney. Construction began in 2025 and will complete by 2028[106].

Additional Strategic Projects (NESO)

- NESO's 200 MVA reactive power absorption contracts, addressing high-voltage constraints from renewables[107].
- NESO Constraint Management Interstrip Services for future expansion into London to handle post-fault grid stress[108].
- NESO Centralised Strategic Network Plan, focuses on whole-system integration for network planning[109].

Figure 24: National Grid infrastructure across Greater London

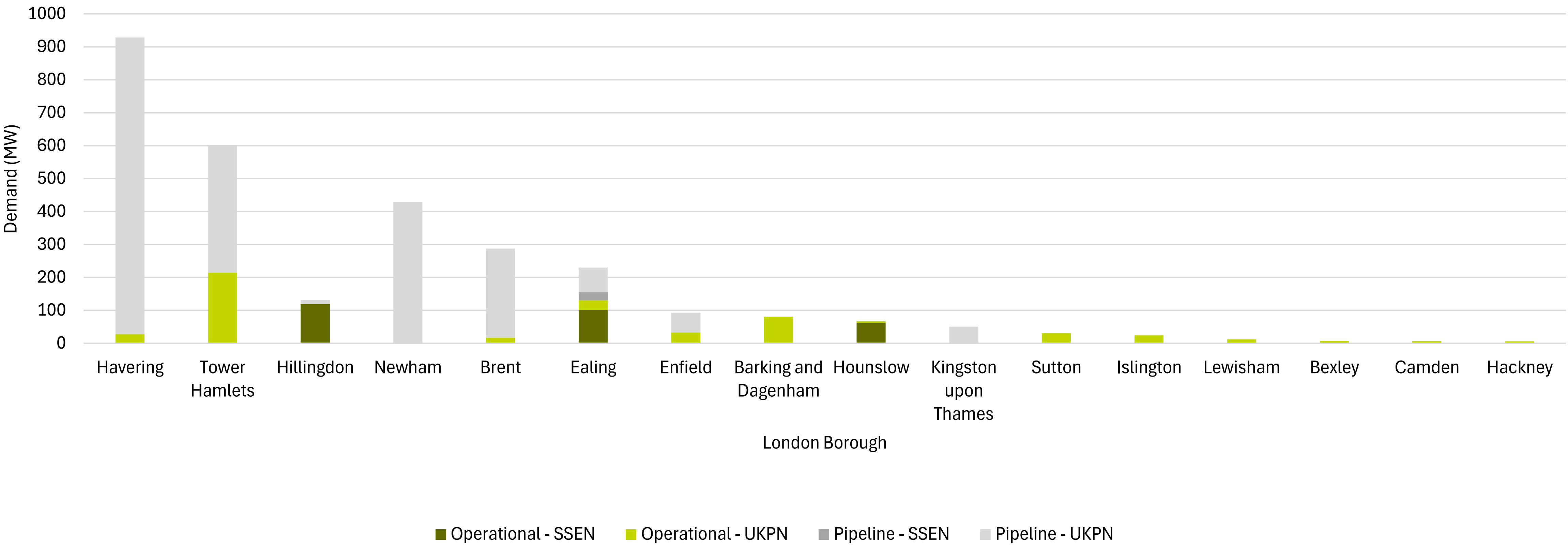


Data Source: National Grid – National route maps.

Summary of distribution connections for existing and pipeline data centres

The graph below presents a borough-by-borough summary of contracted distribution-level data centre capacity, both existing and in the pipeline, totaling 2,984 MW. This data highlights the significant role of DNOs in enabling data centre growth, with a broad spread of capacity across London.

Figure 25: Data Centres connecting at Distribution Level (UKPN / SSEN)



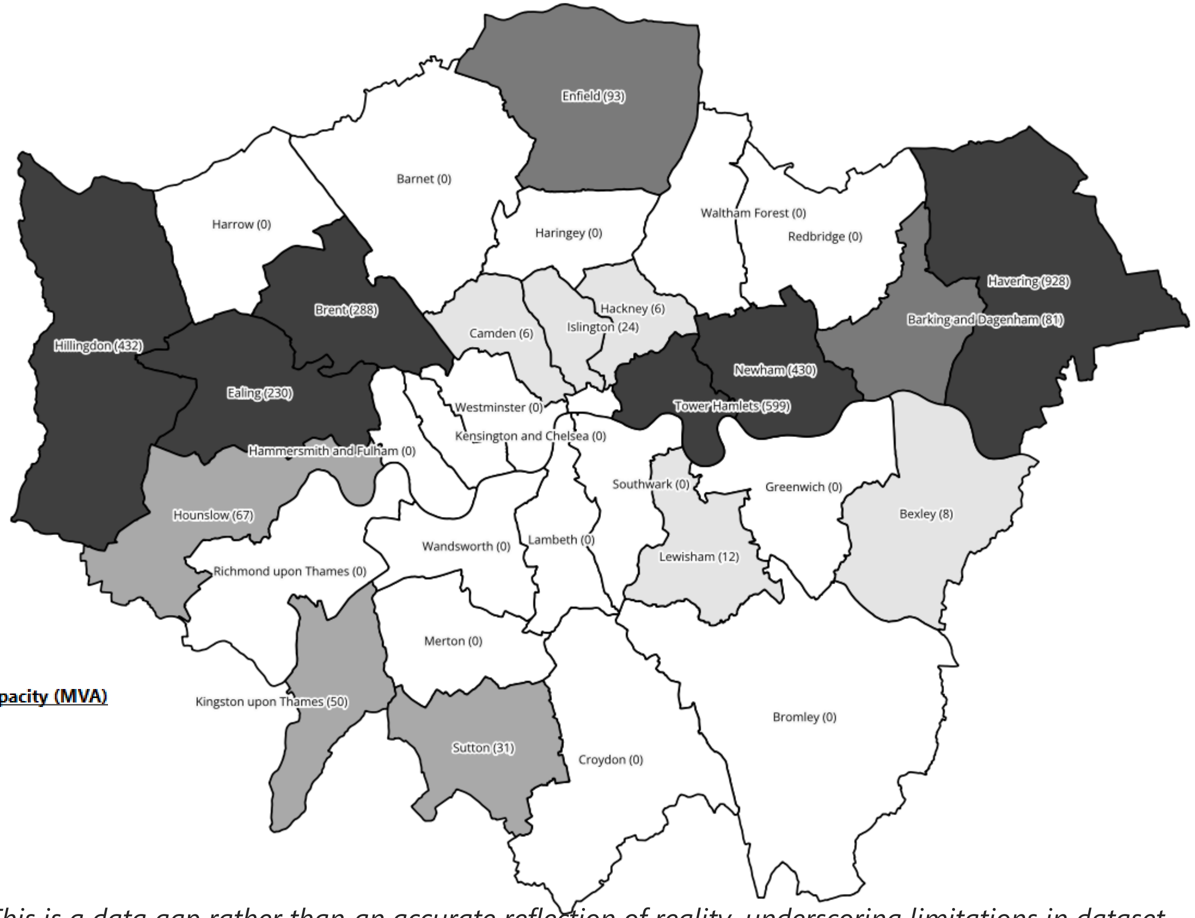
Data Source: Aggregated data from UKPN and SSEN Connection Queue (August/ June 2025)

Distribution-level connections for existing and pipeline data centres

Visualising the existing and planned data centre capacity at a borough-by-borough level, based on connection data from UKPN and SSEN.

Figure 26: Existing data centre distribution capacity

Figure 27: Planned and existing data centre distribution capacity



Note: The City of London shows no existing or planned data centre capacity in the DNO dataset. This is a data gap rather than an accurate reflection of reality, underscoring limitations in dataset completeness and reporting.

Trends and patterns in capacity: electricity networks (SSEN)

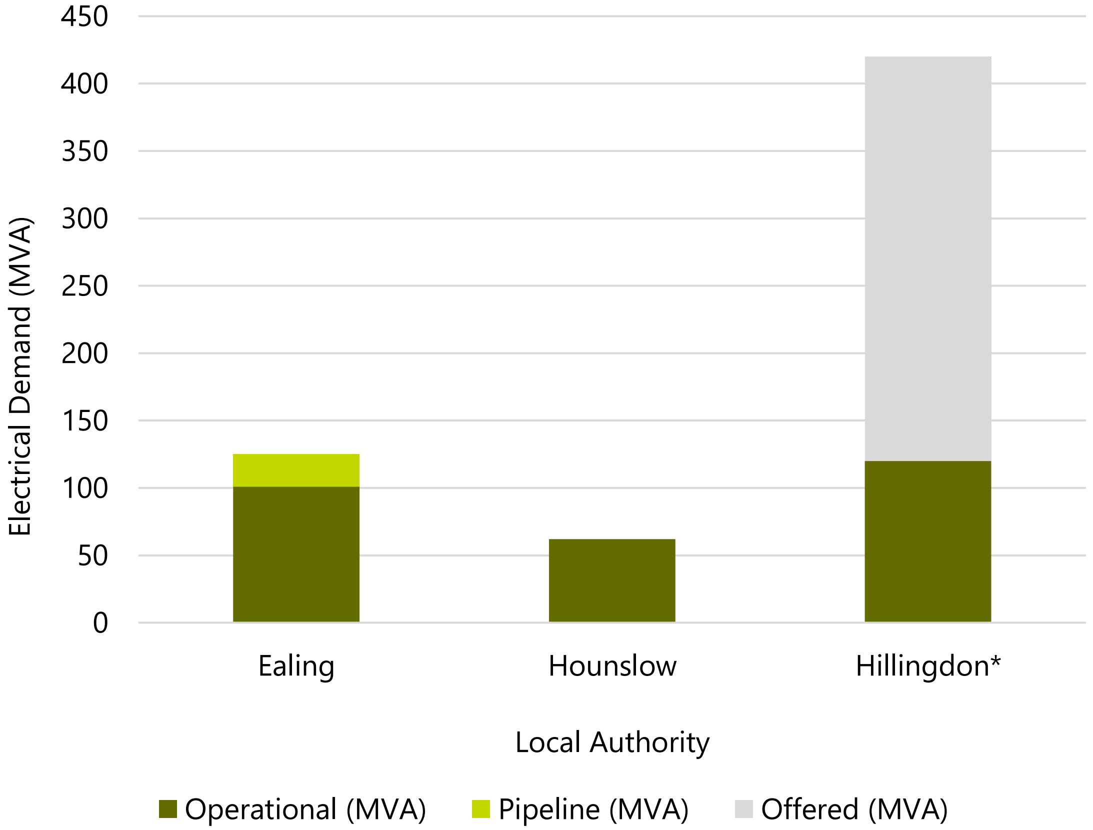
SSEN's connection data, viewed alongside National Grid figures, points to a structural shift in how West London's data centre infrastructure is developing, relying increasingly on a hybrid of new SSEN substations and transmission-level connections

SSEN's 2024 DFES highlights data centre expansion across West London and its surrounding areas, one of the UK's primary hubs[110]. SSEN reports 0.805 GW of operational data centre capacity, of which 0.283 GW is located within the boroughs of Hounslow, Hillingdon, and Ealing, with most of the remainder in Slough. The development pipeline has expanded sharply to 2.2 GW, representing a **170% increase relative to the current operational base** and nearly double the pipeline reported in the 2023 DFES. Of this projected capacity, **324 MW is attributed to Greater London boroughs through SSEN distribution connections.**

However, this DFES outlook appears modest when compared to National Grid's connection queue data, which shows an **additional 2.2 GW of transmission-connected capacity planned within the same West London corridor**. Taken together, the combined upcoming capacity reaches approximately 2.534 GW, underscoring the scale of growth beyond what SSEN's distribution forecasts alone capture. This suggests much of the growth may be connecting at the transmission level or via IDNOs, rather than through SSEN's distribution network, unless some relates to sites outside the GLA boundary.

Nevertheless, SSEN's DFES projects 3,851 MW of future distribution-connected data centre demand, scaled to the SSEN licence area by Regen. Although not yet assigned to specific substations, this number serves as a placeholder for anticipated load growth. Recent SSEN connection queue data shows Ealing at 125 MVA, Hounslow at 62 MVA, and Hillingdon with 120 MVA connected and an additional 300 MVA offered. Planning records also indicate six proposed data centres for Hillingdon. To contextualise, 300 MVA is similar to the demand of 86,000 **domestic heat pumps**. These developments highlight the challenge for network planning, as rapid data centre expansion can outpace grid reinforcements outlined in SSEN's Long Term Development Statement[111].

Figure 28: Projected data centre demand in boroughs served by SSEN



*Data Source: Aggregated data from SSEN Connection Queue (June 2025). *Note: SSEN covers the majority but not all of Hillingdon borough*

Trends and patterns in capacity: electricity networks (UKPN)

Understanding the impact of future growth of data centres on the UKPN distribution network.

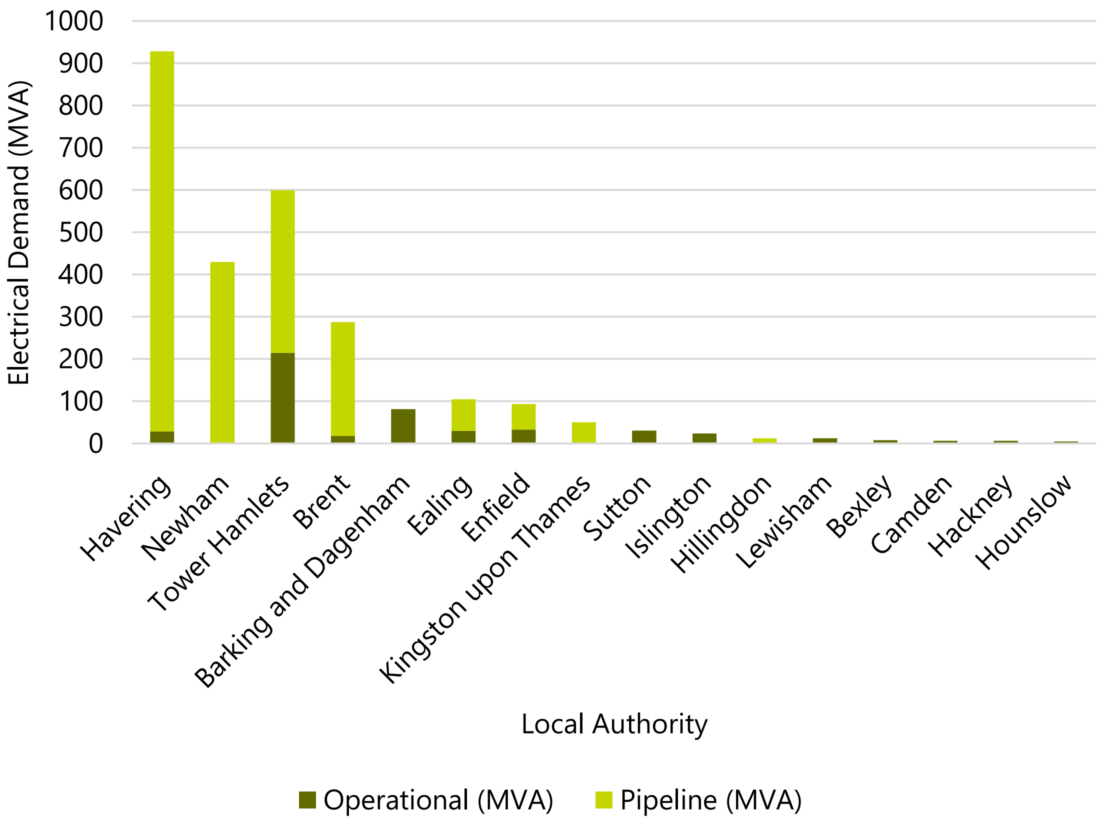
UKPN's Data Centre Insights Report (March 2025) notes there are currently around 95 connected data centres across the UKPN area, with a total capacity of 940 MVA[112]. The pipeline includes 40 new projects totalling 4,350 MVA, **more than four times the existing capacity**. These new sites are significantly larger, reflecting a shift toward hyperscale developments. This surge in demand is placing pressure on the electricity network, particularly due to requests for firm capacity and immediate full-scale connections. Such demands often trigger reinforcement works across both transmission and distribution networks, resulting in connection delays taking longer than expected.

In response, UKPN has published open data on data centre utilisation, load profiles, and a large demand queue to improve transparency and planning[113]. Utilisation data shows that most operational data centres use only a fraction of their contracted capacity, with median usage around 27–36%, suggesting future-proofing or phased build-outs.

Within UKPN's London Power Networks area, there are 50 operational data centres (495 MVA) and a 2,182 MVA pipeline of new projects, with the largest concentration in Tower Hamlets (214.5 MVA). Notably, several boroughs such as **Havering, Newham, and Brent display increased growth ratios.** Havering's pipeline is 900 MVA versus just 28 MVA operational, with 600–700 MVA tied to the Havering Digital Freeport initiative. The growth pattern points to high-capacity developments concentrated in a few strategic locales. UKPN data also reveals new connections being made in boroughs outside its direct DNO area, suggesting that developers are pursuing significant long-distance links to substations elsewhere to secure energization.

Again, the National Grid data shows even greater planned expansion, with 4.39 GW of transmission-connected capacity planned through the same region, far exceeding UKPN's distribution pipeline. This reveals how developers are securing connections directly at the transmission level or via IDNOs, rather than through traditional distribution infrastructure.

Figure 29: Projected data centre demand in boroughs served by UKPN



Data Source: Aggregated data from UKPN Connection Queue (August 2025)

Gas utility providers in Greater London

Understanding the footprint of critical utilities serving London's data centre ecosystem.

Cadent's gas distribution network primarily serves areas north of the Thames, including key boroughs such as Ealing, Barking and Dagenham, and parts of West London. These areas are home to a significant concentration of existing and planned data centres, including sites with interest in gas connections, notably at Park Royal in Ealing and a facility in Barking and Dagenham that already operates a gas turbine

Since early 2025, Cadent has seen **more data centre connection interest than in all previous years combined**, especially in West London and Slough, regions facing electricity constraints and rapid digital infrastructure growth.

Cadent is advancing its **Capital Hydrogen Programme**, with a planned 75 km pipeline entering via East London. Inner boroughs will be reached in later phases, supporting long-term decarbonisation. Hydrogen blending trials (up to **20%**) and **biomethane integration** are also underway, with 43 biomethane plants already connected.

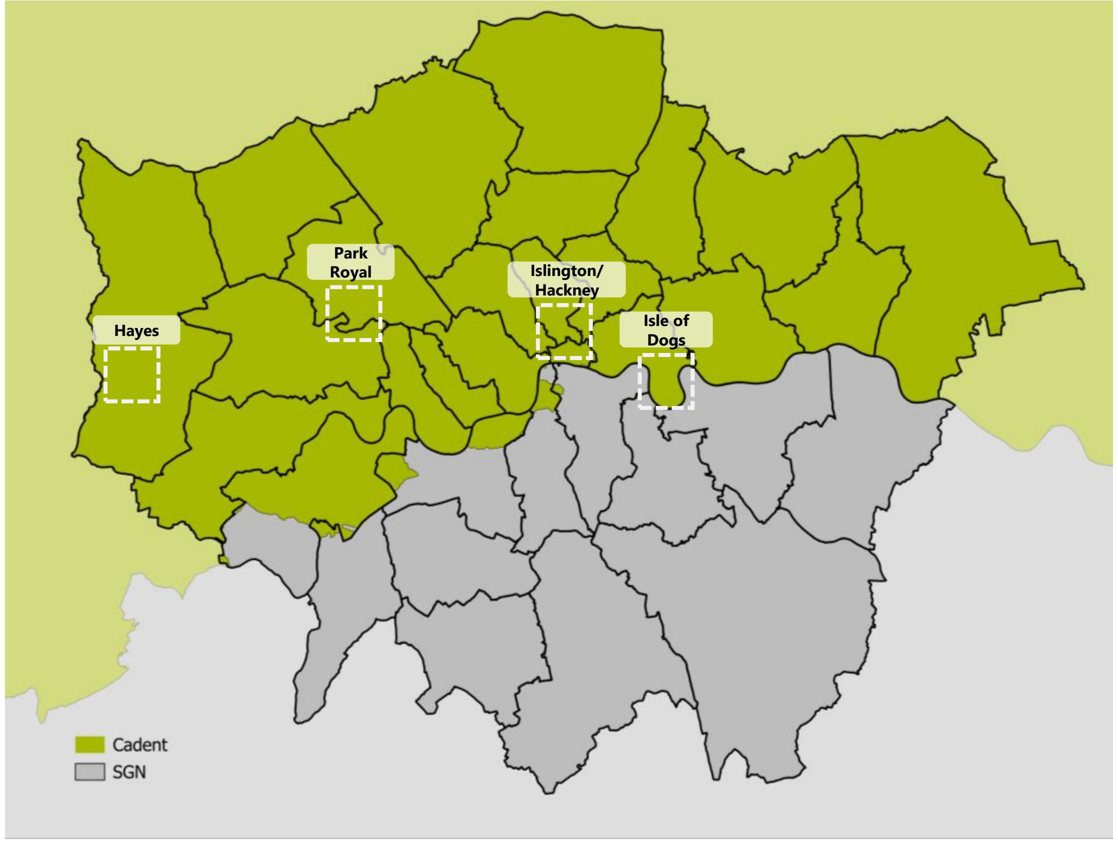
Cadent is exploring Gas Purchase Agreements (GPAs), contracts similar to Power Purchase Agreements (PPAs), allowing developers to supply low-carbon gas through its network, enhancing sustainability credentials for data centres.

SGN operates the gas distribution network south of the Thames, covering boroughs such as Croydon and Bexley. From a data centre perspective, these areas have active planning applications, but SGN's region has historically **seen less concentration of data centre development** compared to areas served by Cadent.

SGN's network is currently less likely to be a primary route for data centre gas connections. However, Bexley aligns with SGN's broader hydrogen strategy, particularly through its inclusion in the Capital Hydrogen Programme, a 15–20 year initiative led by SGN, Cadent, and National Grid Gas Transmission.

SGN have also produced a Data Centre Energy Demand report at the start of the 2025 summer with Wales and West Utilities, examining the role of gas networks in meeting demand from data centres[114].

Figure 30: Map of gas providers in Greater London



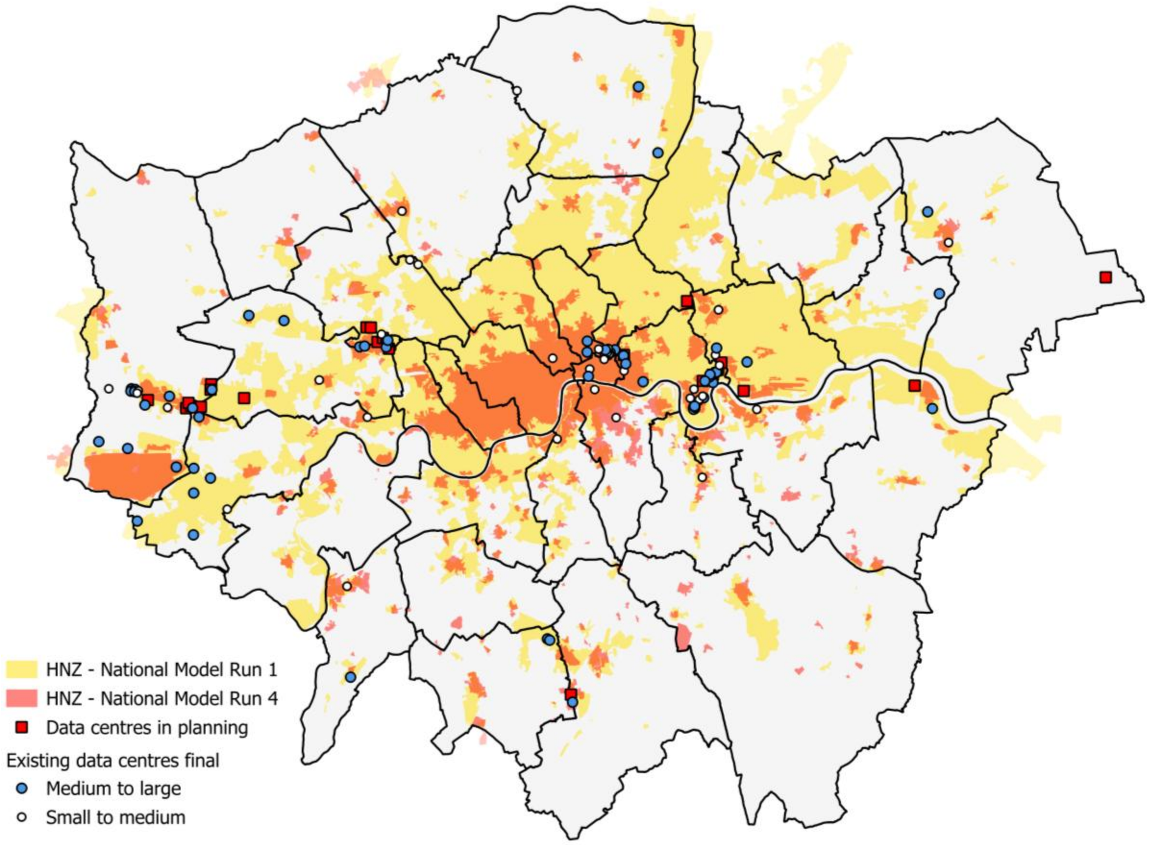
Data Source: Service area data from Cadent's data portal.

Heat network opportunity areas in Greater London

Understanding the footprint of heat network opportunities in the context of data centres

- **Heat Network Zoning Model:** The Heat Network Zoning model is a national initiative led by the Department for Energy Security and Net Zero (DESNZ). It has undergone multiple iterations and continues to be updated. The map displays outputs from two model runs:
  - National Model Run 1, which identified extensive areas across London suitable for heat networks.
  - National Model Run 4, which highlights more spatially constrained zones. Future updates are expected to fall somewhere between these two extents.
- **Significance of Data Centres:** Large data centres can serve as significant sources of low-cost waste heat. The map shows **strong alignment between the major data centre clusters** of Hayes, Park Royal, Islington/Hackney, and the Isle of Dogs, and the zones identified in both model runs. All data centres currently in planning are located within or adjacent to these heat network zones. The London Heat Map also captures other waste heat sources but places particular emphasis on the opportunities presented by data centres[115].
- **Opportunities and Challenges:** In designated heat network areas, there is potential competition for electrical capacity between data centres and electrified heating systems. However, if data centres can supply low-cost heat to the network, they may actively support rather than hinder heat network development. Technical challenges, such as space constraints and cooling system compatibility, must be considered early in the planning process. As illustrated on the map, addressing these barriers could unlock **substantial synergies between data centres and heat networks**. The GLA have also recently published a report Optimising Data Centres in London – Heat Reuse which explores these synergies[116].
- **Complexity:** Additional electricity demand will still be required for the heat network when a data centre is connected as a heat source (e.g. heat pumps for uplift in temperature). This has been observed, where data centres are willing to supply heat, but the lack of head room still creates challenges for the heat network development.

Figure 31: Data centres in relation to GLA heat network coverage



Data Source: Heat network areas form the DESNZ Heat Network Zoning model runs 1 and 4.

Summary of findings: energy infrastructure and data centre demand

Navigating diverse forecasting methods, grid investment needs, and planning uncertainties as London's data centre sector expands faster than historic energy infrastructure trends.

Unprecedented growth and scale	Electricity demand from London's data centres is projected to rise sharply, with more than 8 GW of future capacity requests, nearly **ten times above current operational levels,** now in the grid connection queue. This reflects reserved future electricity capacity that is unavailable for other uses, creating significant timeframes for other projects looking to connect in London. This order-of-magnitude increase is unprecedented for the sector, but some of the growth **may be overstated by speculative queuing**, as not all power reservations will necessarily translate into built projects or realised demand.
Infrastructure lags demand	Current and planned network reinforcements are challenged to keep pace with this rapid demand growth, especially as data centres vie for capacity alongside electrification of heating and transport. Further research will need to be undertaken to assess the potential **risk that new grid upgrades may not be sufficient to support both desired data centre expansion, and other sources of demand** in the short to medium term.
Growth in dedicated infrastructure	Data centre demand is leading to construction of large-scale infrastructure **dedicated to providing capacity to data centres** (e.g. Uxbridge Moor substation). Expanding energy infrastructure, such as substations, will require significant additional land, with public sector land holdings and engagement by local authorities identified as potential enablers within urban and peri-urban settings. Data centres also provide an opportunity for waste heat offtake.
Data reliability and planning uncertainty	**Forecasting accuracy for data centre energy demand** is affected by gaps between national scenarios, regional distribution forecasts, and real-time connection requests, with speculative queue activity complicating the interpretation of growth signals. While coordination between forecasting frameworks is improving, uncertainty remains around actual utilisation rates, project completion timelines, and the translation of capacity reservations into operational demand.
Implications for future growth	Future growth will depend on **how effectively London's grid infrastructure can expand and adapt to serve sustained, large-scale data centre demand balanced with broader growth priorities and decarbonisation.** With rising power requirements, planning complexity, and evolving user needs expected to shape site selection, delivery timelines, and market competitiveness. Emerging interest in gas-fired backup and the opportunity to integrate with London's heat networks may provide additional resilience and flexibility for data centres, but these options have operational and policy trade-offs.

Water stress in Greater London and impact of data centre growth

An overview of the scale of the water challenge posed by data centre growth, and the key infrastructure solutions under consideration.

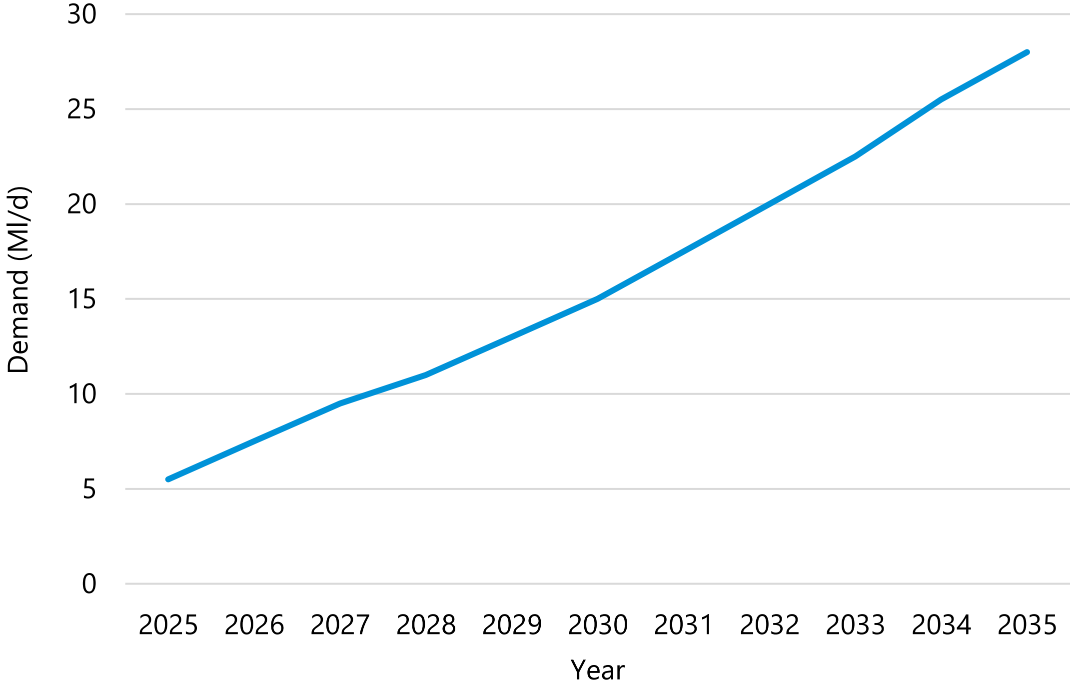
The GLA region, along with much of the Thames Water supply zone, has been classified by the Environment Agency as an **area of serious water stress**[117]. Within this context, data centres are emerging as a significant source of water demand. Thames Water's WRMP24 accounts for an increasing of approximately **28 million litres per day (Ml/d) in** potable water demand from data centres by 2035, compared to 2021/22 levels[118].

These projections are based on assumptions of high reliance on potable water and a 3% annual growth rate in data centre development. In the absence of legislation or consistent early engagement with utilities, developments may opt for water-intensive cooling systems and rely on potable water sources.

Water companies are **not legally obliged to supply Non-Household (NHH) usage**. Although there is **currently no legislation mandating the use of water-efficient cooling systems or non-potable water** in data centres, the updated National Framework for Water Resources (July 2025) indicate that policy development is underway, and industry bodies such as the Government Digital Sustainability Alliance (GDSA) are advocating for regulatory change[51,75].

To address broader supply challenges, large-scale infrastructure projects have been proposed, including in Greater London. While these schemes will increase capacity, they are designed to meet existing forecasted demand. The EA 2025 Future Water Resource report notes that while current plans are expected to meet the projected deficit by 2050, they **do not account for the water needs** of emerging infrastructure such as data centres[119]. Therefore, if rapid data centre growth continues and traditional cooling systems remains prevalent, data centre water use could place **additional strain on an already stretched system**. If future developments adopt efficient cooling technologies or alternative water sources, this could significantly reduce potable water demand. In the absence of legislation, **early engagement with developers** is key to integrating water-efficient solutions from the design stage.

Figure 32: Thames Water Projected Data Centre Demand



Data Source: Data Centre Water Use Profile, Thames Water WRMP24 Section 3

Water utility providers in Greater London

Understanding the footprint of critical utilities serving London's data centre ecosystem.

Thames Water is the primary provider of potable water and wastewater services across the entire GLA and the surrounding commuter belt. Its service area includes key data centre zones such as Enfield, Isle of Dogs, Croydon, making it a central player in supporting London's data centre ecosystem. Thames Water's infrastructure underpins cooling systems, wastewater discharge, and resilience planning for many of the capital's largest facilities, and it supplies **approximately 80% of London's total water demand**, according to the London Strategic Infrastructure Requirements[120].

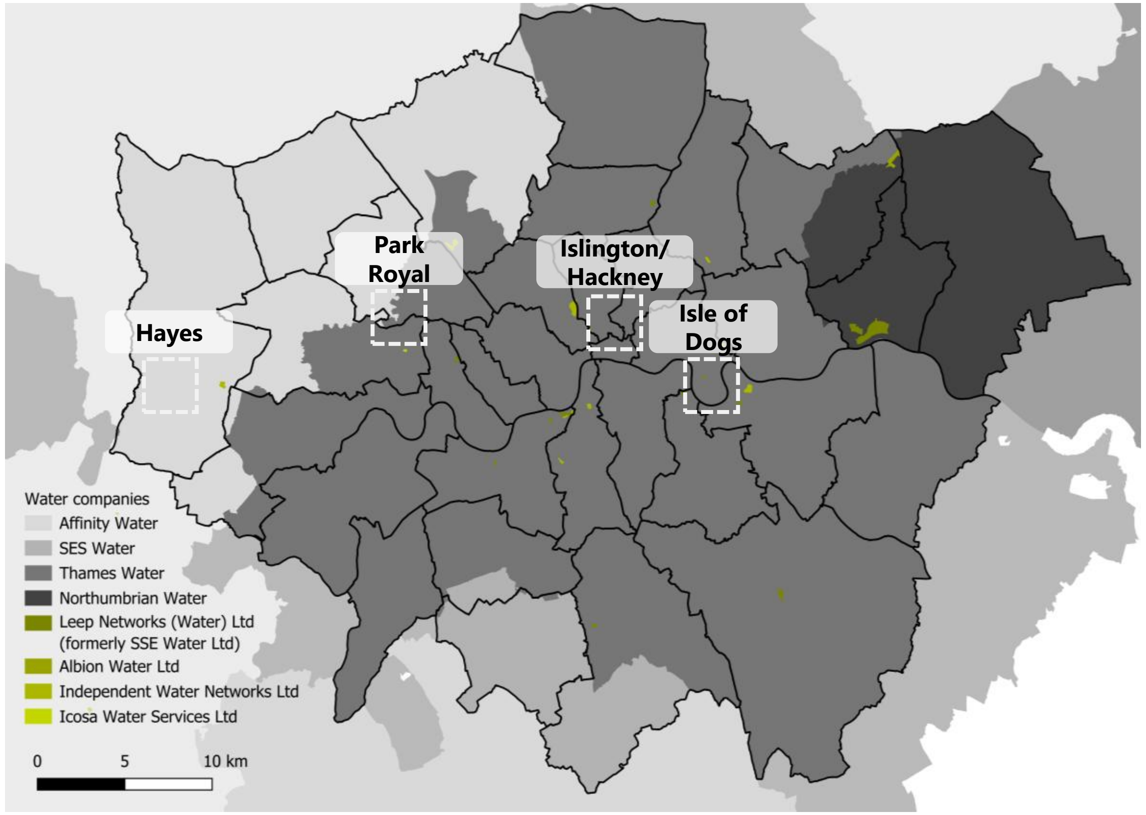
Critical infrastructure operated by Thames Water, particularly the **Beckton** and **Crossness Sewage Treatment Works,** could play an important role in enabling sustainable water use for data centres. Beckton, located in East London, is the **largest sewage treatment plant in Europe** and a potential source of recycled water for industrial cooling. Crossness, in Thamesmead, serves large parts of South and East London and offers similar potential for non-potable reuse.

While both sites are strategically located near major data centre clusters, **neither the Beckton nor Crossness Catchment Strategic Plans explicitly reference data centres** as part of their long-term planning. Nonetheless, their proximity enhances opportunities for integrated planning around cooling, wastewater discharge, and resilience, and supports Thames Water's broader strategy under WRMP24.

Affinity Water supplies ~15% of London's water demand and operates in parts of West London, particularly around key data centre clusters in Hayes, Hillingdon, and surrounding areas. While it is a secondary provider compared to Thames Water, Affinity Water's infrastructure also supports cooling systems, potable water supply, and resilience planning for facilities within its service boundary.

Other water providers with smaller or specialised operations in Greater London include SES Water, Albion Water, and Northumbrian Water (formerly Essex and Suffolk Water). While their footprint is limited compared to Thames and Affinity, they may still support edge or mixed-use data centre developments.

Figure 33: Potable water supply area from water utilities



Data Source: StreamWaterData.co.uk, an Ofwat-approved platform

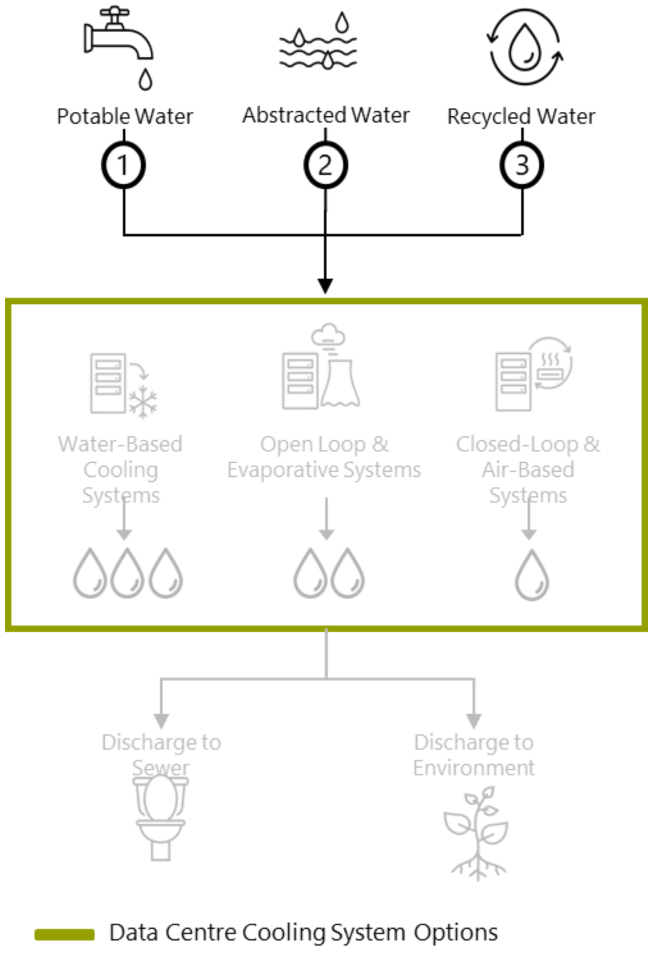
Water supply connections routes in London

Exploring strategic water supply pathways for London data centres amid growing scarcity, regulatory pressure, and sustainability demands

1. **Potable Water and Supply Process:** Potable water is often seen as the **most reliable option for data centre cooling**. Where infrastructure is limited, developers may need to fund upgrades. Developers submit requests based on projected demand, but utilities may decline or impose conditions where capacity is constrained. The 2024 CNI designation of data centres has prompted greater government focus on early engagement, but it does not guarantee water supply.
2. **Abstracted Water and Supply Process:** Surface and groundwater sources offer an alternative to potable water for data centre cooling. To use these sources, developers **must obtain an Abstraction Licence from the Environment Agency (EA),** detailing volumes, source, and environmental impact. The EA assesses catchment availability and ecological impact. While straightforward applications may be processed in around four months, complex or high-demand cases can take longer. The London Abstraction Licensing Strategy categorises catchments by availability and licensing feasibility. Coordination with water utilities is often required for backup supply and wastewater discharge arrangements. This option is being explored by some developers; Equinix has obtained groundwater abstraction licenses for its data centres[121].
3. **Recycled Water and Supply Process:** Recycled water, including treated effluent, greywater, and harvested rainwater, offers a sustainable alternative for non-potable uses such as data centre cooling, helping to reduce pressure on potable water supplies. Didcot Sewage Treatment Works is being explored as a supply source by a developer in partnership with Thames Water. Recycled water is typically sourced from local wastewater treatment plants, and Thames Water is also exploring greywater reuse from urban developments. Early engagement with utilities is essential to confirm availability, treatment standards, and suitability for reuse in cooling systems.

While **potable water** remains the dominant source due to its reliability and lack of regulatory pressure to use alternatives, **non-potable sources** such as **abstracted** and **recycled water** are **emerging options**, with increasing interest but limited current adoption.

Figure 34: Flowchart of water and cooling types for data centres



Water cooling technologies and discharge routes in London

Understanding the range of water-based cooling technologies and the associated wastewater discharge routes shaping data centre development across London.

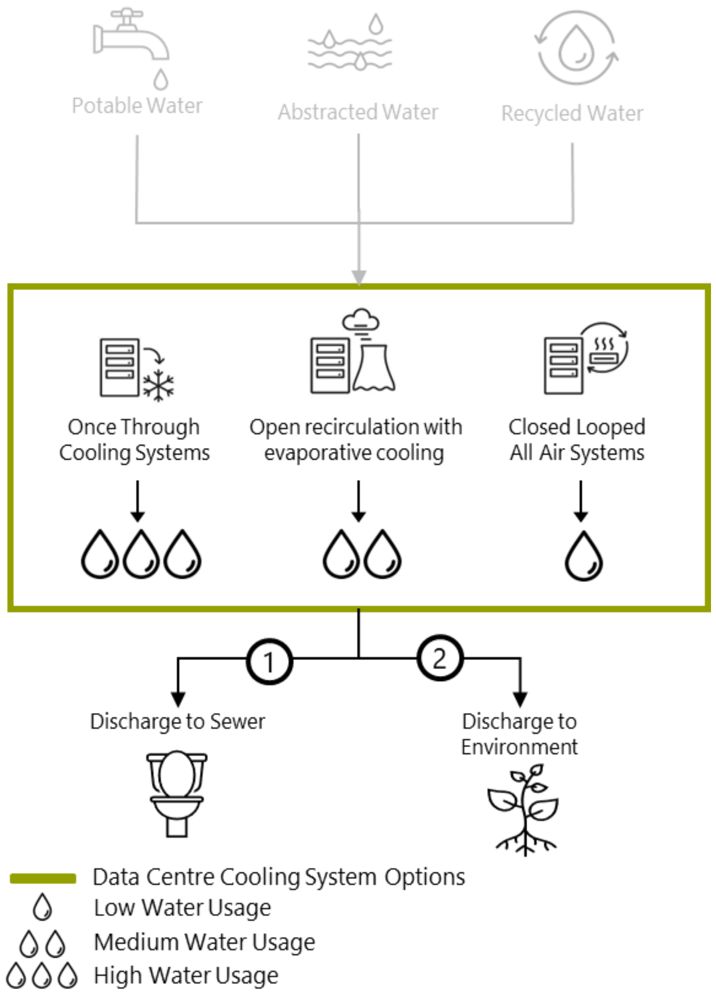
Cooling Technologies: techUK's 2025 industry survey, covering 73 data centres in England (~15% of the national total), indicates a shift towards lower water use systems[122]. Over 51% of the surveyed sites used waterless cooling, 38% relied on hybrid systems.

- **Minimal water use:** Closed-loop all air systems, including air-cooled chillers, dry coolers, and closed-loop geothermal setups, require only small amounts of water (mainly for occasional top-ups).
- **High water use:** Open recirculation with evaporative systems, such as open-loop cooling towers and fluid coolers (with or without chillers), recirculate water for heat rejection but lose moderate to high volumes through evaporation.
- **Very high water use:** Once-through systems (e.g., single-pass heat exchangers, or direct abstraction from rivers, lakes, or groundwater) have the highest water demand.

1. **Discharge to Sewer Route:** Wastewater from cooling systems is **typically discharged** into public sewers. This is classified as trade effluent, which excludes domestic sewage and uncontaminated rainwater.
    - Developers must obtain a Trade Effluent Consent from the local water company.
    - The application must detail the type, volume, and characteristics of the discharge.
    - Water companies assess the impact on sewer infrastructure and treatment capacity.
    - Pre-treatment may be required to meet discharge standards.

2. **Discharge to the Environment Route:** However, **some data centres** discharge treated water directly into surface water bodies (e.g. rivers, lakes) or into the ground. This route is typically used for clean or lightly treated cooling water.
    - A Discharge Permit must be obtained from the Environment Agency (EA)
    - Applications include water quality, discharge location, and environmental impact.
    - The EA conducts an assessment to ensure no harm to ecosystems or water quality.
    - Typically process in four months, but high-demand applications may take longer.

Figure 35: Flowchart of cooling technologies for data centres



Non-household water demand forecast

Overview of forecasted Non-Household Demand from Thames Water and Affinity Water.

Non-household (NHH) water demand in the Southeast is steadily increasing, driven by **expanding business activity** and the **emergence of new sectors such as data centres**.

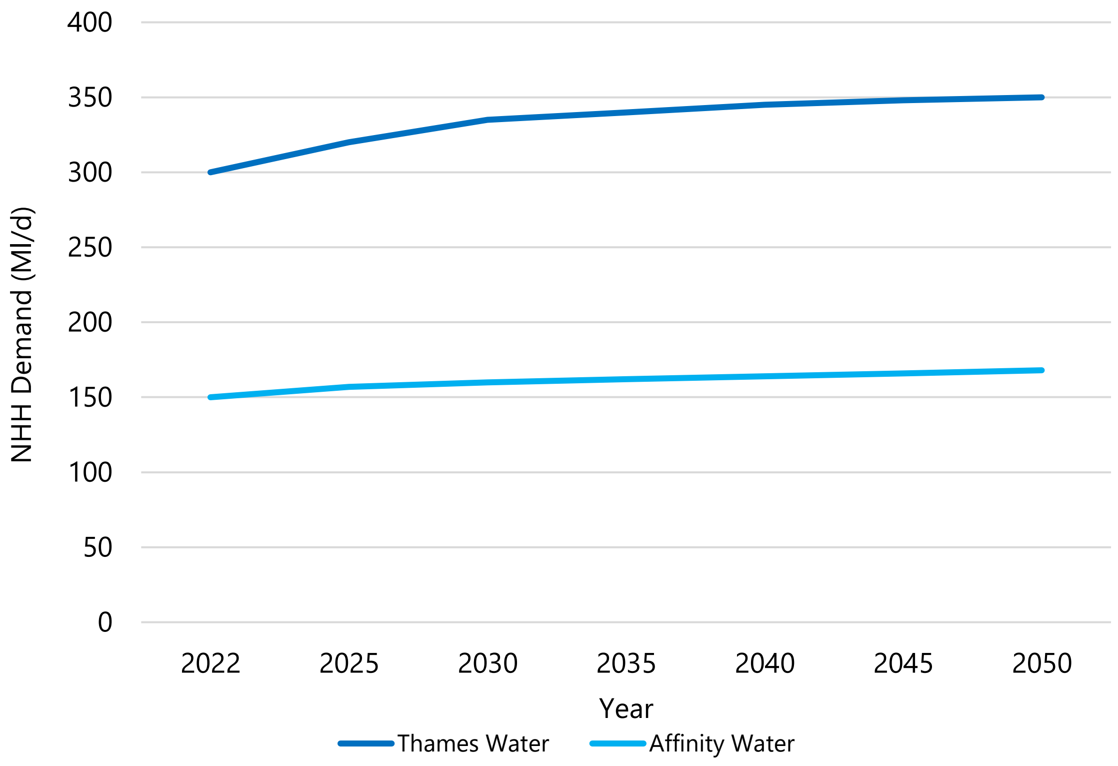
Thames Water: Thames Water, Water Resources Management Plan 2024 projects non-household (NHH) demand to rise from 300Ml/d in 2022 to 340Ml/d by 2035, an **increase of 13.3%**[123]**.** A large share of this growth is attributed to data centres, which alone are expected to add about 28Ml/d to demand by 2035. Thames Water has adopted a measured, scenario-based approach, reflecting a mid-point between low and medium data centre growth forecasts (3%), informed by the 2022 study. The company notes that demand growth beyond 2035 is expected to level off.

Affinity Water: While the Affinity Water, Water Resource Management Plan 2024 does not specifically detail how data centre growth is factored into its NHH demand forecasts, the projections show a gradual increase in NHH demand from 157Ml/d in 2025 to 168Ml/d by 2050, representing **a 7% increase**[124]. This steady growth is attributed to a broad range of commercial and industrial users, rather than any single sector.

Strategic Outlook: Both Thames Water and Affinity Water are planning for higher non-household water demand in the context of regional water stress and changing business needs. The Environment Agency's 2025 Future Water Resources report identifies business growth, as a key driver, contributing 144Ml/d to the forecasted national shortfall by 2050[119].

However, this may understate future demand, as it does not fully account for emerging sectors such as data centres and energy infrastructure. This **reinforces the need for flexible, scenario-based planning**, noting that while data centres contribute to rising demand, **efficiency improvements and cooling innovation** are likely to moderate long-term water use.

Figure 36: Combined Non-Household (NHH) water demand



Data Source: WRZ NHH Demand Totals from Thames Water Resources Management Plan 2024 and Forecast total, measured and unmeasured annual average NHH consumption from Affinity Water Resource Management Plan 2024.

Forecasted data centre water for the Thames Water region

Overview of the forecast model commissioned by Thames Water to project data centre water demand to 2035.

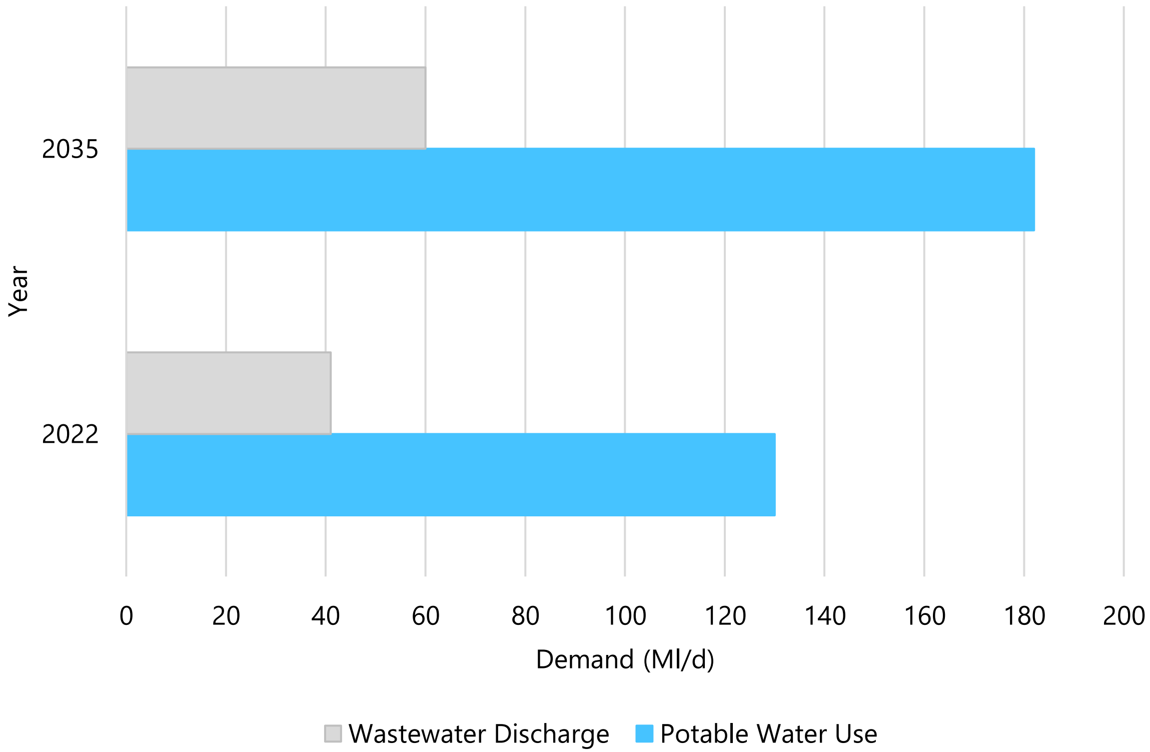
In 2022, Thames Water commissioned a study to assess the current and future potable water demand and wastewater discharge from data centres in its region.

- In 2021/2022, data centres used an estimated 130Ml/d of potable water, about **5% of Thames Water's total potable demand.** By 2034/2035, usage is projected to rise to 182Ml/d (**about 7% of the total**), representing a **40% increase.**
- Wastewater discharge is also expected to rise significantly, from 41Ml/d in 2022 to 60Ml/d in 2035, a **46% increase** over the same period.
- These forecasts assume continued reliance on traditional evaporative cooling systems, which require large volumes of potable water and generate substantial wastewater.

Key considerations:

- If new data centres continue to adopt water-efficient or alternative cooling technologies, or use non-potable water, both **demand and discharge could be lower than forecasted.**
- However, forecasts **still often assume traditional systems remain the norm**, and changes are unlikely without stronger policy signals or incentives.
- If sector growth exceeds expectations and reliance on water-intensive cooling persists, actual water use and wastewater discharge **may surpass these projections**.
- Thames Water's planning assumes **an annual NHH growth rate of 2–6%,** reflecting both existing and projected data centres in its area.
- These projections illustrate the growing impact of data centres on water resources and highlight the need for ongoing monitoring, innovation, and engagement with industry to manage demand sustainably.

Figure 37: Data centre peak potable water demand (Thames Water)



Data Source: Thames Water Data Centre Water Use Review 2022

Future water infrastructure development

Overview of the proposed Water Infrastructure Developments affecting Greater London.

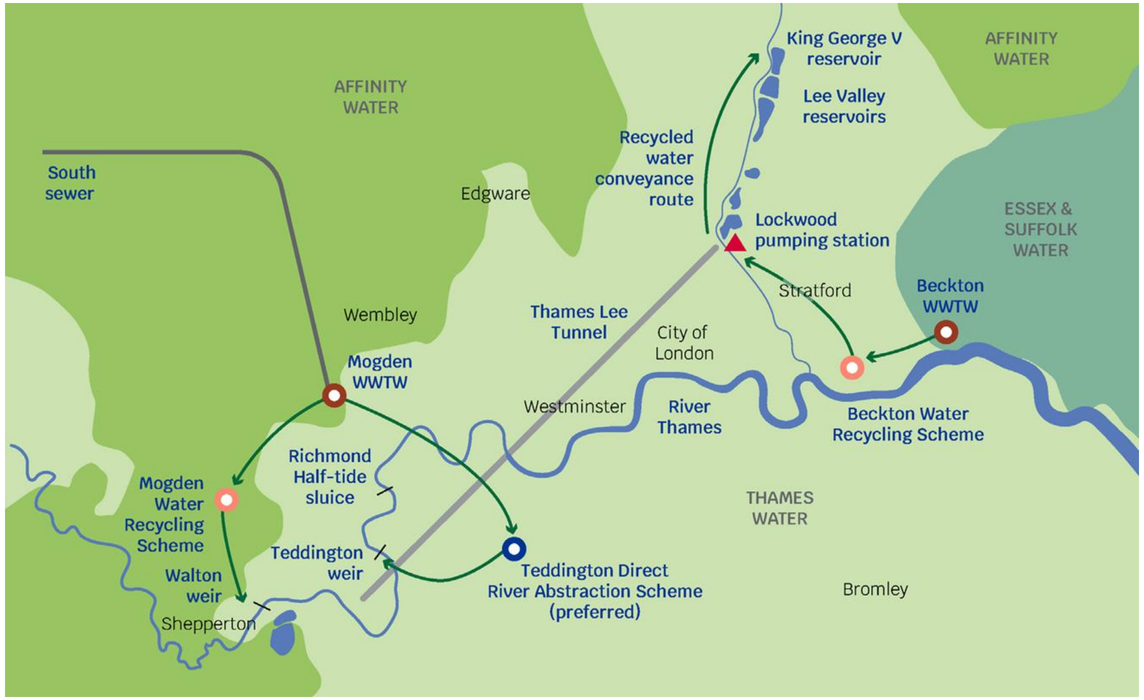
By 2050, across England the gap between sustainable water supply and projected demand could reach **nearly 5 billion litres per day**[125]. Reducing consumption, and leakage are expected to address ~65% of this deficit, and the **remaining requires large-scale infrastructure investment**.

The Ofwat Major Project Guide for the Supply Chain 2025 outlines 30 strategic infrastructure schemes planned for delivery over the next 15–20 years[126]. Several of these have direct, strategic implications for Greater London:

- **Teddington Direct River Abstraction (2028 Planned Start of Construction):** This scheme proposes the abstraction of up to 75 Ml/d from the River Thames upstream of Teddington Weir, with the water transferred to the Lee Valley Reservoirs. It is positioned as an alternative to the Beckton Water Recycling scheme.
- **Lower Thames to West London Reservoir (2030 Planned Start of Construction):** This scheme involves the conveyance of raw water extracted from a new abstraction point on the Lower River Thames at Surbiton to the Queen Mary Reservoir. The reservoir is located in the Borough of Spelthorne, bordering Hounslow and Hillingdon. The Queen Mary Reservoir, owned by Thames Water, is one of the largest in London and supplies fresh water.

While major new schemes will boost water security in the GLA, they are largely designed to close the currently projected supply-demand gap, and do not fully account for the water needs of emerging infrastructure such as data centres. If data centre growth accelerates, particularly with ongoing use of water-intensive cooling, demand could again outpace available capacity.

Figure 38: Proposed water infrastructure development



Source: Major Water Infrastructure Projects, Ofwat Major Project Guide

Summary of findings: Water supply, risk, and resilience in London

How coordinated planning, technology choices, and supply management are shaping the response to water stress, future drought risks, and data centre infrastructure needs in London.

Rising water demand in a stressed system	Greater London sits within one of the UK's most water-stressed supply zones, with **non-household consumption increasing in line with data centre growth.** Thames Water's projections indicate demand from data centres could rise by around 40% by 2035, against a system already under supply pressure from urban population growth and climate-related variation.
Disparity between water and energy growth forecasts	Thames Water's Resource Management Plan accounts for an increase in data centre demand of ~ 28 million litres per day by 2035. The scale of energy demand currently in grid connection queues, exceeding 8 GW, suggests that the sector may expand at a much faster rate than projected. This difference suggests that **water demand may be significantly underestimated** if water demand accelerate in line with energy trends. However, as stated in their Resource Management Plan if Thames Water considers a non-household customer's water use to be inefficient; it reserves the right to refuse supply and require improvements in efficiency. This implies that Thames Water is relying on developers to adopt more efficient practices to reduce future water demand.
Cooling technology as a key variable	The Thames Water commissioned study **assumed a continued reliance on traditional evaporative cooling**, which drives higher potable water use and discharge. Broader adoption of closed-loop, hybrid, or air-based systems could substantially moderate demand growth, but these technologies remain inconsistently deployed across London's existing sites.
Water infrastructure upgrades planned, but not data centre-specific	Major infrastructure schemes, including the Beckton Water Recycling Project and Teddington Direct River Abstraction, will strengthen long-term water security but are designed to close the currently projected supply-demand gap and **do not fully account for the needs arising from very rapid or regionally concentrated data centre growth**.
Implications for future development	Implications for future water planning will depend on early and **close coordination with data centre developers** to integrate efficient cooling technologies and alternative supply options. An additional emerging consideration is how the designation of data centres as Critical National Infrastructure (CNI) **might affect their water supply priority during drought**, raising strategic questions about risk allocation and supply continuity for both existing and future sites under extreme conditions, which will require careful scenario planning in future policy development.

Fibre deployment across London

Overview of the scale of the fibre requirements to meet data centre growth.

Fibre deployment in London is more costly and complex than in other UK regions, due to its dense urban environment, planning requirements, and legacy infrastructure. Although the copper switch-off is expected to begin in late 2025, removal of redundant cabling is typically limited to individual developments. The INCA Spring 2025 market report highlights wayleave negotiations and urban complexity as ongoing barriers, increasing costs and risk for operators[127]. Despite this, investment from alternative network providers (Altnets) has enabled coverage to over half of London premises, though commercial incentives remain strained. The UK fibre market is characterised by the **presence of numerous alternative network providers**, leading to overlapping deployments and infrastructure duplication in some areas. Ofcom's Connected Nations Spring 2025 update outlines regulatory efforts to promote sustainable competition and address inefficiencies[128].

The economic impact of full fibre deployment in London is profound. Estimates in the London Growth Plan show it could boost labour productivity by £22 billion by 2030, with full 5G and fibre adoption forecast to contribute up to £42 billion in gross value added (GVA) to the city by 2035[1]. Enhanced connectivity is supporting both the digital economy and broader economic resilience, unlocking smarter ways of working, enabling next-generation businesses, and expanding remote working opportunities across London. Public-private investment partnerships are targeting gigabit fibre expansion to drive inclusion, innovation, and growth, especially in underserved zones

Planning processes and requirements vary between boroughs, which can contribute to delays and increased complexity in fibre infrastructure deployment. The Greater London Authority's Digital Connectivity Infrastructure Guidance, which has been adopted as London Plan Guidance (LPG), seeks to standardise approaches and support boroughs in delivering reliable digital infrastructure[23]. The GLA guidance encourages borough-wide strategies to reduce connection costs and improve digital access.

At the same time, London's digital infrastructure is experiencing unprecedented demand growth, particularly from artificial intelligence and cloud computing. Data centre IT power capacity is set to rise sharply, with the largest new facilities requiring ultra-dense fibre connections capable of supporting traffic at 400G/800G. This surge in demand underscores the strategic need for reliable, high-capacity networks to power future innovation.

Innovation is at the heart of London's approach. Network providers are exploring creative asset reuse, such as leveraging Transport for London's underground ducts, to accelerate deployments and minimise urban disruption. The city is also a pioneer in quantum-secure fibre networking, with recent trials safeguarding financial and critical services between leading data centres, marking a step toward future-proofing London's digital backbone against emerging threats.

Topographically, data centres cluster in peripheral zones with available land, but the lack of direct, ring-road style fibre routes means that much network traffic must flow through core nodes, raising latency, increasing infrastructure costs, and sometimes creating bottlenecks. Fibre is thus not only the foundation for London's digital leadership in AI and cloud, but also for smart city applications, inclusive growth, and sustained competitiveness as a global technology hub.

Fibre connectivity in London

A typical pathway from ocean to desk.

1. **Subsea Cable Landing Station:** Armoured fibre-optic cables on the seabed carry all international traffic to and from the UK. At coastal landing stations, optical repeaters and power feed equipment connect to terrestrial long-haul networks.

2. **Carrier Interconnect**: A connection point allowing carriers to access subsea cable capacity. Hyperscale data centres may connect directly to reduce latency for international traffic.

3. **National Fibre Backbone:** From landing stations, traffic enters national fibre backbones connecting major cities alongside highways and rail links.

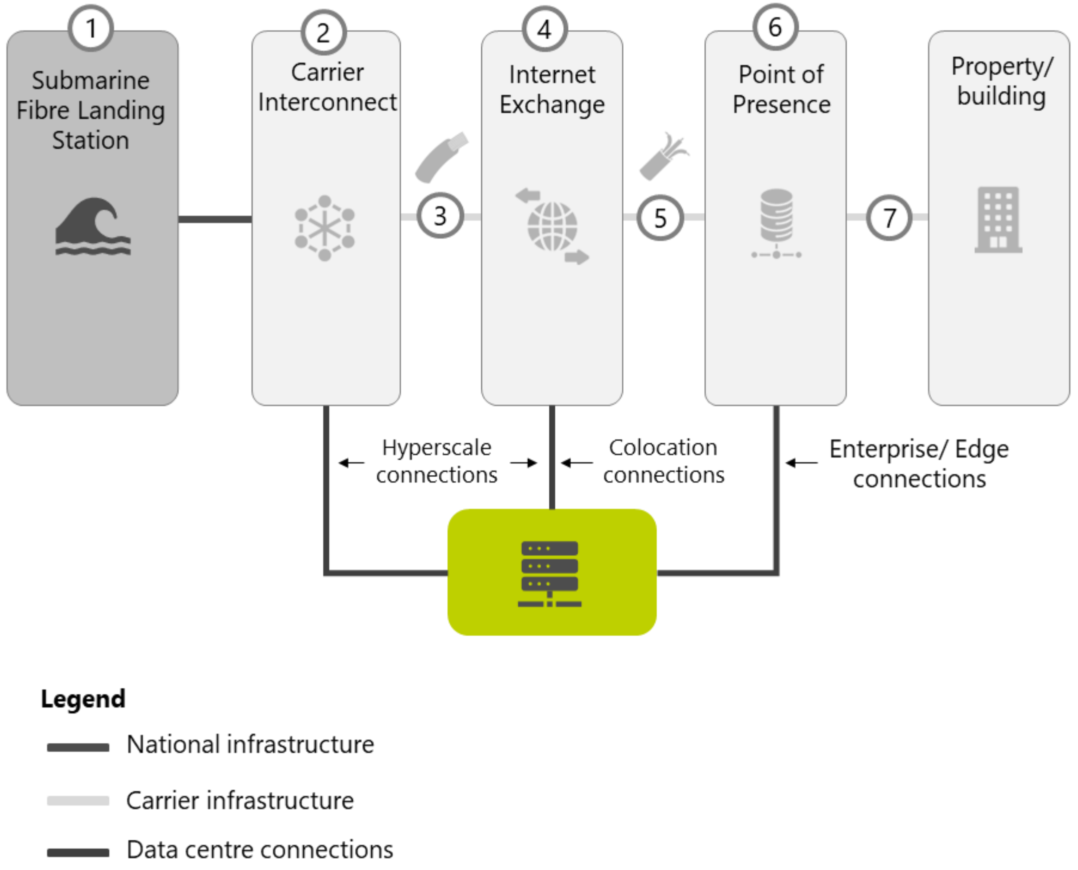
4. **Internet Exchange:** These facilities act as carrier-focused data centres, interconnecting national and metropolitan fibre networks. Most data centres seek direct fibre links to multiple exchanges. Key London initiatives include:
    - **Telehouse London Docklands:** A major interconnection hub where over 1,000 internet companies exchange traffic.
    - **London Internet Exchange (LINX):** A peering agreement enabling ISPs, content providers, and cloud platforms to exchange traffic directly, bypassing third-party transit.

5. **Metropolitan Area Fibre Network:** Dense fibre rings in urban areas link exchanges, data centres, and carrier hotels, providing handoff points for ISPs and enterprises. Carriers design diverse routes (e.g. separate ducts or bridges) to minimise single points of failure.

6. **Point of Presence:** smaller network hubs that connect metropolitan fibre networks to local access networks. They serve as regional interconnection points for ISPs, carriers, and enterprises.

7. **FTTP/Ethernet Fibre:** This refers to the final leg of the network that delivers high-speed internet directly to homes and businesses.

Figure 39: A Contextual View of London's Fibre Landscape



Key fibre providers in Greater London

London's evolving fibre landscape supports a diverse and competitive digital infrastructure ecosystem.

The London data centre market is highly interconnected and strategically positioned at the heart of global digital infrastructure. While BT Group and Virgin Media O2 remain dominant players, London is experiencing rapid growth in alternative fibre providers such as Hyperoptic, and Community Fibre. This evolving landscape fosters a competitive ecosystem with diverse connectivity options, pricing models, and service tiers for data centre operators. London has a high number of multiple network types, local, national and international, which makes it attractive for data centre deployment.

National Incumbent Operators

Providers: BT/OpenReach/EE, Virgin Media/O2, Vodafone/Three

They operate national fibre backbones, metropolitan fibre networks, and last-mile FTTP and Ethernet services. These incumbents also maintain a strong presence at internet exchanges and carrier interconnect points, making them foundational to the UK's digital infrastructure. Their scale and legacy assets make them the default choice for many enterprise and wholesale connectivity needs.

European Regional Specialists

Providers: Colt Technology Services, euNetworks, and Zayo

Focus on high-performance fibre networks across the UK and continental Europe. They specialise in dense metropolitan fibre rings, national backbone routes, and direct connections to data centres and exchanges. Known for flexibility and speed of deployment, these providers are often chosen by enterprises and carriers seeking scalable, high-bandwidth solutions with strong regional coverage.

Global Tier 1 Carriers

Providers: Cogent, Lumen, NTT, Verizon, and Vodafone

These providers operate global IP transit networks and own or lease subsea cable systems. They offer high-capacity, low-latency international connectivity and are key players in subsea landing stations and long-haul fibre routes. Their presence at major internet exchanges and carrier hotels enables seamless global data transfer, making them essential for data centres with international reach or hyperscale requirements.

Alternative network providers (Altnets)

Providers: Hyperoptic, G Network, Vorboss, ITS Technology and Community Fibre

Represent the new wave of fibre infrastructure providers in the UK. These alternative network providers (Altnets) are rapidly expanding FTTP and Ethernet coverage, particularly in urban and underserved areas. They build and operate metropolitan fibre networks and local Points of Presence (PoPs), offering competitive alternatives to incumbents. Their focus on innovation, speed, and affordability is reshaping the UK's last-mile connectivity landscape.

Note: A key challenge across all provider types is the **lack of coordinated "as-built" infrastructure data**, which complicates planning and deployment. While this can increase costs and uncertainty, it also fosters innovation and competition by encouraging providers to develop new approaches to network design and delivery.

London's fibre future

Strategic infrastructure projects across the GLA are laying the digital foundations for AI-ready data centres, smart city services, and resilient connectivity, positioning London as a global leader in fibre-powered innovation through 2050.

Data centre capacity is projected to grow significantly in the coming years, brining with it an increasing need for scalable, high-capacity fibre networks. Within Greater London, this demand is reshaping infrastructure priorities, **with fibre is now recognised as a critical utility**, essential for powering the next generation of data centres. The GLA's 2025 London Infrastructure Framework (LIF) refresh calls for **coordinated digital planning, targeted investment in full fibre, and upgrades to both grid and connectivity infrastructure**.

These efforts go beyond improving public access, they are about enabling London to host and scale large-scale data centres within its boundaries. By unlocking strategic digital corridors and deploying dense, low-latency fibre networks, London's data centre ecosystem is well positioned to support future development and maintain its competitive edge in the global digital economy.

Two major developments are currently underway which highlight the need for coordinated infrastructure planning, as called for by the GLA's infrastructure framework refresh.

At the Royal Docks, **Ada Infrastructure** is delivering a 210MW AI-ready data centre campus, featuring three hyperscale buildings and advanced fibre connectivity. Meanwhile, in Romford, **Green Mountain's LON-East campus** is expanding to 30MW, with 13.6MW going live in 2025. Engineered for high-density AI and HPC workloads, the site offers sub-millisecond latency and direct access to over 10 fibre providers, positioning East London as the city's new frontier for data centre growth.

Fibre Infrastructure Projects in London

1. **TfL Connected London Fibre Backbone**[129]**:** Transport for London's Connected London programme is delivering one of the most ambitious fibre infrastructure projects in the UK. Through a 20-year partnership with Boldyn Networks, TfL is deploying over 2,000km of fibre through its underground tunnels and ducts. This backbone connects borough buildings, CCTV networks, and supports continuous 4G/5G coverage across the Tube. It also lays the groundwork for future edge computing and quantum networking, making it a foundational asset for London's smart city and data centre ambitions.

2. **Hollow-Core Fibre Trials**[130]**:** BT and Lumenisity are piloting hollow-core fibre technology in London, which offers significantly lower latency than traditional fibre. Expected to enter commercial deployment by 2030, HCF will support hyperscale interconnects, financial services, and quantum-secure communications. Its integration into London's fibre backbone will be critical for supporting latency-sensitive workloads.

3. **Quantum Connectivity in the Financial District**[131]**:** London is leading the UK in quantum-secure networking, with BT, Toshiba, and Equinix launching the first metro-scale Quantum Key Distribution (QKD) network. Connecting data centres in Canary Wharf and the Isle of Dogs, designed to protect sensitive workloads and enable secure AI and financial services. City Hall have also seeded £500,000 investment in the new London Quantum Technology Cluster, which will bring together UCL, Imperial College London and King's College London with businesses, communities, government and investors to position the capital as a global hub for quantum technology.

4. **50G Passive Optical Network (PON) Deployment**[132]**:** Netomnia and Adtran have launched the UK's first 50G PON deployment in London, offering ultra-high-speed fibre access for enterprise and residential users. This next-generation standard supports terabit-scale services and is engineered for AI-driven applications and smart city integration. It represents a major leap in fibre capability aligned with London's 2050 infrastructure goals.

Summary of findings: London's fibre infrastructure for data centre growth

London's fibre infrastructure is undergoing a critical transformation, driven by growth in AI and cloud services. Fibre is now positioned as a strategic enabler for London's digital economy, requiring coordinated investment and planning to unlock its full potential.

Rising Demand	London's digital infrastructure is experiencing unprecedented demand growth, particularly from artificial intelligence and cloud computing. Forecasts suggest that London's data centre IT power capacity will rise from significantly, with the largest sites requiring the densest and most advanced fibre connections. This rapid expansion underscores the strategic importance of reliable, high-capacity networks to support future workloads.
Policy Alignment	Policy frameworks at both city and national levels recognise fibre as critical infrastructure for the UK's digital future. The 2025 London Infrastructure Framework refresh identifies **digital connectivity as a top priority**, placing it on par with transport and energy[4]. Nationally, the UK Government's Future Infrastructure Review sets the ambition for **nationwide full-fibre coverage by 2033**, positioning fibre as the backbone for fixed broadband, 5G/6G mobile networks, and emerging technologies by 2050[133].
Connectivity Gaps and Investment Needs	Despite progress, **8% of London premises still lack gigabit-capable fibre**, according to Ofcom's latest Connected Nations report[128]. Rollouts have slowed due to higher financing costs and uneven adoption. Both Ofcom and the GLA stress the need for targeted public-private investment, especially in outer boroughs, business parks, and employment zones.
Long-Term Vision: Fibre as a Fourth Utility	The London Infrastructure Plan 2050 had previously set out a vision where **fibre is treated as a "fourth utility," on par with water, energy, and transport[134]**. With London's population expected to exceed **11 million by 2025**, the plan calls for ubiquitous gigabit and terabit connectivity, a full copper switch-off, and deployment of **multi-terabit fibre backbones** to support AI, IoT, and autonomous systems. At the frontier of innovation, the UK National Quantum Technologies Programme is investing over £1 billion to **develop quantum-secure networks** and computing infrastructure, with direct implications for London's data centre ecosystem and long-term fibre evolution[135].
Implications for future development	Operators and market leaders are positioning investment strategies to meet these long-term requirements. **Openreach and Virgin Media O2 are progressing network upgrades** across London's metro routes, business parks, and hyperscale data corridor routes. At the same time, data centre providers such as **Equinix, Digital Realty, and NTT are expanding their east London and Docklands campuses** with ultra-dense fibre connections capable of supporting 400G/800G traffic, ensuring London remains a leading hub for high-capacity digital activity. These investments could also help address connectivity not-spots by extending fibre spurs into underserved areas, leveraging excess capacity, and aligning rollouts with borough-level digital inclusion plans.

Section 7

Growth pathways and infrastructure readiness

This section provides a forward-looking analysis of data centre growth trajectories in London through to 2050, examining the structural dependencies, such as energy availability and land supply, that will shape future development. It leverages national and regional forecasts to assess reliability and relevance, with growth assumptions informed by market predictions and emerging trends to identify long-term capacity needs. Building on these pathways, the section evaluates their potential impact on infrastructure capacity, offering a high-level assessment of constraints and risks under reasonable growth scenarios. The aim is to deliver a strategic risk assessment of how forecasted data centre expansion may affect infrastructure capacity critical to London's broader growth priorities.

The primary factors influencing data centre growth forecasting in London

Energy capacity and land availability are shaping the scale, pace, and location of future development in London.

Primary Focus

- Energy availability and connection capacity
- Land availability in key locations
- Land use/s and planning policy
- Site physical and technical suitability

Secondary Focus

- Water provision and capacity
- Fibre provision and capacity
- Sustainability and environmental constraints
- Building retrofit and existing building condition
- Heat offtake opportunities

Energy availability and connection capacity: As explored in Section 6, Transmission-level and DNO connection queue data remain the central reference point for assessing sector growth potential. Market demand for data centres in London is exceptionally strong, as evidenced by low vacancy rates reported by JLL[136]. However, this demand cannot be realised without sufficient, reliable, and sustainable power. Crucially, energy constraints, particularly in **high-demand areas** where data centres are most likely to emerge**,** such as **existing clusters**, are determining what can proceed, rather than reflecting a lack of investment intent. While grid pressures are present across the city, the most acute limitations are concentrated in zones like West London, where long connection queue lead times are now the most important factor for sector viability. Consequently, power availability has become the primary determinant of future growth.

Land availability, use and suitability: Delivering new capacity depends on securing sites with sufficient power and infrastructure for modern facilities, as retrofitting legacy buildings is becoming increasingly unviable for hyperscale and colocation operators. London's Strategic Industrial Land (SIL) has seen the majority of recent data centre development, particularly within established clusters in West London, as highlighted in Section 3. These clusters **reflect the sector's specific spatial needs, including robust power, advanced cooling, and physical resilience.**

However, as competition intensifies and technical demands evolve, operators are **increasingly considering options outside existing SIL designations** to access suitable sites**, especially emerging in east London.** This includes select brownfield locations, large grid-ready industrial plots, and, with support from recent planning reforms, specific greenfield or "grey belt" land.

Not all growth follows the same pattern. On the Isle of Dogs, for example, expansion is driven by full redevelopment of former office sites rather than industrial conversions. While latency is a factor in this location, data centres in London clearly tend to cluster, **even in constrained areas**. In the short term**, it appears that existing clusters will continue to attract investment and drive further growth.**

While water access, fibre connectivity, and other factors are acknowledged, they are considered secondary to energy and land in the London context. As water companies are not required to meet non-household requests, and fibre infrastructure can typically respond at pace with data centre development, neither is regarded as an effective marker for modelling potential data centre growth in London. Beyond specific sustainability requirements embedded in planning policy, innovations in this space are largely operator-driven, including opportunities for heat offtake. However, these are typically pursued only where a financially viable business case exists.

Understanding how these factors will influence the growth pathways

Building a layered qualitative and quantitative forecast approach to forecast data centre growth to 2050

Growth projections are based on current connection queue trends, which represent the most reliable indicators of future sector demand. The model forecasts energy demand across two horizons:

- **Near term (2025–2038)**, aligned with current available connection queue data.
- **Long term (2038–2050)**, reflecting proposed time horizon of the new London Plan, and utilising FES and DFES forecasts.

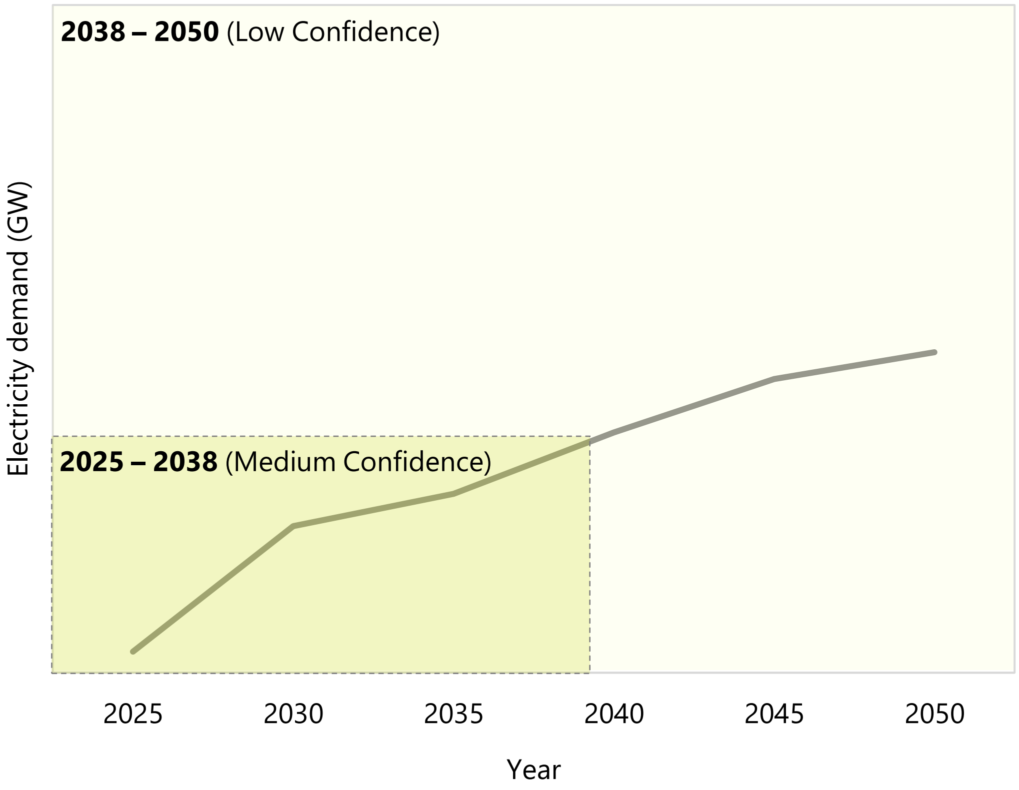
The analysis also includes a qualitative review of key factors:

- Demand drivers: Sector growth outlook, workload intensification, and policy developments
- Supply constraints: Land availability, infrastructure readiness, and policy developments

In the near term, connection dates provides a contract-based foundation for forecasting and provide the clearest signal of genuine market demand. Confidence in the 2025-2038 period is assessed as medium, higher than for the post-2038 horizon, but still subject to uncertainty as speculative developments, ongoing connection reform, and planning outcomes could reshape delivery dates. This limits visibility and introduces variability in near-term projections.

Beyond 2038, confidence is assessed as low due to the sector's rapid evolution, shifting investment dynamics, and the lack of detailed connection queue data. Forecasting becomes more complex over time, as future development is likely to concentrate on purpose-built sites whose scale and location will depend on technological progress, market conditions, and planning reform. These uncertainties limit the reliability of long-term projections and emphasize the importance of adaptive, scenario-based planning that integrates both qualitative and quantitative insights.

Figure 40: Confidence horizons for an example 2050 forecast



Forecasting growth pathways: evaluating energy supply and demand factors

The demand-based energy forecast is built on four interdependent assumptions, each carrying varying levels of uncertainty. The analysis highlights how key assumptions on the connection queue should be used to inform near-term growth (2025–2038) and longer-term projections (2038–2050). connection queue data

Assumption	Detail	Confidence	Qualitative Analysis	Quantitative Analysis Approach
1: Connection queue data reliability	Connection queue data from National Grid and DNO's is currently the most reliable indicator for forecasting market demand and data centre development up to 2038.	**Medium**	The connection queue extending to 2038 provides a **strong snapshot of projected demand,** with over 95% of queued projects having signed agreements. However, progression to operational status depends on factors such as planning approvals *(assumption 5),* Ofgem's imminent reforms *(assumption 2)* and genuine developer intent *(assumption 3).* Overall queue confidence is expected to drop beyond 2030.	Historic year-on-year growth rates could be applied to uplift demand projections, but given rapid market evolution, historical trends may **not reflect future intent**. The connection queue to 2038 represents a '**practical ceiling' for committed capacity.** Any new entrants to the queue are likely to be offset by projects that drop out due to planning, commercial, or strategic factors, resulting in a relatively stable overall demand outlook. The market is experiencing a current surge however and queue data may not be a potentially reliable indicator as market dynamics may change. Projects with longer term timescales may not remain commercially viable and may withdraw and also subject to market take-up of data centre capacity being created. **Decision:** Continue to use the connection queue as a base but apply a more conservative approach to long-term projections.
2. Impact of connection reform	Ongoing grid connection reforms (TMO4+ and new Ofgem measures) will significantly alter sequencing and timing of connections. Connections Reform for Strategic Demand is designed to clear speculative applications and accelerate delivery for high-demand users (e.g., data centres, AI infrastructure)	**Medium**	Ofgem's letter (November 2025) signals an intention to introduce more active, criteria-based management of the demand connection queue, focusing on project viability and maturity. While no formal reforms are in place yet, potential changes could affect which projects progress and the timing of connections.	While the reforms may help reorganise the connection queue and eliminate stalled projects, they do not inherently expand grid capacity or accelerate reinforcement works. **Decision:** No scenario modelling (e.g., accelerated vs base case) of connection reform required. Leverage the existing connection data as the practical ceiling for committed capacity by 2038.
3: Speculative Development	The current pipeline includes a significant proportion of speculative or non-viable projects, particularly among recent data centre applications.	**Medium**	Ofgem's forthcoming reforms are expected to introduce stricter requirements for project maturity and viability, which will likely result in the removal or deprioritisation of speculative or non-viable projects. The pipeline will become more reflective of genuinely deliverable projects, but the current queue likely overstates the volume of projects that will ultimately reach energisation.	The majority of projects in the connection queue have signed agreements, which indicates a baseline level of commitment and suggests that some speculative projects have already been filtered out. However, a proportion of these signed projects are still unlikely to progress to energisation due to factors such as planning delays, commercial reprioritisation, or strategic shifts. **Decision:** No attrition rate is applied at this stage due to uncertainty; signed connections are treated as a practical ceiling for committed capacity.

Forecasting growth pathways: evaluating energy supply and demand factors

The demand-based energy forecast is built on four interdependent assumptions, each carrying varying levels of uncertainty. The analysis highlights how key assumptions on the connection queue should be used to inform near-term growth (2025–2038) and longer-term projections (2038–2050). connection queue data

Assumption	Detail	Confidence	Qualitative Analysis	Quantitative Analysis Approach
4: Energy demand continuity	Assumption that the increase in energy demand from next generation workloads will be balanced by efficiency gains in cooling technologies.	**Medium to High**	Emerging technology trends are expected to sustain strong demand for data centre capacity, as highlighted in Section 1 and 3.	Changes in energy intensity for emerging workloads are already reflected in the connection queue, with major capacity spikes expected over the next five years. Beyond this, in the long term, while workloads increase compute density, these impacts are expected to be offset by improvements in operational efficiency. **Decision:** No additional uplift applied to the base connection data forecast.
5: Grid innovations	Innovation and flexibility measures will unlock additional network capacity and improve demand management.	**Medium**	Approaches such as ramping, participation in flexibility markets, and enhanced data analytics will enable more efficient use of existing infrastructure and may accelerate connections or defer the need for new capacity. These innovations could reduce constraints, improve forecasting, and support more dynamic queue management, but their full impact will depend on implementation and industry adoption.	**Decision:** No quantitative adjustment is made to demand or capacity forecasts to reflect the potential impact of innovation, such as ramping, flexibility markets, or enhanced data analytics. While these approaches may unlock additional capacity or improve forecasting accuracy in the future, there is currently insufficient data to reliably quantify their effect. This approach may be revisited as more evidence emerges from pilot projects, regulatory developments, or industry adoption of innovative practices.

Forecasting growth pathways: evaluating land and planning supply and demand factors

The demand-based energy forecast is constrained by land and planning assumptions, each carrying varying levels of uncertainty. The analysis distinguishes how these supply constraints may inform near-term growth (2025–2038) and longer-term projections (2038–2050).

Assumption	Detail	Confidence	Qualitative Analysis	Quantitative Analysis Approach
6: Availability of Land	Land availability is not expected to constrain delivery of projects currently in the queue (assumed to have secured sites). However, beyond 2038, land scarcity is expected to become a significant constraint on growth, particularly given competition for other uses on industrial land such as logistics.	**Medium to High**	London's constrained geography and competing land uses mean that securing new sites post-2038 will be increasingly challenging. While operators have strong financial capacity and flexibility to repurpose industrial, brownfield, and even green belt land, planning complexity and local opposition could slow acquisition. National policy support and the sector's designation as Critical National Infrastructure will help mitigate these risks, but they cannot eliminate them entirely for urban areas like London.	Focus on post-2038 scenarios to estimate residual land availability (industrial, brownfield, SIL) and redevelopment potential of vacant buildings. Consider the use of **sensitivity ranges** to reflect uncertainty in planning success and land conversion rates. **Decision:** Do not apply a confidence factor to land availability for post-2038 scenarios at this stage. This will be reviewed once spatial scenarios are developed and land availability statistics are finalized.
7: Pipeline Realisation (Planning dependent)	All signed connections currently in the queue receive planning approval and proceed to delivery without major attrition.	**Medium to High**	Recent successful planning appeals, combined with national policy reforms, reflect growing government support for the sector. This shift has strengthened the likelihood of securing planning approval, even when initial applications encounter local resistance, while also considering the role of local community benefits and opportunities, given the significant impacts of data centre developments.	Consider historical planning application outcomes and refusal rates for data centre developments, including appeal success rates. **Decision:** A specific planning attrition factor will not be applied to account for residual planning risk for developments up to 2030. This risk is addressed within the confidence factor outlined in *assumption 2.*
8: National Planning Policy Support	The planning system continues to evolve at the national level to support large-scale digital infrastructure, including reforms that accelerate approval timelines.	**Medium to High**	Recent national policy developments, such as the changes to NPPF and designation as CNI, signal a strong trajectory toward a more supportive national policy environment. This suggests greater stability and consistency in planning decisions, with national-level intervention increasingly able to override local constraints. However, the pace and scope of these reforms remain uncertain, and local implementation could still introduce delays.	At this stage, national planning policy reforms are not expected to significantly accelerate approval processes in practice. Their impact is instead qualitative, providing greater certainty of approval and reducing the risk of refusal or lengthy appeals. **Decision:** No timeline compression or uplift applied to base model.

Forecasting growth pathways: defining a suitable modelling approach

Modelling London data centre growth beyond 2030 and exploring alternative modelling techniques.

The growth model assumes a significant increase in data centre capacity through to 2030, aligned with the current grid connection queue and known large-scale projects such as the Data Freeport in Havering which alone accounts for ~600 MW. Beyond this period, there is greater uncertainty due to market turbulence, policy evolution, and grid constraints. To capture this uncertainty, **three complementary modelling approaches** were applied, *exponential*, *linear*, and *polynomial*, each representing a different set of market and infrastructure assumptions.

Exponential Growth Model – capturing market acceleration: This scenario assumes current rapid growth (as seen in the energy demand queues), fuelled by AI demand and hyperscale expansion, continues without significant interruptions. It is useful for stress testing but tends to overlook long-term constraints such as grid limitations and diverges from national forecasts, likely overstating growth after mid 2030.

Linear Growth Model – illustrating steady, predictable expansion: This model assumes a consistent annual increase in data centre capacity, reflecting a stable market influenced by gradual infrastructure upgrades and ongoing policy support. However, using the 2025–2030 period as the basis of growth may overstate both short-term demand surges from emerging workloads and typologies, as well as cumulative long-term growth, since this window is likely to represent a high rate of expansion that is unlikely to be sustained in subsequent years.

Polynomial Growth – reflecting real-world limits: Grounded in NESO's Future Energy Scenarios (FES), this model applies system-level constraints to reflect London's realistic capacity ceiling, estimated at 60–80% of FES25's national projection. This range accounts for spatial, grid, and planning limitations, aligning with policy outlooks. Ofgem's recent Demand Connections Update highlights that the surge in demand connection applications poses risks to timely delivery and grid stability, reinforcing the importance of realistic planning assumptions[44]. Considering this, the polynomial scenario provides a realistic upper limit for London's capacity outlook.

Data Centre Forecast Model Approach

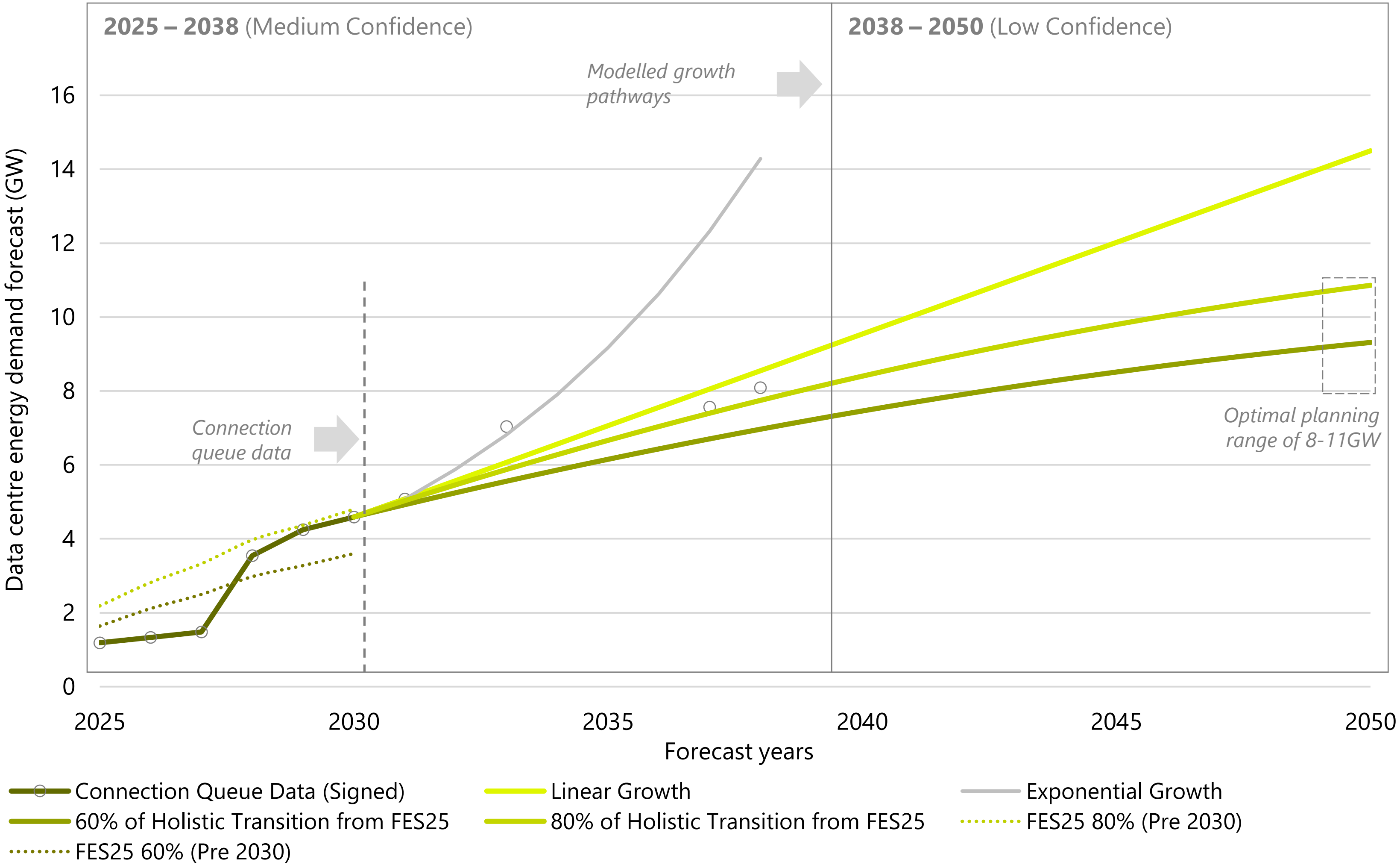
Connection queue	Longer-term modelling
The near term of the model is based on connection demand data from National Grid (transmission-level), UK Power Networks, and SSEN (distribution-level). Energy demand growth in the region is assessed with medium-high confidence, as it is driven by signed connections, evidence that land and energy capacity have been secured to support these developments. These datasets forms the foundation for the modelling techniques applied from 2030 onwards.	**Exponential Growth:** The 2025-2030 data was used to fit an exponential growth model, whose growth rate has been applied from 2030. This captures the increasing demand for data storage, processing and compute power but does not capture restrictions such as the failure of Moore's Law, which will require racks to increase in footprint to increase power density[137]. **Linear Growth:** The 2025-2038 data was used to determine a linear growth rate, which has been applied from 2031, which is the end of the continuous queue data. **Polynomial Growth:** The 2025-2038 data was used to fit a 2nd order polynomial, taking the NESO FES energy pathways into account, following curve characteristics and projected ceilings.
2025 - 2030	**2030 - 2050**

Appendix 1C provides a more detailed view of the connection data underpinning this analysis.

Forecasting growth pathways: modelling London data centre growth to 2050

Each long-term modelling approach highlights key insights and the importance of identifying optimal window of sustainable growth for London's context.

Figure 41: Energy demand growth pathways for data centres to 2050



Exponential: This exponential model represents the theoretical upper bound for data centre electricity demand by highlighting the sector's possible growth if current industry trends were allowed to grow unchecked.

Linear: This model aligns well with current connection queue data through 2038 but likely overstates peak demand by 2050, amplifying the effect of recent AI-driven surges. Ofgem's latest update signals significant uncertainty in long-term queue projections.

Polynomial: The Holistic Transition energy pathway in 2025 FES estimates national data centre energy demand at 14.08 GW by 2050. Applying the 80% ceiling and 60% baseline national shares for London gives a **projected range of 9.3 to 10.8 GW by 2050**. An optimal planning target range of 8–11 GW represents a balanced, evidence-based estimate for London's long-term data centre power requirements. However, with National Grid's connection queue for data centres standing at 8.4 GW through to 2038, there remains **a high-level of uncertainty in the FES projections.**

Notably, NESO's 2022 data projected a more conservative peak UK demand of around 4 GW by 2050, underscoring both the accelerating momentum of data centre development and the substantial uncertainty in long-term projections.

2025-2030 Connection Data: The sharp increases in electricity demand projected for 2027 and 2030 reduces confidence in extrapolated trends, as these temporary spikes may artificially inflate the expected upper bound of future demand.

Energy summary: impact of data centre growth to 2038

Coordinated infrastructure upgrades and smarter energy management are essential to sustain growth while meeting decarbonisation and electrification goals.

By 2050, peak electricity demand from data centres alone could reach 9–11 GW, equivalent to roughly a **quarter of London's total projected grid requirement and enough to power several million UK homes**. This is not just a question of power availability. As load density intensifies, system flexibility and emissions balancing become critical.

Risk Type	Summary of existing landscape	Potential impact on data centre growth	Potential impacts to broader GLA priorities	Mitigating strategies
Grid Capacity Shortfall	• London's electricity grid is under pressure, particularly in West London • Grid applications are outpacing delivery of the infrastructure investment needed to meet connection expectations • Speculative grid applications, combined with current connection policies, resulting in connection delays. • The clustering of data centres in high-demand zones is intensifying strain on ageing transmission and distribution infrastructure. • These constraints are already affecting connection timelines for broader development, making energy access a critical bottleneck for London's growth.	• **Energy constraints will continue to be a defining factor in the viability** and competitiveness of data centre development in London. • Connection delays, escalating grid access costs, and limited capacity in key zones are slowing project timelines and deterring investment. As a result, developers may increasingly look to emerging areas, for instance Havering/ Barking and Dagenham. • Smaller operators may face exclusion due to financial and infrastructure barriers, while hyperscale players may gain advantages through private grid investment, as seen by average connection sizes • With **grid access now the primary determinant of site selection**, sustainability commitments are being tested by continued reliance on diesel backup generation. Self-supply is also seeing greater interest with anecdotal enquires relating to large scale gas network connection. Energy availability is fundamentally reshaping the geography and viability of digital infrastructure growth. • Flexibility measures like Demand Side Response (DSR) and non-firm connections are becoming essential, but risk-reward trade-offs are intensifying.	• London's energy infrastructure is at a critical inflection point. The electricity grid must simultaneously support the needs of multiple sectors including growth of data centres and housing, while also enabling the electrification of transport and heating to drive decarbonisation. • Local Area Energy Plans (LAEPs) are offering targeted insights into how these growth and decarbonisation strategies interact. They show that even without the recent surge in data centre demand, significant network upgrades are required across the city to meet rising electricity needs. The expansion of data centres will both accelerate and amplify the scale of grid reinforcement needed. • The type of reinforcement also changes under scenarios of high data centre growth. While LAEPs currently emphasise reinforcement at lower voltage levels (such as secondary substations and below), data centres **primarily require upgrades at higher voltages** (primary substations and above). • The paradox is clear: data centres generate significant economic value but consume the zero-carbon electricity essential for wider growth and decarbonisation, creating a tension between growth, sustainability, and equity.	• Resolving London's energy bottlenecks requires a multi-pronged strategy. Accelerating grid upgrades, such as the £35 billion Great Grid Upgrade, should be paired with planning and regulatory reforms that prioritise shovel-ready projects. • For data centres to expand sustainably in London, technological evolution is essential. This includes co-locating with renewable sources, deploying on-site generation and battery storage, and optimising energy efficiency through AI and advanced cooling. • Demand-side flexibility measures, including non-firm connections and load shifting, can provide short-term relief while long-term solutions are developed. • Long-term success depends on **integrated planning, proactive capacity mapping, and aligning infrastructure investment with net zero and inclusive growth objectives**. Integration of Local Area Energy Plans (LAEPs) with DFES and transmission strategies through the NESO supports this alignment. The GLA Datahub furthers progress by improving data accessibility, visualisation, and sharing across stakeholders. • From a carbon targets perspective, there is concern that gas connections are being considered to address delays in grid connections. While most remain at an early exploratory stage, anecdotal evidence suggests an increase in high-level gas connection enquiries in the GLA region.

Water summary: impact of data centre growth to 2038

Water scarcity is emerging as a critical constraint for London's data centre growth, requiring innovative cooling and resource strategies.

Thames Water, Water Resources Management Plan 2024 projects NHH demand to rise from 300Ml/d in 2022 to 340Ml/d by 2035, an **increase of 13.3%**[123]. It is noted that the growth scenario that TW has adopted based on the 2022 study reflects a mid-point between low and medium forecast of **data centre growth of 3%.** This is significantly lower than the magnitude of growth considered in this report. While there is insufficient certainty in the water demand associated with this growth, due to the variation in options for cooling technology and use of potable vs non-potable water, it is anticipated that the increase for potable water demand will be in the order of 100sMl/d.

Risk Type	Summary of existing constraints	Potential Impact on Data Centre Growth	Potential Impacts to broader GLA Priorities	Mitigation Strategies
Water Scarcity	• The Thames Water Resource Management Plan projects an increase of approximately 28 Ml/day by 2035, representing around two-thirds of the forecasted non-household (NHH) growth. • Beyond 2035, Thames Water expects NHH demand to stabilise. • The 2022 Drought Management Plan outlines Levels of Service 1–4, with measures at Levels 1–3 not affecting data centre operations. • However, Level 4 introduces emergency drought orders, including rota cuts (restricted water supply at certain times) and standpipes, which could significantly impact data centres. • Additionally, during severe drought conditions, businesses and industries reliant on abstraction licences may face restrictions, creating further potential risks for data centre operations. • Resource planning spans multiple suppliers (Thames Water, Affinity Water) and requires coordinated strategies for cooling, reuse, and resilience.	• Water utilities currently reserve the right to refuse supply for inefficient non-household use, requiring customers to improve efficiency before service is granted. • This will likely accelerate adoption of advanced cooling technologies and drive investment in water reuse and alternative sourcing for data centres. • If data centre growth exceeds current forecasts, developers will face greater pressure to minimise water demand and demonstrate efficiency gains. • Without early engagement to secure feasible supply agreements, there is a risk of development delays or cancellations if demand is deemed unsustainable. • Government intervention, given data centres' designation as Critical National Infrastructure (CNI), may push utilities to prioritise supply, but could also introduce stricter efficiency mandates and regulatory oversight.	• Current water resource plans may underestimate future demand because they do not fully account for rapid data centre, with energy grid connection queues suggest growth could outpace forecasts, leading to unexpected pressure on potable water supplies. • The risk is that if the potable water supply cannot be increased in line with the increase in demands from new residential housebuilding as well as the rapid increase in data centres, one will need to be prioritised over the other. • In addition, there is ambiguity over the implications of recent changes to policy, such as the designation of data centres as Critical National Infrastructure (CNI), on water supply to data centres in London, particularly under drought conditions. • Increased demand could accelerate the need for major upgrades to London's water distribution network, adding cost and complexity to planning.	• Implementing water-efficient cooling technologies in future data centre developments could significantly reduce potable water demand. • Achieving this will depend on early and consistent engagement between developers and water utilities to confirm feasible supply rates and promote water efficiency. • Similarly, adopting alternative supply options, such as those being explored by Thames Water, including greywater and treated effluent, could further reduce potable water demand. • This approach also requires close coordination with water utilities, for example, to align with local wastewater treatment facilities and establish practical supply arrangements. • Integrate water resilience into planning, including dual-contingency strategies for drought scenarios and alignment with sustainability targets.

Fibre summary: London's fibre opportunity: anchoring global connectivity

Empowering growth, innovation, and digital leadership through investment in international connectivity and data infrastructure.

London's data centres are critical hubs for international connectivity, hosting major internet exchanges and offering carrier-neutral interconnection for global data flows. Their strategic location and advanced infrastructure attract significant investment, reinforcing London's role as a digital leader in finance, tech, and AI. With operators increasingly investing in subsea cable routes, London's position as a focal point for hyperscale and AI-ready facilities strengthens its global competitiveness.

Opportunity Type	Summary of existing landscape	Potential impact on data centre growth	Potential impacts to broader GLA priorities	Enabling strategies
Leveraging expanding investment of international connectivity by large data centre operators to position London as a global digital hub.	• Tech giants like Google, Amazon, Microsoft, and control over 70% of global subsea cable capacity, shifting the balance from telcos to cloud-driven ecosystems[149]. • These operators own or co-own dozens of transoceanic cables, enabling direct, high-capacity routes between major markets. *Example*: Google's **Grace Hopper cable** connects the US, UK, and Spain with **352 Tbps capacity**, improving resilience and latency for critical workloads. • Control of physical fibre routes gives hyperscalers unmatched leverage in shaping international connectivity, cloud adoption, and AI infrastructure.	• **London's Strategic Advantage:** International connectivity via hyperscale-owned subsea cables and diverse fibre backbones positions London as the default choice for latency-sensitive, compliance-heavy workloads such as AI, cloud, and high-frequency trading. • **Confidence Through Continued Investment:** Multi-billion-pound commitments from hyperscale operators signal long-term confidence in London's digital infrastructure and reinforce its role as Europe's leading data hub. • **Ecosystem Expansion:** Growth will extend beyond hyperscale campuses to edge nodes, interconnection hubs, and carrier-neutral facilities across London, creating a resilient and distributed network.	• Bolsters London's role in digital innovation, financial services, and AI, aligning with GLA's economic growth and job creation goals. • Addresses digital inclusion by enhancing connectivity for underserved communities and attracting new investment to growth corridors like East London • Facilitates low-carbon connectivity and smart infrastructure by replacing energy-intensive legacy networks with high-efficiency fibre, reducing emissions from data transmission, and enabling digital solutions that support Net Zero goals. Fibre's role in powering smart grids, IoT, and edge computing strengthens London's position as a sustainable, future-ready city.	• Continue to treat fibre as a core infrastructure priority in planning frameworks • Foster partnerships with international connectivity investors to anchor new developments in emerging boroughs • Champion equitable connectivity strategies to maintain resilience and inclusiveness across Greater London. • Accelerate deployment of strategic projects: TfL Connected London backbone, hollow-core fibre trials, quantum-secure networks. • Encourage co-location of fibre infrastructure with energy upgrades and industrial land intensification. • Promote carrier-neutral meet-me rooms and diverse routing to reduce latency risks.

Summary of findings: Strategic challenges for London's data centre growth

Rising demand, grid constraints, and resource interdependencies underscore the need for integrated planning, resilient infrastructure, and coordinated policy to secure London's digital future.

Demand growth is outpacing existing forecasts	Projected electricity demand for London's data centres is rising significantly faster than previous national and regional forecasts, with the steepest growth expected before 2038 due to the rise in AI and cloud services. Current connection queue data and modelling pathways indicate a sharp near-term increase, while confidence in projections declines beyond 2038, due to uncertainty in technology evolution and policy reform. This acceleration underscores the need for proactive infrastructure planning and adaptive strategies to manage both short-term capacity pressures and long-term variability.
Grid Access Will Be a Critical Bottleneck for Data Centre Growth	Energy constraints will continue to be a defining factor for the viability and competitiveness of data centre development in London. Grid connection applications are already outpacing network forecasts and infrastructure delivery, leading to connection dates with long delays. Without proactive investment and coordination, grid capacity shortfalls will severely limit new data centre projects, especially in high-demand areas like West London and the Tower Hamlets/Newham area.
Integrated Energy and Infrastructure Planning Is Essential for Sustainability	London's energy infrastructure is at a critical inflection point, requiring multi-sector strategies that align data centre growth with decarbonisation and electrification goals. Future-proofing requires coordinated upgrades, advanced technologies (e.g., on-site generation, battery storage), and flexible demand-side measures. This is not just about capacity, it's about balancing growth with sustainability, resilience, and equity.
Interdependencies Between Energy, Water, and Land	Data centre growth in London faces compound constraints across energy, water, and land, creating systemic risk. Grid access drives site viability, concentrating demand in limited zones, while water scarcity, especially beyond 2035, adds operational challenges for cooling. At the same time, competition for industrial land and delays can misalign with utility upgrades, leading to stranded capacity.
Implications for future development	Sustaining London's data centre growth requires integrated infrastructure planning that aligns grid upgrades, water resource management, land-use policy, and fibre connectivity. Early coordination with energy, water, and telecom utilities can identify zones where combined capacity supports development. Scenario-based planning should model stress conditions such as drought or delayed grid reinforcement. Levers, like incentives for water-efficient cooling, grid flexibility services, and fibre resilience, will be key to reduce systemic risk and maintain London's global connectivity advantage.

Appendices

Contents

Appendix 1

Methodology and scope

Appendix 1 outlines the methodology and analytical framework underpinning the report. It defines the scope of evidence considered, the spatial focus of the study, and the approach to stakeholder engagement across infrastructure and planning domains. This section also details the creation of a new spatial evidence baseline, developed using data from the Greater London Authority (GLA), utility providers, and commercial sources to address gaps and ensure a comprehensive foundation for analysis.

Appendix 1A: Methodology and analytical framework

Our approach integrates spatial, infrastructure, and market intelligence through a structured three-lens framework. This enables a holistic understanding of London's data centre sector, past, present and future.

Short, Medium, and Long-Term perspectives

1 – Current View

Data centre stock, location and activity

- What is the scale and distribution of existing data centres?
- What are the observed development patterns?
- Geospatial baseline of data centre stock, trends and activity hotspots

2 - Market forces & infrastructure constraints in the medium term

Demand signals and capacity planning

- What is driving demand in the sector?
- Where are constraints emerging?
- How are infrastructure organisations responding?
- Mapping of growth drivers, grid constraints, and infrastructure commitments

3 – Long-term strategic readiness

Future scenarios and policy alignment

- What are the likely future growth trajectories for data centres in London?
- Does London's current planning and infrastructure framework enable sustainable data centre development through to 2050?

...enabled by the following analysis techniques

Desktop Analysis

Reviewed of a wide range of sources including industry reports, policy and regulation documents, infrastructure provider data, and planning datasets. This provided a baseline understanding of the current and emerging data centre landscape in London.

Spatial Analysis (GIS)

Mapped the location of existing and emerging data centres against key geospatial layers such as borough boundaries, electricity grid capacity, fibre corridors and planning designation zones. This helped surface locational trends, spatial constraints, and areas of future strategic relevance.

Stakeholder Engagement

Engaged with a cross-section of stakeholders including infrastructure providers (energy, water and fibre), data centre operators and NESO. These engagements helped validate findings, reveal future-facing risks and market signals, and shape recommendations that respond to operational and policy challenges.

Appendix 1B: Approach to creating a spatial intelligence framework

A structured, multi-source approach to validating and aligning data centre locations across London's planning and infrastructure landscape.

1. Data Sources Defined

Primary GLA Datasets:

- London Planning Data (2022 baseline + 2024 updates): Used to identify planning applications relevant to data centre development.
- London Heat Map: Provided additional spatial context for data centre locations covering several sources including GLA's LAEP DataHub.

External Datasets:

- *DataCentreMap (commercial):* Offered additional data centre locations and technical attributes.
- *Valuation Office Agency (VOA) Tax Data:* Used to cross-check land use and operational status.
- *OS MasterMap Topography Building Polygons:* Provided spatial accuracy for footprint validation.

2. Manual Schema Reconciliation

- **Schema Alignment:** Standardised industrial land designations (e.g. SIL, LSIS).
- **Attribute Prioritisation:** Reviewed all fields and retained only those critical to planning, infrastructure, and spatial analysis.
- **Stakeholder Input:** GLA engagement ensured schema alignment with planning priorities and governance standards.

3. Manual Spatial Reconciliation

Location Validation:

- Used Google Earth and Street View to manually verify and correct data centre locations.
- Generated new geospatial points where planning data was incomplete or inaccurate.

Neighbour Mapping:

- Mapped proximity relationships between manually validated points and existing records from GLA and DataCentreMap.

Geometry Reconstruction:

- Recreated geometries using easting/northing values to identify spatial outliers and duplicates.
- Filtered results using building and boundary datasets to ensure spatial integrity.

4. Attribute & Infrastructure Validation

- **Tier Classification Estimation:** Assessed visible infrastructure (e.g. cooling units, backup generators) via satellite imagery to infer likely tier levels.
- **Planning Status Review:** Flagged older planning records with no evidence of progression as lapsed.
- *Note: Site-level energy data was not available for this project due to confidentiality constraints. Instead, an aggregated view of operational and pipeline data has been explored at the borough level. The data was provided by UK Power Networks (UKPN), Scottish and Southern Electricity Networks (SSEN), and National Grid (NG).*

5. Final Dataset Alignment

Finalise the dataset and prepare it for spatial analysis, insight generation, and GIS-compatible file sharing. This includes agreement on key assumptions, generation of comprehensive metadata, and finial schema alignment on consolidated dataset:

- Aggregated data schemas with prefix noting source dataset
- Maintains all original attributes including primary id fields
- Inclusion of source data location with unverified inputs separated into different layers

Appendix 1C: A combined framework for assessing energy demand queues

A structured, multi-source approach to validating and aligning data centre energy demand across London's landscape.

National Grid's connection queue dataset

This dataset includes all signed and unsigned data centre demand connections at transmission level for main substation supply points serving London (see Slide 64), as well as distribution-level connections. The full dataset is expected to serve customers within the Greater London region and contains offered connection dates for each connection.

- Date received: 23/09/2025
- Total transmission-level capacity: 5,120 MW
- Total distribution-level capacity: 1,621 MW

For this analysis, only transmission-level data was used. Connection queue data from DNOs showed significantly higher capacity, and including both sources would risk double counting.

UKPN connection queue dataset

This dataset includes all 'operational' and 'pipeline' data centre demand connections at distribution level from UK Power Networks (UKPN) for customers within the Greater London region (see Slide 67/68).

- Date received: 29/08/2025
- Total transmission level: N/A
- Total distribution level: 2677.09 MW

SSEN connection queue dataset

This dataset includes all 'connected', 'contracted' and 'offered (not yet accepted)' data centre demand connections at distribution level from SSEN for customers within the Greater London region (see Slide 67/68).

- Date received: 30/06/2025
- Total transmission level: N/A
- Total distribution level: 607 MW

This dataset represents the most accurate source of distribution-level connections for the geographic areas served by the respective DNOs. It supersedes the National Grid connection queue and DFES data for this purpose.

Appendix 1D: Scope boundaries of this evidence base

Clarifying the geographic, thematic, and analytical boundaries that frame this evidence base for London's data centre landscape.

This report defines a focused scope to support planning and infrastructure coordination in London, concentrating on data centres as primary land uses. While the Economic and Infrastructure Uses Demand and Supply Study examines broader land use needs, this study focuses specifically on data centre development, its typologies, infrastructure demands, and spatial implications. It aligns with planning datasets and infrastructure capacities and excludes economic modelling to ensure outputs are grounded in planning and policy relevance.

Inclusions

- **Geographic Focus:** The analysis is limited to the Greater London boundary, covering the 32 London boroughs and the City of London, to align with GLA planning data, policy, and infrastructure strategies.

- **Data Centre Typologies**: The study focuses on data centre typologies with the greatest impact on land use and infrastructure, considering only facilities where data centres are the primary use, aligned with the NESO Future Energy Scenarios 2025 (FES 2025), definition of demand from dedicated computing buildings[95]:
    - Hyperscale: Large-scale facilities typically serving cloud providers.
    - Colocation: Facilities leased to multiple tenants.

- **Data Inputs**: The analysis draws on a quantitative and qualitative datasets, including:
    - Planning applications, geospatial, and other relevant data from the GLA.
    - Facility-level and geospatial data acquired from Datacentre Map.
    - Infrastructure provider data from electricity distribution network operators (DNOs), Thames Water, and other relevant sources.
    - Policy documents from national, regional (GLA), and borough-level sources.

- **Stakeholders**: Targeted engagement with infrastructure and planning stakeholders:
    - DNOs, NESO (National Energy System Operator) and National Grid
    - Data centre developers and operators
    - Borough officers
    - Infrastructure providers across energy, water, and fibre network

Exclusions

- **Geographic Limits:** Areas outside Greater London's defined boundary, such as Slough, are excluded from detailed spatial and typological analysis. However, these locations have been reviewed at a high level where relevant, e.g., potential cumulative impact on shared regional infrastructure (e.g. power transmission) that also serves Greater London.

- **Data Centre Typologies**: The analysis excludes facilities where data centres are not the primary use, such as ancillary or embedded sites, due to limited visibility in available records:
    - Edge data centres: Their small footprint, decentralised deployment, and frequent integration into other building types (e.g. offices or telecom facilities) make them difficult to identify and analyse at scale.
    - Enterprise: Privately owned facilities operated by a single organization.

- **Data Outputs:**
    - Temporal Trends: Analysis of grid connection trends over time has been excluded due to limited availability of consistent time-series data, including connection dates, capacity changes, and infrastructure upgrades.
    - Typology and Parameter Patterns: Typology-based analysis has been excluded due to incomplete and inconsistent data, limiting the ability to draw reliable comparisons or identify meaningful patterns.

- **Economics & Jobs**: This study does not assess detailed economic impacts or conduct detailed job creation/wage modelling, as these require econometric methods and datasets beyond the scope of this report.

- **Operator-Specific Commercial Insight:** Commercial strategies, client relationships, or availability zone designations from specific operators are considered proprietary and are out of scope.

Appendix 2

Data Centre typologies and tier classification

Appendix 2 provides a comprehensive overview of key aspects related to data centres. It covers the different types of data centres and their tier classifications, explains energy consumption patterns across data centre and equipment types, and examines the proximity of existing facilities to major electrical infrastructure. In addition, it includes an analysis of existing and planned data centres within London, offering insights into spatial distribution and future capacity considerations.

Appendix 2A: Types of Data Centres

Data centres are classified into four primary typologies.

	Description	Purpose	Usage by Sector	Operator Examples
Hyperscale	A hyperscale data centre is a large facility designed for scalability and large-scale workloads, featuring optimized network infrastructure and minimal internal latency. Widely used globally to support AI, automation, data analytics, storage, processing, and other big data tasks.	• Intensive workloads: AI, social network, search engines, etc..	Across industries, including BFSI, healthcare, auto manufacturing, and media hi-tech.	Google, amazon.com, Microsoft, Apple, facebook, Tencent 腾讯, IBM, ORACLE
Colocation	In colocation data centres, a company rents space in a data centre owned & operated by others, often sharing the site with other companies. The colocation data centre provides shared infrastructure such as cooling, power, network connectivity, and security.	• Cost-effective hosting for business lacking resources to build and manage private data centres; offers power, cooling and connectivity, • Smaller sites support regional needs, while larger facilities serve enterprises and cloud providers.	Across sectors with main sectors being BFSI, Retail, IT & Telecom etc.	EQUINIX, KAO DATA, DIGITAL REALTY
Colocation Retail	Retail colocation data centres are multi-tenant for small and medium sized businesses that need to upgrade to a larger facility. Cloud companies like AWS or Google place on-ramp nodes so tenants can access the cloud.	• Small to medium business wanting to upgrade their data centre infrastructure	Banking, law firms, healthcare and government agencies.	NTT DATA, VIRTUS
Colocation Wholesale	Business model closer to real estate leasing for IT. A wholesale provider leases large data centre capacity for a few big tenants.	• Large businesses	Global retailers, insurance companies, media streaming companies	
Enterprise	Enterprise data centres are owned and operated by a single organization to support its internal IT infrastructure, varying in size and complexity based on needs. These may be located within an office building for low latency & security, or off-site in a lower cost location.	• Dedicated infrastructure for running critical internal business applications, with full control over security, compliance, and performance.	Sectors that have security and strict compliance needs incl. banking, government, and healthcare.	JPMorganChase, HSBC, BARCLAYS, Allianz
Edge	An edge data centre is a relatively smaller data centre facility near the network edge, offering data centre space in a compact footprint. It delivers cached content and cloud computing resources closer to end users to reduce latency and optimise network utilisation.	• Low-latency processing for IoT, autonomous systems, content delivery, and real-time analytics near the data source. • 5G, Telecom companies, IoT, Healthcare, Autonomous vehicles, Smart factories	5G, Telecom companies, IoT, Healthcare, Autonomous vehicles, Smart factories	nlighten, zenlayer, edgeconnex

Appendix 2B: Data centre tier classification

Data centres are classified into four tiers defined by the Uptime Institute, based on infrastructure resilience, redundancy, and expected uptime.

Each Tier level builds on the previous, offering greater reliability and fault tolerance. As facilities move up the tiers, energy connections become more complex and supply requirements more demanding, reflecting expectations around uptime, criticality, and business continuity. While Critical National Infrastructure (CNI) designation does not require data centres to meet specific tier standards, it significantly raises expectations around resilience, security, and operational reliability. As a result, many facilities adopt tier-level design principles to align with best practices and meet stakeholder expectations.

Tier	Power & Cooling Paths	Redundancy	Maintenance	Uptime (%)	Downtime (annual)	Application
	Describes how many independent routes exist for delivering power and cooling.	Indicates the presence of backup systems.	Explains whether the facility can be maintained without shutting down operations.	The expected percentage of time the data centre is operational over a year.	The estimated time per year the facility may be offline due to faults or maintenance.	Describes the type of organisation or workload best suited to each tier.
Tier I	One single path for power and cooling	None (No back up components)	Must shut down for maintenance	99.671%	~28.8 hours	Small offices or non-critical systems
Tier II	One path, with some backup	Partial (N+1) (some backup components on few systems)	Risk of disruption during maintenance	99.741%	~22 hours	SMEs needing improved reliability
Tier III	Two paths (main + backup)	Full backup (N+1 across all systems)	Maintenance can occur without shutdown	99.982%	~1.6 hours	Enterprises needing high availability
Tier IV	Two active paths (fully independent)	Fully duplicated systems (2N+1)	Fully maintainable without impact	99.995%	~26.3 minutes	Mission-critical operations (e.g. finance, healthcare, national infrastructure)

Power Resilience

- Tier I data centres use a single power source, meaning there's no backup.
- Tier III and Tier IV facilities have two independent power feeds and include redundant systems (N+1 or 2N), allowing them to stay online even during faults or maintenance.
- Tier IV goes further by offering simultaneous fault tolerance, meaning it can handle multiple power failures without affecting uptime.
- Backup systems like UPS units and diesel generators are fully separated and duplicated in higher tiers, which significantly boosts energy reliability.

Spatial implications

- Higher-tier facilities require dedicated space for redundant (backup) systems, increasing building footprint and design complexity.
- From Tier III upwards, critical systems (power, cooling, networking) must be placed in separate physical corridors to avoid single points of failure.
- Additional space is also required for emergency equipment, safe access, and maintenance clearance, supporting continuous operation even during repairs.

Appendix 2C: Overview of today's typologies of data centre in London

	Hyperscale	Colocation	Enterprise	Edge
Utility Provision and Capacity	**Requires direct high-voltage grid connections**, often with on-site substations, supporting loads for large campuses[77].	London's grid constraints cause delays and cost risks[8].	Relies on existing utility connections; older buildings may face capacity limits[190].	Easier to provision from local grids or microgrids[190].
Energy Capacity Required	**Typically very high energy demands of 100+ MW**, increasing with AI and cloud service growth[183].	Historically, moderate energy use between **5–50 MW**, reflecting multi-tenant usage and scalable growth[183], but larger connections of 100+ MW are emerging.	Typically consumes **1–10 MW**, depending on enterprise size and workloads[183].	**Low energy footprint**, generally **under 1 MW** for latency-sensitive applications[183].
Minimum Land Take	Large footprint, often exceeding **9,000 m²** (100,000+ sq ft), phased across multiple buildings[77]. Plot sizes of 4-20+ hectares.	Medium-sized sites between **1,000–10,000 m²** (10,000–100,000 sq ft), depending on scale[1]. Plot sizes of 0.4-4 hectares.	Smaller sites, typically **500–10,000 m²** (5,000–100,000 sq ft), flexible within corporate campuses[77]. Plot size depends on the existing building / campus.	Compact footprint, often modular units requiring **0.9 – 90m²** (10–1000 sq ft), deployable on rooftops or telecom spaces[77]. Plot sizes include street cabinets
Power Usage Effectiveness (PUE)	Google hyperscale data centres report 1.1 < PUE < 1.5[188]	1.5 < PUE < 1.6[205]	1.67 < PUE < 1.8[188]	Economies of scale give the small size of edge data centres a PUE > 2[205]
Zoning and Market Fit	Best located in **Strategic Industrial Locations (SIL) or industrial parks**; limited by land scarcity and environmental restrictions[5].	Situated in mixed-use or suburban office parks; zoning must accommodate **multi-tenant** and **interconnection needs**[189].	Usually located on **corporate or research campuses**; zoning varies with legacy usage[189].	Flexible siting in **urban or remote locations**; often integrated within commercial or residential zones[189].
Cooling / Water Usage Effectiveness (WUE)	Advanced cooling technologies achieve WUE between **0.19–0.5 L/kWh**, including liquid and evaporative cooling[6].	Mixed legacy and modern cooling systems lead to WUE of **1.2–2.0 L/kWh**, depending on tenant density[10].	Often uses legacy infrastructure with **WUE 1.5–2.5 L/kWh**; modernization varies[10].	Uses air or closed-loop cooling with **minimal water usage (0–0.3 L/kWh),** favoring urban deployment[10].
Viability Considerations	Moving **increasingly outside London** due to land and power constraints; strategic for scale and renewables[188].	Faces **land scarcity inside London**, driving vertical densification and redevelopment[188].	Viable **within corporate HQs**; less scalable but essential for internal IT functions[188].	Favoured for **low latency and 5G integration**; growing in urban and suburban micro-locations[188].
Ground and Environmental Conditions	Requires stable ground and flood mitigation; sustainability credentials are increasingly critical[10].	Environmental impact varies; **noise, emissions, and water** use are key factors, especially for retrofits[10].	Conditions depend on legacy site; environmental certifications vary[10].	Often located in **rooftops or small spaces with low environmental impact** but possible noise challenges[10].
Adjacencies to Sensitive Uses	Typically sited on **city outskirts or industrial zones** to avoid sensitive land uses and reduce costs[189].	Located in **mixed-use areas** with some **adjacency challenges**, especially near residential zones[189].	Within corporate campuses; adjacency depends on campus location[189].	Integrated in **urban or commercial zones**; planning must address **proximity to residential or public areas**[189].
Security Considerations	**Multi-layer physical and cyber security**, **strict compliance** (ISO, SOC, GDPR), 24/7 monitoring and threat detection[183].	**High security standards** tailored to client needs; 24/7 monitoring and compliance with multiple certifications[183].	Security protocols are **tailored and internally managed**; often aligned with enterprise risk policies[183].	Variable; often relies on **remote monitoring and lighter physical security** due to distributed nature[183].
Access Requirements	Requires **ultra-high-speed fibre, direct connections to IXPs** like LINX, and **dedicated corridors**[190].	Needs **strong interconnection capabilities with carrier-neutral access** near major network hubs[190].	**On-premise or campus-based**; access tailored to internal teams with some outsourcing[190].	**Proximity to end-users** with emphasis on **5G and IoT infrastructure;** often urban or remote[190].
Existing Building Condition	Typically **new builds** on greenfield sites designed for scale and efficiency[187].	Mix of **retrofitted and purpose-built buildings**; condition varies significantly[187].	Often **legacy on-premises or campus facilities**; mixed quality and infrastructure[187].	Mostly **retrofitted or modular units**; deployed in telecom or retail spaces for flexibility[187].
Management	Developed, owned, and operated by major cloud and tech providers, with in-house operational control[187].	Owned and operated by third-party providers with commercial SLAs and cloud connectivity[187].	Privately owned and operated by enterprises; IT teams often manage internally[187].	Remotely managed by central IT or service providers; often smaller scale and less complex[187].

Appendix 2D: Energy consumption across data centre and equipment types

An introduction to how data centre typologies and workloads influence energy distribution, efficiency, and infrastructure planning.

The energy profile of a data centre is critical, not just in total consumption, but in how power is distributed among different functions and workloads. Energy allocation varies by data centre typology, reflecting operational priorities. Hyperscale facilities typically dedicate the highest proportion of energy to server racks to optimise compute density and performance, while enterprise centres, often constrained by legacy infrastructure and lower rack utilisation, devote more energy to cooling systems. These distinctions highlight how typology shapes overall energy strategy and efficiency.

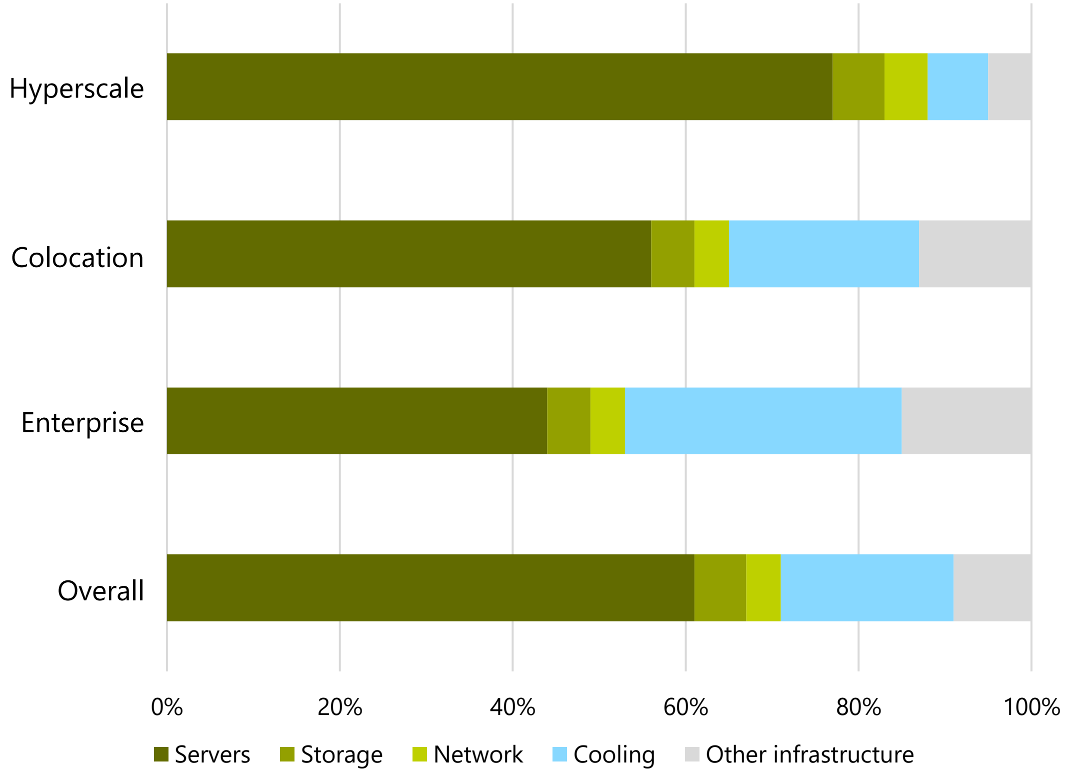
Beyond typology, **workload characteristics play a key role in defining the energy profile**. For example, AI training workloads require a steady and reliable stream of power even at idle, but the real challenge involves unpredictable power spikes, rack-level demand can jump from 60–70 kW to over 150 kW in milliseconds due to GPU synchronisation[150]. This volatility makes robust infrastructure planning essential, as software and power delivery systems (e.g., UPS, PDUs) alone cannot fully mitigate the risk.

These spikes also have implications for grid stability, especially when deploying new AI models. Meanwhile, batch-oriented and delay-tolerant AI training can be scheduled to off-peak hours, whereas low-latency workloads like AI inference and real-time analytics require high-availability power and often drive deployment at the edge, reshaping data centre design and energy management strategies.

Data centre efficiency is measured by **Power Usage Effectiveness (PUE)**, the ratio of total facility energy to IT equipment energy, with lower values indicating higher efficiency. There are standards set by international bodies such as the EU to improve data transparency which include guidelines for how PUE should be measured in data centres, and how often it should be reported[207]**.** Hyperscalers are the most efficient and colocation centres benefit from shared infrastructure, while enterprise and edge centres are generally less efficient, the latter facing unique challenges due to their modular, distributed nature and shared cooling systems.

AI-focused server racks already consume 3–10× more power than traditional internet racks, with projections as high as 50X by 2030[151]. This surge is driving innovation in cooling, power distribution, and sourcing, including greater use of renewables.

Energy Makeup of Data Centre Typologies



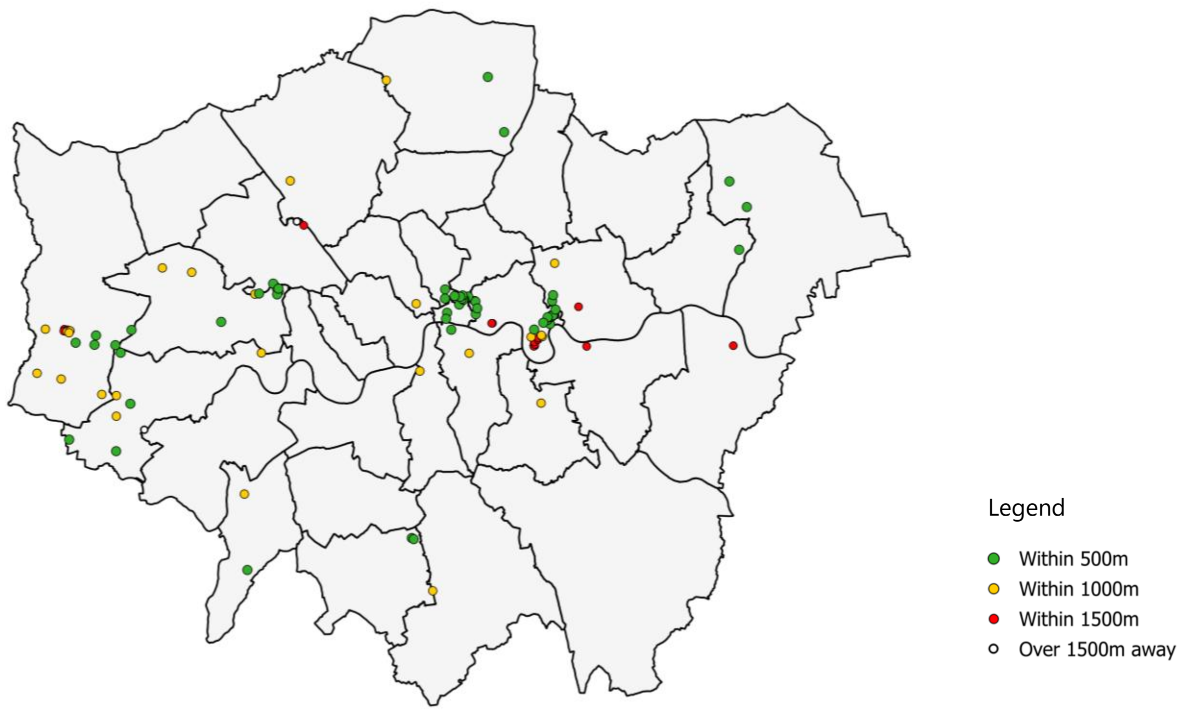
Data Source: IEA , Energy Demand from AI

Appendix 2E: Existing data centres to major electrical infrastructure

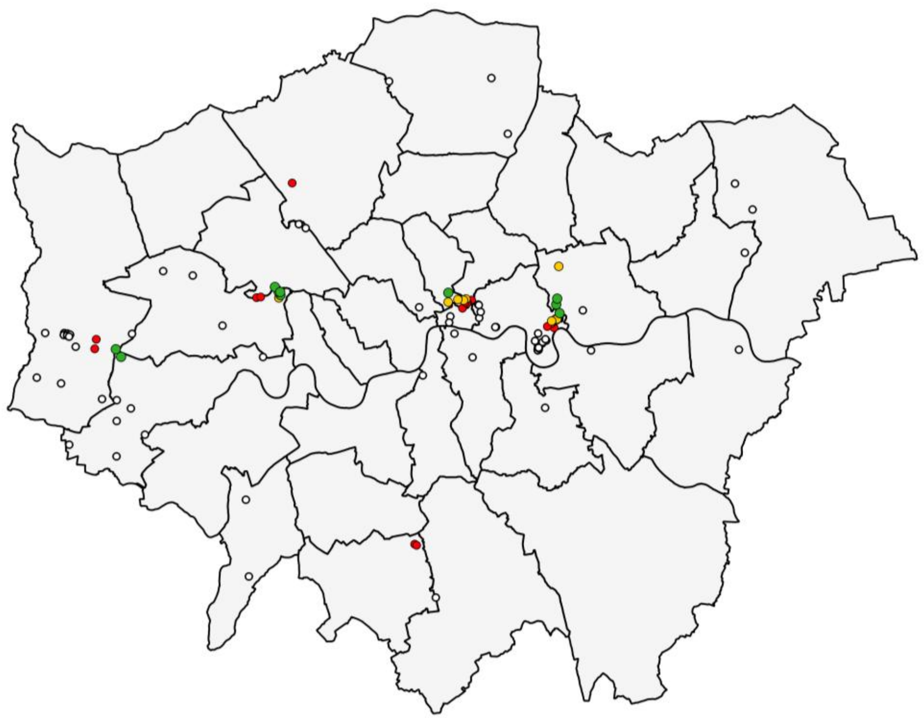
As data centres grow in size and complexity, their electricity demands increasingly require connections to high-capacity infrastructure. A growing challenge is the **emergence of stretch connections**, where a facility must connect to a substation located some distance away due to limited local capacity or the scale of its requirements. These connections are hard to identify, as public data doesn't specify which substations serve individual sites. The best proxy is distance to major substations, though this is imperfect. Data centres are not always connected to the nearest substation, as connection decisions depend on capacity, network design, and technical feasibility. Section 7 explores National Grid supply areas, the types of connections being requested, and how these relate to stretch connections. The analysis below compares data centres with National Grid substations (high-capacity transmission) and primary substations (large distribution-level).

While data centres are generally less likely to be near these than smaller substations, three of the four major clusters are partly close to National Grid substations. For example, the southern Isle of Dogs and most of the Hayes cluster are over 1,500 metres from a grid substation. For data centres in planning this is changing for the Hayes area with four potential data centres being within 600 m of the North Hyde substation. Only one small data centre is more than 1,500 metres from both a National Grid and a primary substation, suggesting most do not currently require stretch connections. However, as data centres scale, connecting to primary substations may become less viable, making proximity to National Grid substations increasingly important. Planning Example: Application 23/01697/OUT (Newham)[152] proposes a very long connection from Royal Docks to Islington GSP.

Existing data centre proximity to a National Grid substation or Primary substation



Existing data centre proximity to a National Grid substation



Data Source: Planning London Datahub, London Heat Map and DataCentreMap data

Appendix 2F: Existing and planned data centres in London (November 2025)

How operational and planned data centres are distributed across London boroughs, supporting the spatial views established in this report.

Borough	Operational	Planned	Borough	Operational	Planned
Barking and Dagenham	1	0	Hounslow	8	0
Barnet	1	0	Islington	6	1
Bexley	1	1	Kensington and Chelsea	0	0
Brent	3	2	Kingston upon Thames	2	0
Bromley	0	0	Lambeth	1	0
Camden	1	0	Lewisham	1	0
City of London	2	0	Merton	0	0
Croydon	1	1	Newham	4	2
Ealing	9	5	Redbridge	0	0
Enfield	3	0	Richmond upon Thames	0	0
Greenwich	1	0	Southwark	2	0
Hackney	4	1	Sutton	2	0
Hammersmith and Fulham	0	0	Tower Hamlets	29	3
Haringey	0	0	Waltham Forest	0	0
Harrow	0	0	Wandsworth	0	0
Havering	2	1	Westminster	0	0
Hillingdon	15	6			

Data Sources: Planning London Datahub, London Heat Map and DataCentreMap data. These datasets were reviewed in GIS and whilst confidence is higher than other iterations of data centre mapping it is important to note that full capture can not be relied upon. Data sourced from the Planning London Datahub was based on textual search of project descriptions, and may not incorporate all data centre applications across London. London Heat Map and the DataCentreMap are predominately based on existing data centres, meaning a check can be carried out about the presence of these data centres. However, neither dataset identified all the data centres in London, highlighting they do not have full coverage.

Appendix 3

Detailed policy review

Appendix 3 presents a detailed evaluation of policy landscape at both national and local levels within four critical domains, including water, energy, planning and land use, and digital infrastructure. It outlines the current status of policy development and implementation within each domain. It also considers the degree of alignment between national strategies and regional practices for London, providing a balanced overview of how policies are evolving across different governance levels.

Appendix 3A: Land Use and Planning Policy

Relevant Policies & Regulations

National Level Policies

- National Planning Policy Framework Revision 2024 (NPPF)[12]
- Planning Act 2008 (NSIP regime)[152]
- Planning and Infrastructure Bill 2024[41]
- Town and Country Planning (Use Classes) Order 2020[153]
- Planning Practice Guidance (PPG)[154]
- Delivering AI Growth Zones November 2025[42]

Regional Level Policies

- London Plan (2021)
  - London Plan Policy E4 – Land for Industry, Logistics and Services[155]
  - London Plan Policy E5 – Strategic Industrial Locations (SIL)[156]
  - London Plan Policy E7 – Industrial Intensification, Co-location and Substitution[157]
- London Industrial Land Supply and Economy Study 2020 (March 2023)[80]
- Tower Hamlets Local Plan 2031 Policy S.EMP1 – Blackwall Data Centre Location[158]
- Draft Industrial Land and Uses London Plan Guidance (LPG)[159]
- OPDC Industrial Supplementary Planning Document (SPD) (November 2023)[160]

Insights

- Paragraph 86 and 87 of the Revised National Planning Policy Framework 2024 (NPPF), requires Local Plans to identify suitable locations for uses such as data centres, and for policies and decisions to recognise and address the specific locational requirements of data centres.
- Recent data centre planning applications have highlighted ambiguities around Class Use designation, with developers and planning authorities often differing on whether such facilities fall under industrial, B8 (Storage), or Sui Generis use, complicating approval processes and policy alignment
- In September 2024 the Government announced that data centre will be designated as Critical National Infrastructure (CNI) granting them **planning status equivalent to power stations under the National Security and Investment Act 2021.**
- **Government has signalled its intention to extend the NSIP regime to large-scale data centres**, streamlining consent through Development Consent Orders (DCOs). Secondary regulations and subsequent National Policy Statement will be introduced in early 2026 to confirm capacity thresholds and commencement dates.
- For facilities below the NSIP threshold, national **guidance remains limited**. Small and mid-scale data centres must rely on standard Environmental Impact Assessments, noise and transport assessments, and borough Local Plan policies to address site-specific and cumulative impacts.
- The UK government has designated four AI Growth Zones as part of its **national AI infrastructure strategy**, aiming to deliver at least 500 MW of capacity per zone and 6 GW nationally by 2030. These zones are strategically located to align with grid capacity and regional growth priorities. While not statutory zoning mechanisms, they provide flexible, case-by-case government support, prioritising grid connections, reducing energy costs, and streamlining planning. The initiative is backed by a dedicated AI Growth Zone Delivery Unit, evolving national policy frameworks, and complementary programmes.
- **Ministerial call-in powers have approved major data centre applications since September 2024**, (e.g. DC01UK, Europe's largest data centre campus in Hertfordshire, and two more in Buckinghamshire) demonstrating direct central Government oversight to expedite strategic infrastructure projects.

- The 2021 London Plan Policy E4 aims to ensure a **sufficient supply of land and premises in different parts of London to meet current and future demands** for industrial and related functions, including data centres. Policy E5 provide strategic protection for Strategic Industrial Land designations for industrial-type activities set out in Policy E4. Policy E7 encourage the intensification of business uses, including those in Use Class B8.
- The London Industrial Land Supply and Economy Study 2020 identified a **10-year shortfall of 2,300 ha of industrial land in Outer London** and rising land values in Inner London.
- Draft London Plan Guidance on Industrial Land and Uses provides **general locational advice** for logistics and manufacturing but **remains non-specific to high-energy digital infrastructure**.
- **Tower Hamlets' Local Plan Policy S.EMP1** stands out by identifying Blackwall as a preferred data centre location supporting City/Canary Wharf connectivity, illustrating how borough-level alignment can deliver strategic infrastructure outcomes. The **OPDC Industrial Supplementary Planning Document (SPD)** also offers a valuable example of local policy addressing the role of data centres within industrial land strategies, providing useful guidance on land use compatibility, infrastructure needs, and planning considerations.
- Borough planning departments frequently lack the technical expertise and consistent pre-application processes to assess cumulative impacts, grid strain, traffic, waste heat, and land-use conflicts. Also, there is limited clarity on the extent to which these considerations are material to the planning process, leading to inconsistent evaluations and decision-making across local authorities."

Appendix 3B: Energy Policy

Relevant Policies & Regulations

National Level Policies

- Climate Change Act 2008[161]
- Energy Act 2023[162]
- National Energy System Operator Act 2024[163]
- Clean Power 2030 Mission[45]
- Connection Reform (Ofgem): TMO4+ and strategic demand reforms (2026)[43]
- Planning and Infrastructure Bill (connection reform)[41]
- National Grid Investment Programme (RIIO-ET3, £35 bn)[46]
- Regional Energy Strategic Plans (RESP)[47]
- Energy Performance of Buildings Regulations (Part L)[164]
- Climate Change Agreements (CCA)[165]
- Connections Accelerator Service[167]
- Ofgem Demand connections update (November 2025)[44]

Regional Level Policies

- London Environment Strategy (2018)[167]
- London Plan SI 2 – Minimising greenhouse gas emissions[85]
- London Plan SI 3 – Energy infrastructure[85]
- London Plan SI 4 – Managing heat risk:[85]
- GLA Energy Assessment Guidance (2022)[168]
- Local Area Energy Plans (LAEPs)[3]
- Mayor's Local Energy Accelerator Programme[169]
- Optimising Data Centres in London - Heat Reuse[116]

Insights

- The UK's energy framework is anchored by the and Energy Act, strengthened by the **NESO Act's** to oversee both transmission and distribution, and supported by **record grid investment through RIIO-ET3** (£35 bn for transmission) and RIIO-ED2 (over £10 bn for distribution).
- **Ofgem's November 2025** update highlights an unprecedented surge in demand connection applications, 125 GW by mid-2025, creating risks of speculative projects crowding out strategic ones. To address this, Ofgem and NESO will introduce demand-side queue reforms from April 2026, applying "first ready, first connected" principles, progression commitment fees, and maturity criteria to prioritise viable projects. These changes **build on TMO4+ generation** reforms (April 2025), which include proposals such as removing the 2 km limit for self-build transmission assets. In parallel, the **Connections Accelerator Service**, launching end-2025, will provide dedicated support and prioritisation for key projects to reduce delays and accelerate delivery.
- **RESP** sets local grid priorities but does not guarantee funding or delivery timelines for data centre connections; actual investments are determined by **DNOs' RIIO-ED2 business plans (2023–2028).** This separation creates uncertainty, as RESP identifies constraints but only RIIO-ED3 will allocate capital to address them. Looking ahead, **Ofgem has signalled a shift in the RIIO-ED3 framework (2028–2033)** toward more proactive and anticipatory investment at the distribution level, which may help reduce delays and improve alignment between planning and delivery.
- Clean Power 2030 sets national targets for decarbonising electricity supply and expanding network capacity. However, due to sectoral uncertainty and the absence of a formal mechanism to integrate detailed digital infrastructure demand forecasts, particularly from DESNZ, DSIT, or DCMS, grid planning remains largely reactive, with upgrades often lagging behind emerging needs.
- The **AI Energy Council**, launched in 2025, aims to align digital and energy policy but lacks strong utility representation, limiting its effectiveness in addressing cross-sector coordination challenges.
- Data centres operate under generic standards (Part L Building Regulations, CCAs) that **fail to reflect their high-density thermal and electrical profiles**, unlike sector-specific frameworks in countries like Germany. CCA's provide efficiency incentives but aren't tailored to the sector's unique requirements.

- London's rapid data centre growth is recognised as one of the drivers contributing to grid constraints in several areas across the city, as acknowledged by the GLA, boroughs, and utilities. While Greater London's sub-regional **Local Area Energy Plans (LAEPs)** represent significant progress towards coordinating spatial and network planning for infrastructure delivery, strategic grid upgrades often lag behind burgeoning demand due to fragmented coordination between planning authorities and network operators.
- Recent grid connection reforms, including enhanced transparency under Ofgem and NESO initiatives, have **yet to deliver meaningful reductions in lead times or connection costs** for London's developers, leaving long-term capacity access uncertain.
- Although the **London Plan mandates 35% improvement over Part L and encourages waste heat recovery under Policies SI 2 and SI 3**, actual integration of data centres into local heat networks and backup power schemes remains largely at the pilot stage.
- A 2025 GLA study on heat offtake highlights **substantial untapped potential for integrating data centres into district heat networks** and enhancing energy system flexibility. However, widespread adoption is currently limited by the absence of standardised technical criteria, uneven capacity across boroughs, and reactive local policy frameworks. The report identifies this technology as strategically important to monitor. It also notes that while waste heat is currently a by-product of inefficient processes, the efficiency of data centres is expected to improve over time, potentially reducing the ratio of power consumption to recoverable waste heat and thus altering the long-term viability of heat reuse.
- Discussions with Cadent highlight a growth in gas connection interest in some data centre clusters in London. The scale of these is important to monitor as they may represent a shift from fossil fuel back up to a reliance on fossil fuel generation to avoid grid constraint. The most relevant GLA limit is **40 mg/kWh NOx** for gas boilers and CHPs, however, **gas turbines** are generally held to **stricter standards** due to their larger scale.

Appendix 3C: Water Policy

Relevant Policies & Regulations

National Level Policies

- Environment Act (2021)[87]
- Water Industry Act (1991)[48]
- National Framework for Water Resources 2025 (Annex 9: AI & Data Centre Water Footprint,[51] published 25 July 2025)
- Environment Agency Water Resource Management Plans (WRMPs) 2025–2030[205]
- Water Framework Directive (WFD)[170]
- Environment Agency Environmental Permits (Abstraction & Discharge Licensing)[171]
- National Planning Policy Framework 2024[12]
- AI Growth Zones Policy [172]
- EU Directive 2023/1791[173]
- UK Infrastructure: A 10-year strategy[25]

Regional Level Policies

- London Plan SI 5 – Water Infrastructure [85]
- London Plan SI 17 – Waterways and pollution protection[85]

Insights

- Under the **Water Industry Act 1991**, supply to non-domestic users like data centres is discretionary, creating negotiation and supply risks[48].
- Water utilities are **non-statutory consultees** in most planning applications, leading to late engagement. The **CNI designation** (September 2024) has increased pressure on water utilities to supply important data centre development.
- **Abstraction licences** (over 20 m^3/day) are managed separately by the Environment Agency. The **London Catchment Abstraction Licencing Strategy** shows the areas of London which have higher resource availability[49].
- **Trade Effluent Consent** remains mandatory for non-domestic wastewater discharge to public sewers, while **Environment Agency Discharge Licenses** govern surface and groundwater discharges under **Water Framework Directive** quality standards[50].
- The **National Framework for Water Resources,** updated in July 2025, encourages alternative cooling and non-potable water use for data centres, however this are **not yet reflected in legislation**. The framework notes that **work is underway to develop policies around data centre sustainability**.
- Government bodies have **called for mandatory reporting and environmental standards**, including limits on potable water and requirements for efficient cooling, While **no enforceable policy currently exists**, growing pressure from regulators and stakeholders may contribute to the development of water-related regulations in the near future.
- **AI Growth Zone applicants** must confirm water access for 500MW infrastructure via written supplier confirmation (volumes, constraints, timelines) and outline wastewater discharge plans, including permits and regulator engagement.

- **Policy SI 5 requires development proposals**, including data centres, to achieve at least the BREEAM excellent standard for the 'Wat 01' water category or equivalent, and incorporate measure such as smart metering, water saving and recycling measures, including retrofitting. Development proposals should also seek to improve the water environment and ensure that adequate wastewater infrastructure capacity is provided.
- **Policy SI 7 requires that referable applications** (which would include some data centre schemes) should promote circular economy outcomes and aim to be net zero-waste. This also requires applications to submit a Circular Economy statement.
- Boroughs currently operate without sector-specific frameworks, standardised assessment tools, or dedicated water-resource expertise for data centre water demand, non-potable supply options, or reuse strategies, with utilities often engaged during later planning stages.
- Most borough water strategies do not reference data centres, nor require local collection of water-use metrics until Annex 9's national reporting requirements become active, resulting in varied local implementation of water management measures.
- In most London boroughs, there are few explicit policies addressing cooling water use, non-potable supply, or discharge for data centres, resulting in a **predominantly reactive approach** to water management rather than proactive oversight

Appendix 3D: Digital Infrastructure Policy

Relevant Policies & Regulations

National Level Policies

- Invest 2035 Industrial Strategy[174]
- Blueprint for Modern Digital Government (2025)[53]
- National Planning Policy Framework Revision (July 2024)[12]
- National Security and Investment Act 2021 (data centres as CNI)[175]
- Data (Use and Access) Act (2025)[176]
- Future of Compute Review (BEIS/DCMS, 2022)[177]
- Electronic Communications Code amendments (Ofcom, 2021)[178]
- Cyber Security and Resilience Bill (anticipated enactment Autumn 2025)[55]
- AI Opportunities Action Plan (2025)[7]
- Sovereign AI Unit[54]

Regional National Level Policies

- 2025 London Infrastructure Framework[4]
- GLA Digital Connectivity Infrastructure Guidance (Oct 2024)[23]
- Planning London Datahub[35]
- Local Area Energy Plans (LAEPs) and LAEP DataHub[179]
- Emerging Borough Digital Infrastructure Strategies[180]

Insights

- The UK's strategic frameworks, including the Future of Compute Review, AI Opportunities Action Plan, and Invest 2035, **affirm data centres as essential national assets**, establishing governance for capacity forecasting, data governance, and resilience standards without prescribing specific site capacity or connectivity thresholds. The Blueprint for Modern Digital Government (2025) provide updated direction on digital infrastructure, AI integration, and public sector transformation.
- Data centres were designated as **Critical National Infrastructure** in September 2024, with the Cyber Security and Resilience Bill (expected Autumn 2025) will bring CNI-designated facilities **under Ofcom's remit,** mandating baseline security-by-design measures, incident-reporting frameworks, and resilience requirements.
- AI Growth Zones policy identifies **five regions for rapid digital cluster deployment**, defining minimum rack-space, fibre-connectivity requirements, and priority spectrum allocation, while detailed latency, redundancy, and interoperability standards are delegated to Local Plans and operator SLAs.
- Ofcom's 2021 Electronic Communications Code amendments streamline street-works consents, grant compulsory land-access rights, and provide planning immunities for communications equipment, yet Section 106 negotiations and local planning delays **continue to impede rapid fibre roll-out to data-centre campuses.**
- Government connectivity programmes, such as Project Gigabit and DCMS's Urban Connected Places Fund, allocate funding to extend high-capacity fibre links to strategic digital hubs in metropolitan areas, enhancing network redundancy and performance for London's data centres. The forthcoming
- No single authority currently consolidates digital demand forecasts from DSIT, DCMS, and network operators into a unified plan, resulting in fragmented infrastructure delivery and uneven regional network resilience.
- Data-centre operators rely on bespoke connectivity agreements for SLAs on latency, resilience, and peering, with limited regulatory oversight to ensure fair access or standardised performance.

- The forthcoming 2025 London Infrastructure Framework, signals a **more integrated and forward-looking approach to infrastructure planning**. It identifies digital infrastructure, including data centres, as a strategic enabler of London's growth, alongside energy, transport, and water systems. It emphasises the need for **resilient, high-capacity digital connectivity**, particularly in support of economic clusters and innovation districts.
- The GLA's Digital Connectivity Infrastructure Guidance (2024) requires new and expanded data centres to **integrate direct fibre connections with minimum capacity thresholds** and ensure non-interference with existing digital networks.
- The Planning London Datahub tracks borough-level planning applications, including those for data centres and fibre roll-outs, enabling monitoring of relevant connectivity upgrades and facilitating cross-borough coordination where planning permission is required for such works.
- Borough digital infrastructure strategies remain nascent, with most plans focusing on public Wi-Fi and 5G rollout rather than enterprise-scale fibre and edge compute requirements for data centres.

Appendix 4

Overview of AI and sector transformation across London

This section explores how artificial intelligence and digital transformation are reshaping London's data centre landscape and sector operations. AI-driven workloads, edge computing, and real-time analytics are creating unprecedented demand for high-density, low-latency, and energy-intensive infrastructure. At the same time, London's diverse industries, from finance and healthcare to retail and education, are digitising rapidly, driving the need for resilient, compliant, and sustainable data centres. Together, these trends position London as a critical hub for next-generation digital infrastructure, enabling innovation and competitiveness in an AI-first economy.

Appendix 4A: AI growth is expected to impact data centre demands

AI's growth is reshaping the data centre landscape, driving unprecedented energy demand in London's densest zones. With growing demand for edge AI inference, London offers a unique opportunity to develop compact, high-performance data centres that power next-gen urban innovation and digital services.

General impact of AI on data centre demand

- **AI is now the main driver of digital infrastructure growth:** According to the IEA's Energy and AI report (2025), the widespread adoption of large language models and generative AI has surpassed traditional IT workloads as the leading contributor to data centre demand[181]. AI is a key sector in the UK's Industrial Strategy and the introduction of AI Growth Zones in the UK puts accelerating the country's AI data centre capacity as a primary objective[182].

- **Electricity demand is accelerating:** The report also projects that AI will be responsible for a significant portion of the expected doubling in global data centre power consumption by 2030. This surge is driven by the intensive requirements of training advanced AI models, which demand high-density compute, substantial memory bandwidth, and ultra-fast interconnects.

- **Power density and high availability is essential:** AI workloads require resilient, low-latency, always-on facilities with robust power and cooling infrastructure according to the Uptime Institute Global Data centre Survey (2024)[183]. Specialised AI facilities now routinely see rack densities of 60–100+ kW, far above the industry average.

- **AI infrastructure is bifurcated:** AI is driving two distinct infrastructure types:
  - **Training:** Typically located hundreds of kilometres away from end-users, often in hyperscale campuses. While this distance supports economies of scale, the UK use cases is centred around data sovereignty. However, the high price of energy in the UK is a significant factor impacting where training facilities are situated.
  - **Inference:** Needs to be distributed across metro, edge, and embedded systems for real-time, user-facing applications.

- **Asymmetric energy footprint:** A single training run of a large AI model can consume as much energy as hundreds of thousands of inference queries, underscoring the stark disparity between training and deployment of the AI model. This insight is highlighted in Loughborough University's Scaling AI Computing and Infrastructure within Net Zero Goals briefing (2025)[184].

The UK's strategic response to the AI-driven data centre challenge

- **Exponential Energy Demand Surge:** According to the Loughborough University policy brief, UK AI-related compute energy use is forecast to climb from ~5 TWh/year currently to over 100 TWh/year by 2030, equivalent to 25% of the UK's total 2021 electricity consumption[184]. This surge places acute stress on the National Grid, particularly in high-demand corridors such as Greater London, Thames Valley, and the South East.

- **Regional Resilience through Distributed Build-Out:** The UK Government's AI Opportunities Action Plan highlights AI Growth Zones (AIGZs) as delivery engines but cautions they alone cannot close the compute gap[185]. A "shoot-for-the-moon" approach, targeting 15–30 GW of capacity via £40 billion of public spend, faces land and power constraints; instead, an "accelerated diversification" strategy of 3–5 GW across ten 300 MW+ AI-specialist campuses offers a resilient, regionally distributed model that maintains ~3% of global compute share by 2030.

- **Sovereign Compute Capacity as a National Priority:** According to the Tony Blair Institute's Sovereignty, Security, Scale report, without targeted grid reinforcements, planning reform, and expedited delivery mechanisms, the UK risks failing to scale its AI-ready infrastructure at the pace needed to match its twentyfold sovereign compute ambitions by 2030[187]. The UK must rapidly diversify its AI infrastructure beyond designated AI Growth Zones to avoid a "compute gap" and ensure at least 6 GW of AI-ready capacity by 2030. It recommends embedding dedicated AI expertise within the National Energy System Operator, reforming grid-connection rules through the Connections Accelerator Service, and accelerating Nationally Significant Infrastructure Project consent processes to fast-track data centre development.

- **London's Edge and Hyperscale Nexus:** London's orbital data-centre hubs, Park Royal, Royal Docks, and Isle of Dogs, are rapidly evolving to meet inference-driven, low-latency demand. CoreWeave and Global Switch's Nvidia clusters in Docklands illustrate hyperscale AI roll-outs, while Segro's £1 billion Park Royal facility demonstrates major private-sector commitment to larger than 56 MW AI infrastructure. These developments reinforce London's dual role as an inference edge market and national AI compute anchor.

Appendix 4B: The digitisation of sectors in London

London's sectors are accelerating digital transformation, driving demand for AI, edge computing, and resilient data centre infrastructure.

Cross-cutting industry drivers

- Digital re-engineering of core operations: London organizations are overhauling IT systems to support AI, real-time analytics, and distributed computing—fuelling demand for regional and edge data centres[70,191].
- AI Inference as the new utility: Finance, retail, healthcare, and local government increasingly require immediate AI outcomes in real time, driving investment in inference-optimised, low-latency data centres within the city[192].
- Security & sovereignty are must-haves: Handling financial, health, or citizen data requires secure, compliant infrastructure. London organisations are prioritising UK-based data centres with strong security credentials[193].
- Distributed hybrid architectures: In-store fulfilment, hospital AI hubs, and campus learning platforms are shifting compute to hybrid and edge environments, tightly integrated with London's urban fabric[194].
- Infrastructure = competitive edge: Leading London firms view scalable, secure, AI-ready data centres not just as a cost, but as strategic enablers of resilience, compliance, and user experience[195].

Sector use cases

- Finance & Investment: Schroders is outsourcing IT infrastructure to support AI adoption, demonstrating a need for secure, low-latency data platforms near fintech centres[196].
- Retail & Consumer: B&Q has converted London stores into mini-fulfilment hubs for online orders, backed by AI-powered inventory management, requiring edge data centres to process in real time[197].
- Public Sector & Local Government: London councils and NHS trusts are deploying AI chatbots, diagnostics, and engagement tools, necessitating compliant, secure, and resilient data centre infrastructure[198].
- Healthcare: Kings College led AIDE projects placed GPU-powered inference hardware onsite, accelerating AI diagnostics in NHS hospitals, highlighting the need for local compute power[199].
- Education & Skills: Universities like UCL and KCL are deploying AI learning platforms and federated systems, requiring on-campus or nearby data facilities for performance and data control[200].

London-specific data centre impact

- London's data centre landscape is not only scaling but also diversifying in form to match workload types. Metro edge nodes are emerging to meet the AI inference and 5G low-latency needs of regulated industries.
- Inference hub for key sectors: London's core industries demand ultra-low-latency inference support, fuelling a wave of compact, GPU-enabled data centres[192,196].
- Connectivity excellence: With over 2.7 GW IT capacity and dense fibre/internet exchanges, London leads Europe's digital infrastructure ecosystem[197].

Driver	Impact
AI adoption	• Growth in edge and metro data centre demand within zones like Isle of Dogs, King's Cross, and Stratford for low-latency AI workloads. • High-density rack requirements (40–70 kW) increase retrofit and power demands[201,202].
Digitalisation in finance & public sector	• Strong demand for colocation and hybrid cloud capacity in inner London financial districts. • Data sovereignty and security requirements drive London-based builds over overseas hosting.
Retail shift to omnichannel	• Proximity to logistics and urban edge zones pushes demand toward inference-enabled metro centres near retail corridors (e.g. Wembley, Park Royal) [203].
Health data management	• Need for compliant, resilient infrastructure to manage regulated patient data. • Push for edge capacity near teaching hospitals (e.g. Whitechapel, St Pancras)[199].
Cloud and OTT expansion	• Need for compliant, resilient infrastructure to manage regulated patient data. • Push for edge capacity near teaching hospitals (e.g. Whitechapel, St Pancras) [204].
Latency, sovereignty & ESG pressure	• Preference for green, local data centres that minimise latency and emissions. • Retrofit and heat reuse (e.g. Bidder Street) become central.

Appendix 5

Spatial Scenarios & Pathways for Data Centre Growth

This section explores different spatial scenarios for accommodating future data centre growth across London. The analysis considers varying levels of confidence, infrastructure constraints, and market dynamics, alongside the potential impact on designated Opportunity Areas. Suitability for development depends on factors such as land availability, grid capacity, planning priorities, and proximity to existing clusters. By examining these scenarios, the section provides an evidence base to inform strategic planning, highlighting where investment could unlock capacity while aligning with London's growth priorities.

Assessing London’s spatial and infrastructure barriers to data centre growth

Exploring spatial and infrastructure challenges behind London’s potential 10-fold data centre expansion, shaping long-term decisions on energy, water, and connectivity.

London’s data centre capacity is projected to grow from approximately **~1GW today to as much as 11 GW by 2050**, representing a more than **ten-fold increase**. This level of growth is comparable to the electricity demand of several million UK homes and will introduce significant challenges for infrastructure systems. The most pronounced impacts are expected on the energy network, with additional but still important implications for water resources.

This section provides a high-level assessment of how proposed data centre growth pathways may impact infrastructure capacity across London in the short- to medium-term, with a **focus on the period up to 2038**. Beyond this point, confidence in growth projections decreases, and findings should be considered indicative. Likewise, commentary on infrastructure implications becomes harder to quantify over longer time horizons, given uncertainties in technology, policy, and investment patterns. The aim is to identify broad demand, supply and resilience risks and opportunities across key integrated infrastructure systems, energy, water, fibre and connectivity, and resilience, using available data and strategic spatial overlays.

The assessment is structured around three spatial scenarios, each illustrating different data centre growth typologies and levels of confidence. These scenarios aim to identify areas where further analysis may be required, considering the indicative Opportunity Areas within the 2021 London Plan. The approach also acknowledges the interdependencies between infrastructure capacity and wider considerations such as growth, decarbonisation, and land use. Outputs will include spatial maps, scenario narratives, and a thematic risk overview to support informed decision-making and future planning.

Infrastructure Analysis Approach

A review of key spatial scenarios considering demand, supply and resilience

- **Scenario 1:** Highly desirable areas for large typologies
- **Scenario 2:** Emerging areas to support for large typologies
- **Scenario 3:** Urban areas for edge typologies

Impact on Opportunity Areas

High-level infrastructure risk and opportunity assessment considering demand, supply and resilience factors

- **Energy** - transmission and distribution network impact
- **Water** - supply, wastewater and impact on drought resilience
- **Fibre and Connectivity** – impact and opportunities

Spatial scenarios and analysis of data centre growth opportunities

Assessing suitability across London based on land availability, grid capacity, planning constraints, and market preference for existing clusters.

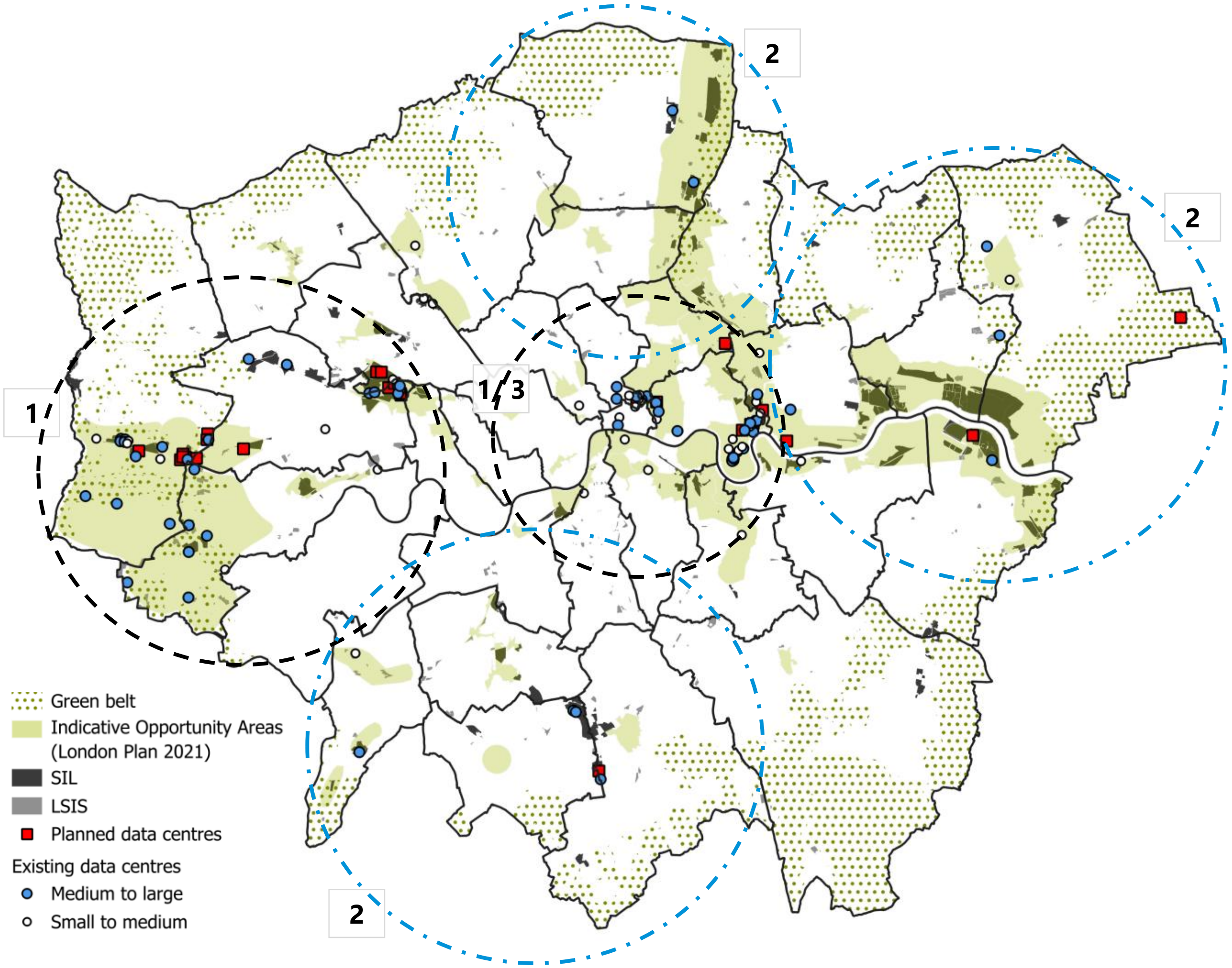
Spatial analysis is essential for understanding where future data centre growth could be accommodated across London. Suitability depends on factors such as land availability, infrastructure capacity, competing priorities and market preferences, particularly the tendency to cluster near existing hubs. Growth patterns can be grouped into three scenario types, each associated with different typologies and confidence levels:

Scenario 1: Highly desirable but constrained areas for large data centers typologies: Prime locations within London, near major existing clusters, remain highly sought after for large-scale facilities. However, these areas face significant barriers, including high land values, limited grid capacity. This includes Brent, Hillingdon, Ealing, Tower Hamlets, Newham.

Scenario 2: Emerging, less constrained areas, for large data centers typologies: Peripheral boroughs, while less attractive in terms of proximity to clusters and latency, offer fewer barriers to expansion. These areas benefit from more available land and reduced grid bottlenecks, enabling larger campus-style developments. These include Enfield, Havering, Bexley, Barking & Dagenham, Sutton, and Croydon, all of which have seen some data centre activity and could present future opportunities.

Scenario 3: Urban areas for edge typologies: There is a growing trend toward edge data centres and micro facilities within urban locations to meet rising demand for low-latency services, supporting applications such as AI and IoT. Innovative development patterns, including multi-storey and retrofitted buildings, help address urban space shortages and enable greater network decentralisation. Boroughs of interest may include Hackney, City of London, Islington, Camden, Westminster and Tower Hamlets.

Figure 42: Map of growth opportunity regions for data centres

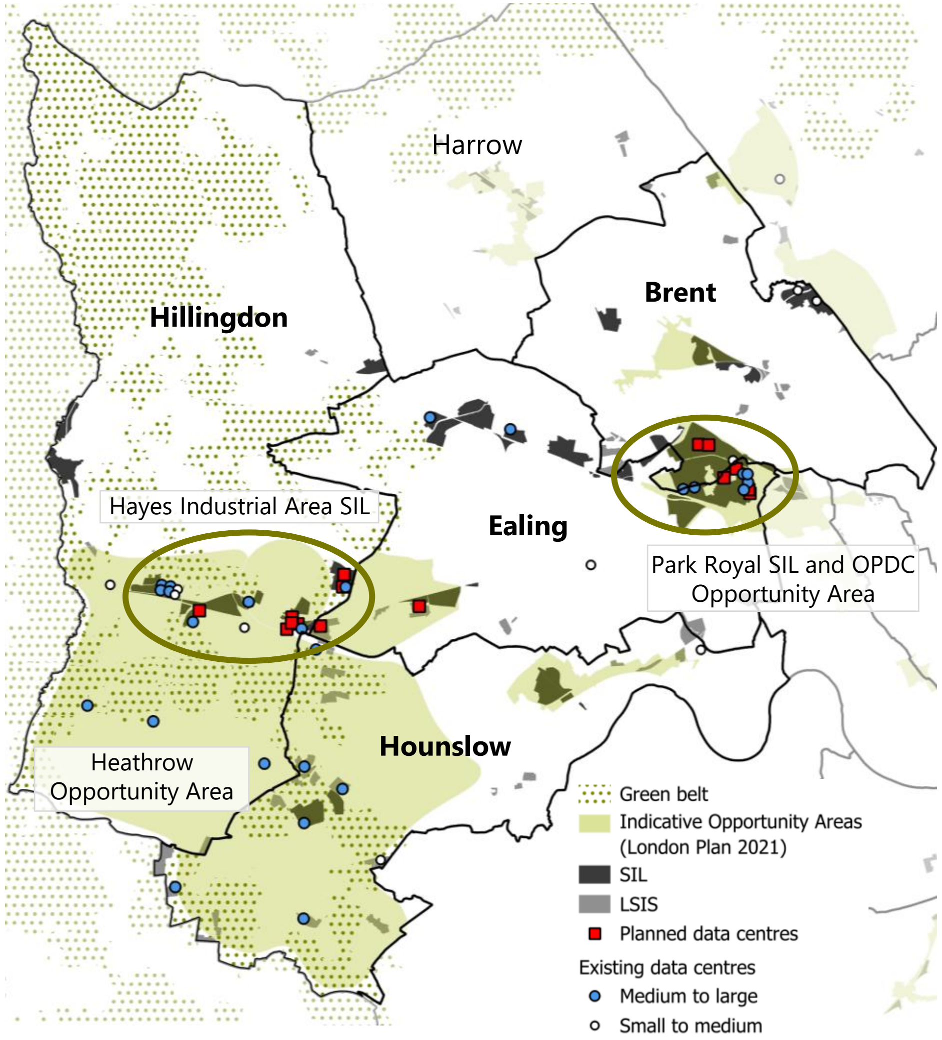


BURO HAPPOLD

Scenario 1: Sustained interest in highly desirable areas of West London

Focus	Description
Boroughs in focus	**Hillingdon, Ealing, Brent, and Hounslow** at time of publication have a total of 35 operational data centres, with 13 facilities in the planning stage.
Data centre demand outlook	This area will likely continue to draw significant attention from colocation and hyperscale providers.
Time horizon/ confidence	Short to medium term, with high confidence.
Electricity infrastructure opportunities and risks	Grid infrastructure in this area will likely continue to face capacity challenges through to at least 2038 despite major upgrades to new substations, including those at Uxbridge Moor, North Hyde, Willesden, and Kensal Green, as well as upgrading the network at Amersham, Laleham and Iver.
Water infrastructure opportunities and risks	Data centres will likely use advanced closed-loop cooling and water-recycling systems to minimize consumption. Local abstraction is rare and tightly regulated, and pipelines from distant facilities like Mogden are likely to be impractical. Future options such as treated effluent reuse or river abstraction would require major infrastructure works and formal agreements.
Land availability	These boroughs have low industrial land vacancy and face ongoing grid capacity pressures due to clustering.

Figure 43: Data centre growth focus: West London

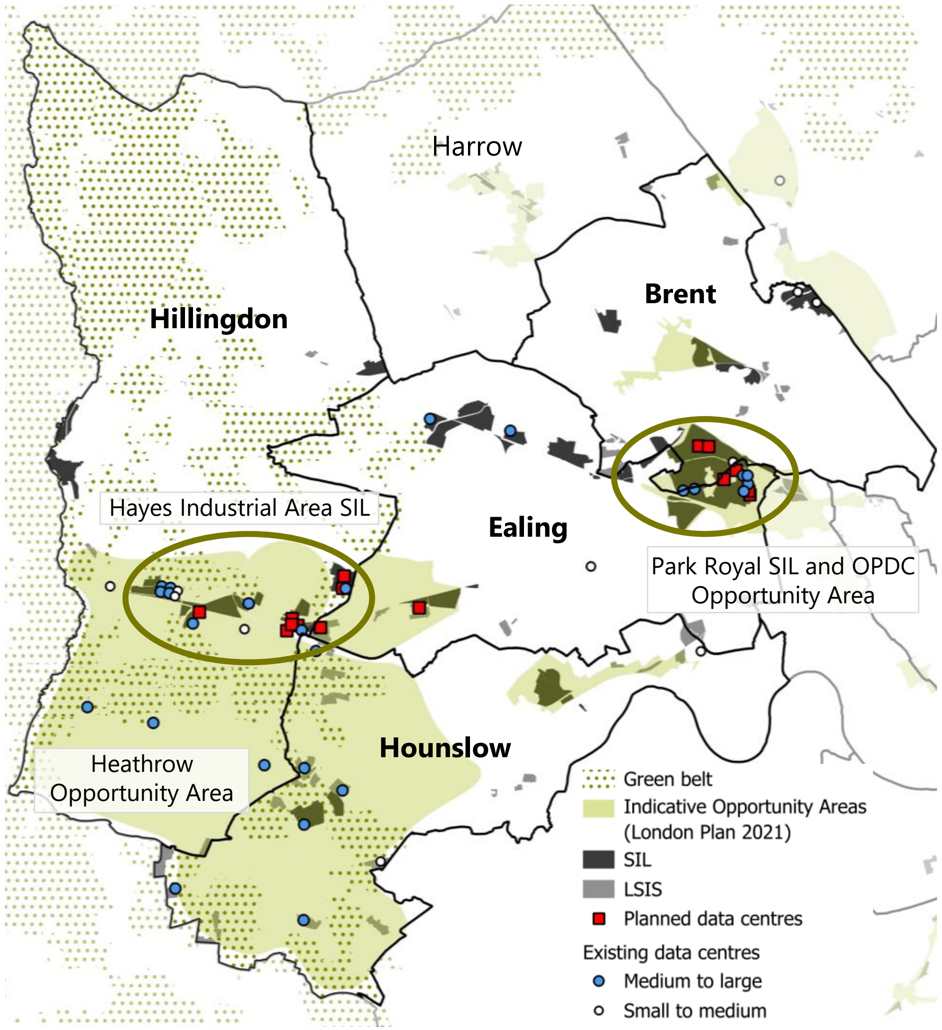


BURO HAPPOLD

Scenario 1: Sustained interest in highly desirable areas of West London (continued)

Focus	Description
Impact on places, including OAs: <u>Hayes</u>, <u>Southall</u>, <u>Heathrow</u>, <u>OPDC</u>[138]	Heathrow recorded more than 160,000 jobs in its OA in 2023, placing it at the top of London's OAs by number of existing jobs. While Heathrow's role in future data centre growth appears limited, high demand and OPDC-linked funding (£38M GHNF) highlight the need for grid reinforcement. Key rail expansions within OPDC, such as HS2's Old Oak Common station and emerging initial proposals for the London Overground West London Orbital route, have safeguarded land but may further strain infrastructure and prioritise capacity over data centre development. OPDC is driving innovation in heat offtake opportunities and early infrastructure planning to ensure that data centre growth can provide direct community benefits.

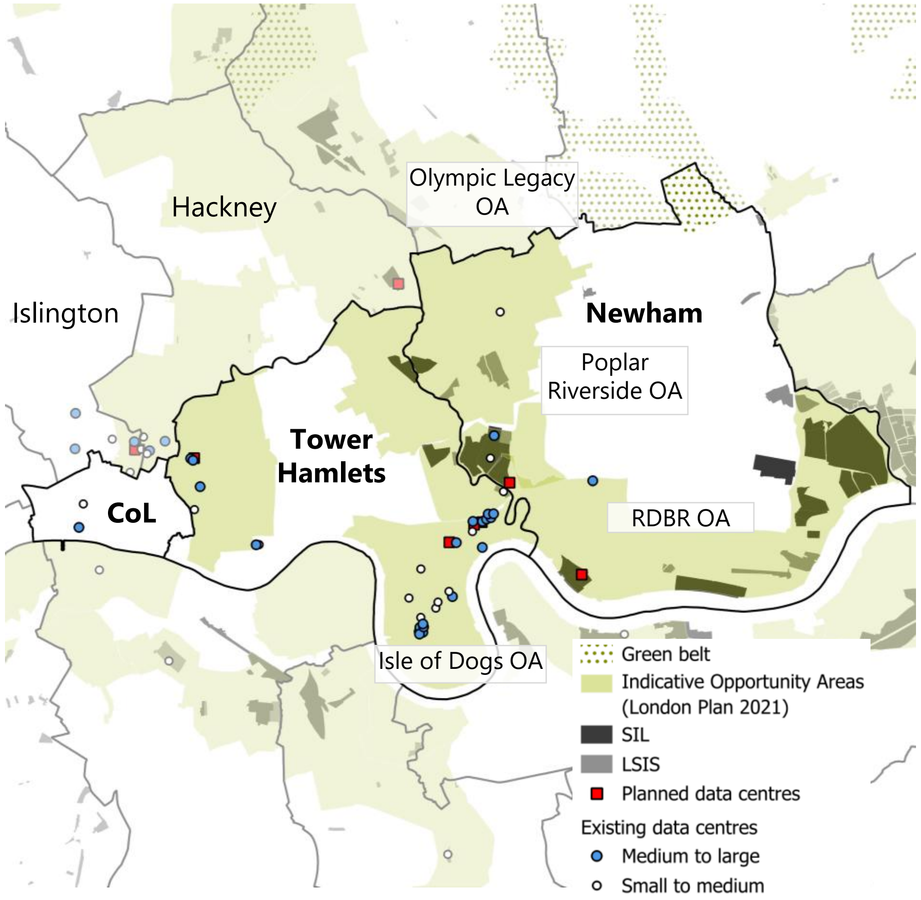
Figure 43: Data centre growth focus: West London



Scenario 1: Sustained interest in highly desirable areas of Inner East London

Focus	Description
Boroughs in focus	**City of London (CoL), Newham, and Tower Hamlets** at time of publication host 35 operational data centres, with 5 additional facilities in the planning pipeline. The full capacity of these data centres in connection queues is hard to assess accurately but it likely exceeds 0.8 GW.
Data centre demand outlook	These boroughs, as well as neighbouring Islington and Hackney, are expected to maintain strong demand by colocation and edge operators seeking proximity to existing clusters and provide low-latency workloads.
Time horizon/ confidence	Short to medium term, with high confidence.
Electricity infrastructure opportunities and risks	London Power Tunnels Phase 2 is upgrading the grid with new tunnels and substations at Hackney, St Pancras, Farringdon, West Ham, and Nelson Street. This adjoins rather than falls directly in the area but will help reinforce supply. Additionally, the GSP in Barking and Dagenham which also supplies the Inner East is receiving upgrades. Despite these works, these areas may face power challenges into the future, in particular the Isle of Dogs has been noted by Tower Hamlets Council (during LAEPs) as having physical constraint to accommodate additional infrastructure. The need for continued reinforcement through innovative solutions to sustain growth is needed.
Water infrastructure opportunities and risks	The Beckton Water Recycling scheme, part of the wider London Water Recycling scheme by OfWat will contribute recycled water to local reservoirs, which will lessen the load on the local water supply due to data centres[126]. Data centres will likely use advanced cooling technology and water-recycling systems to minimize consumption
Land availability	The City of London has low industrial land vacancy, with an average of less than 5% across the 3 boroughs in focus. Opportunities to increase capacity could come from retrofitting existing assets, such as older data centres and warehouses. This approach is explored in Scenario 3.

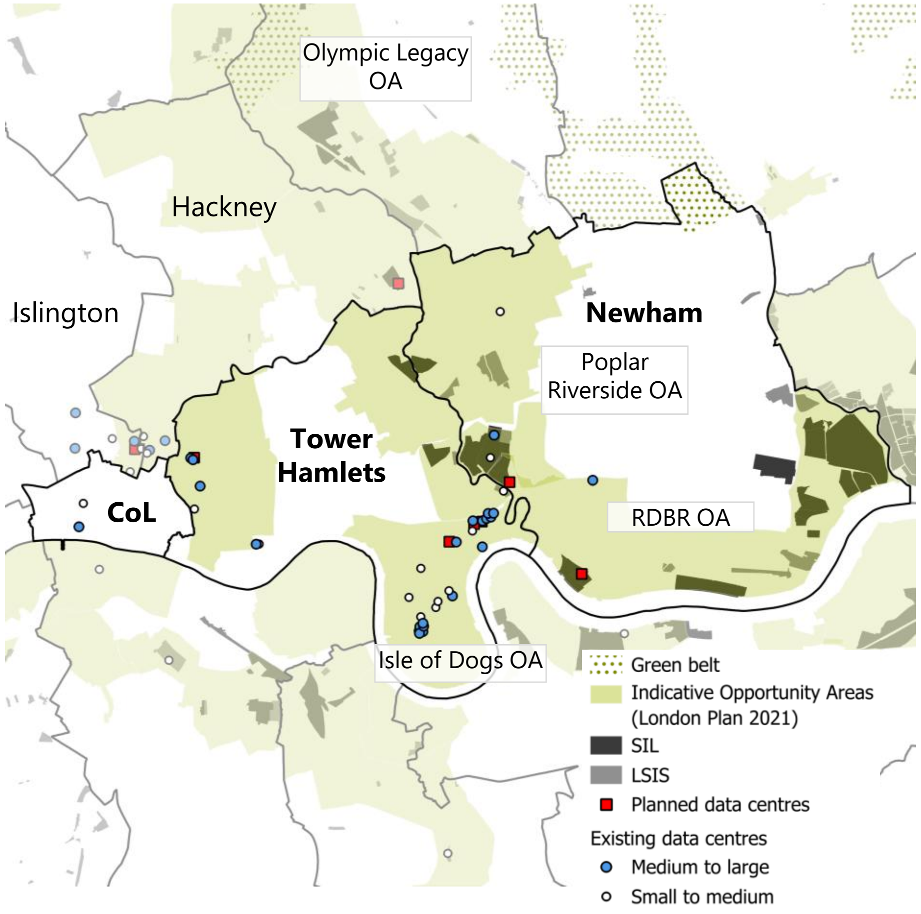
Figure 44: Data centre growth focus: Inner East London



Scenario 1: Sustained interest in highly desirable areas of Inner East London (continued)

Focus	Description
Impact on places, including OAs: Isle of Dogs, Poplar Riverside, Royal Docks & Beckton Riverside (RDBR) and Olympic Legacy[138]	RDBR makes up for 5% of London's total industrial land and **identifies data centres as a priority growth sector**. Royal Docks faces competition from mixed-use regeneration and housing. These dynamics create planning trade-offs, with data centres competing against cultural and commercial uses for scarce industrial space. The Isle of Dogs is shifting away from a predominately commercial district towards a more balanced urban mix of residential, life sciences and office diversification exemplified by One North Quay health, aligning with the need for balance between strategic functions and local activities within the Central Activities Zone. The waste heat produced from data centres in this area could provide a valuable opportunity for wider decarbonisation, linking to large scale heat networks – helping to improve the economics through providing low (or in some arrangements) zero cost heat. A potential heat transmission route from Newham (which also includes the Becton Waste Water Treatment Plant – which is another major heat source) through Tower Hamlets, could bring low cost heat to areas across these boroughs as well as bring heat to more central boroughs. In these areas heat demand is high but space and waste heat opportunities are low, meaning the Inner East area represents an important opportunity, not only locally, but at a wider regional level for heat network deployment.

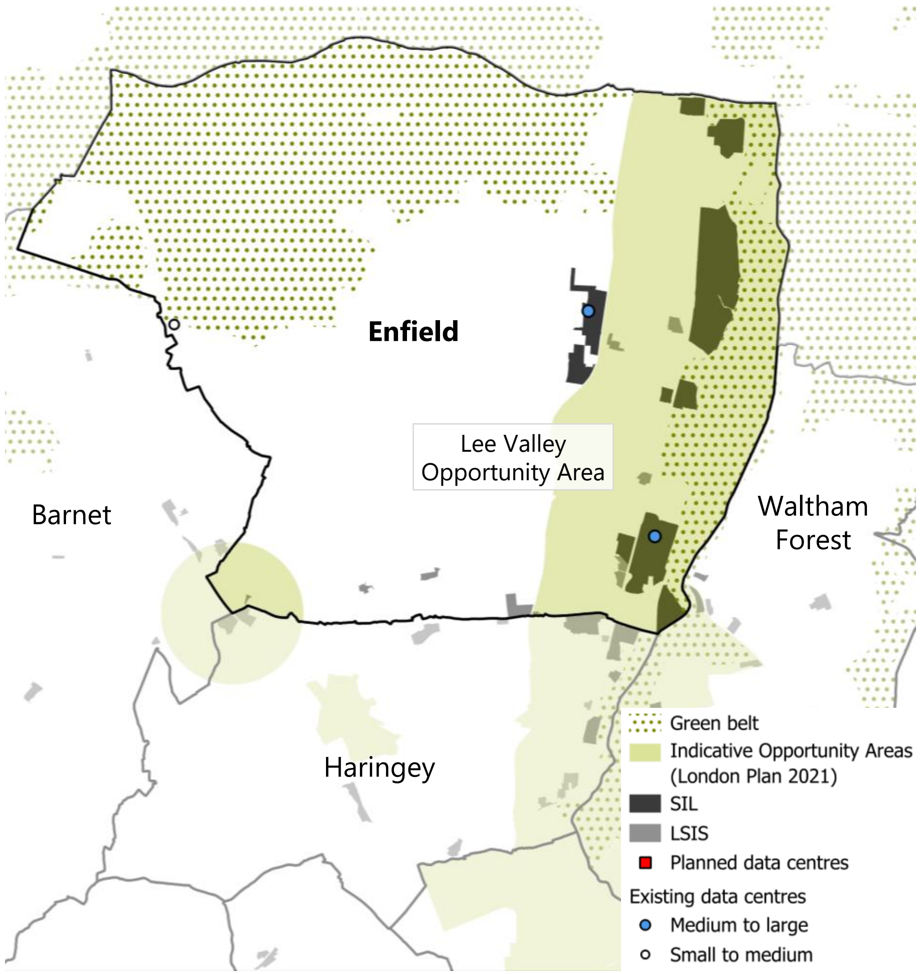
Figure 44: Data centre growth focus: Inner East London



Scenario 2: Exploring North London as an emerging opportunity for growth

Focus	Description
Boroughs in focus	Enfield and its neighbouring boroughs at time of publication hosts 4 data centres and is **well-positioned for further development** due to its proximity to major electricity infrastructure, a critical water catchment zone, and established data centre clusters beyond Greater London, notably Hemel Hempstead and Harlow. The Tri-Borough Partnership between Enfield, Haringey and Waltham Forest provides a strong foundation for aligning planning, inward investment and skills strategies, and focus on digital connectivity[139]. Connection queue data for the area is limited but is currently <0.2 GW.
Data centre demand outlook	This area will likely see increased attention from colocation and hyperscale providers as seen in the transmission-level connection queue.
Time horizon/ confidence	Medium to long term, with medium confidence
Electricity infrastructure opportunities and risks	The addition of data centres in the area will significantly increase electricity demand. However, the North London Reinforcement project is upgrading the overhead line between Pelham and Hackney from 275kV to 400kV by 2028, with six substations, including Brimsdown, along the route also receiving major upgrades, boosting capacity and improve grid reliability for new connections[140].
Water infrastructure opportunities and risks	Beckton Water Recycling Scheme will treat wastewater and discharge up to 300 million litres per day into the River Lee Diversion, boosting Lee Valley Reservoir supplies and improving North East London's potable water resilience. However, it does not account for non-potable needs such as data centre cooling, and rapid growth could increase pressure on local water resources.
Land availability	Enfield's industrial land vacancy is just 2.2%, with Lee Valley OA averaging 1.8% across Enfield, Haringey, Waltham Forest, and Hackney. Despite strong demand and limited supply, potential exists in Green Belt and emerging grey belt land. Emerging projects, Crews Hill and Chase Park have been shortlisted by the Government's New Towns Taskforce for a potential new town, with plans for up to 21,000 homes across 884 hectares of Green Belt land in Enfield.

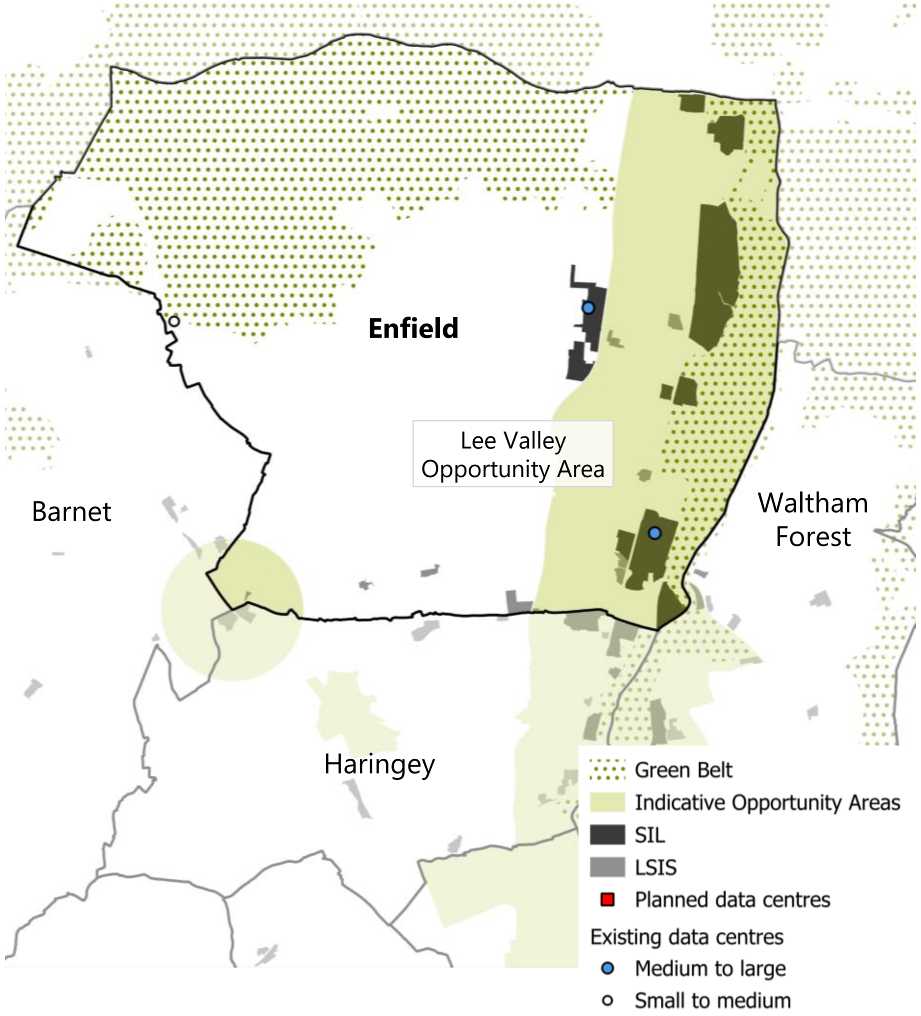
Figure 45: Data centre growth focus: North London



Scenario 2: Exploring North London as an emerging opportunity for growth (continued)

Focus	Description
Impact on places, including OA: Lee Valley[138]	The OA contains significant assets including the Lee Valley Regional Park, established communities and strategic transport links into Central London and towards Cambridge. With 9% of its land designated as SIL and the second-largest workforce of any OA at around 90,000 jobs, Lee Valley is positioned along the UK Innovation Corridor and could be a a strategic location for data centres to support key sectors such as life sciences, AI, advanced manufacturing, agri-tech, and digital sectors identified in the growth plan[141-143]. However, extremely low vacancy rates mean data centre growth will compete directly with mixed-use regeneration projects such as Meridian Water and Blackhorse Lane, as well as long-term infrastructure schemes like Crossrail 2 (now beyond 2040). This intensifies pressure to balance housing and employment needs. A strength of the Lee Valley OA is its economic diversity, from large-scale logistics to creative industries and local manufacturing. Data centres could be positioned to reinforce this strength, for example, by improving digital connectivity and integrating with local supply chains. This is particularly relevant given persistent connectivity gaps, with only 31.6% of premises in Enfield have full-fibre coverage, making parts of the Valley internet "not spots". Addressing these gaps could enable inclusive growth and support local businesses[144]. Finally, integrating data centres into the Lee Valley Heat Network strategy could deliver additional community benefits, aligning with sustainability goals and creating synergies between digital infrastructure and low-carbon energy systems.

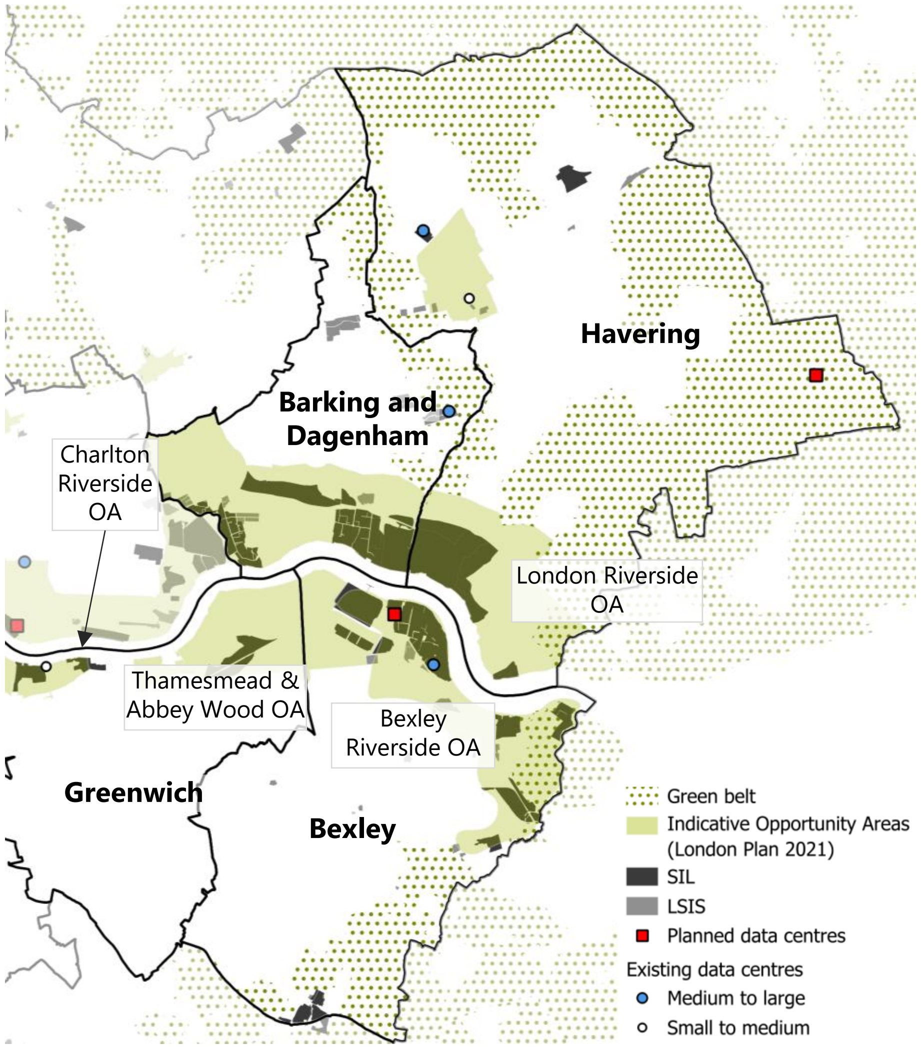
Figure 45: Data centre growth focus: North London



Scenario 2: Exploring East London as an emerging opportunity for growth

Focus	Description
Boroughs in focus	**Barking and Dagenham, Havering, Greenwich, and Bexley** currently host five operational data centres and 2 in planning. The connection queue is ~1 GW for this area, extensively driven by the data freeport in Havering
Data centre demand outlook	These boroughs are attracting major investment attention from hyperscale and colocation operators. Notably, Havering is promoting a 600MW London Data Centre Campus on green belt land at Dunnings Lane and Fen Road.
Time horizon/ confidence	Medium to long term, with higher confidence north of the river and medium confidence south of the river.
Electricity infrastructure opportunities and risks	Ongoing grid upgrades aim to meet rising demand, with London s (operational by 2026) strengthening Kidbrooke and Eltham links, while Barking's new 132kV substation adding further capacity to support growth. In Bexley, modernised circuits boost capacity, but planning refusal of a 212MW battery storage scheme highlights flexibility gaps. Data centre growth risks grid congestion and could constrain delivery of OA plans unless reinforcement and storage increase.
Water infrastructure opportunities and risks	Water sources for data centres include the River Roding, which feeds Beckton, Crossness, and Riverside Sewage Treatment Works. Increased data centre demand could place additional stress on these systems and the wider water network.
Land availability	These boroughs have an average industrial land vacancy of 8%, offering potential for data centre development. London Riverside Opportunity Area alone accounts for over 12% of London's industrial land, representing 30% of its total area[145]. Additional potential exists in Green Belt and emerging 'grey belt' sites, such as the proposed Havering Digital Freeport LDO.

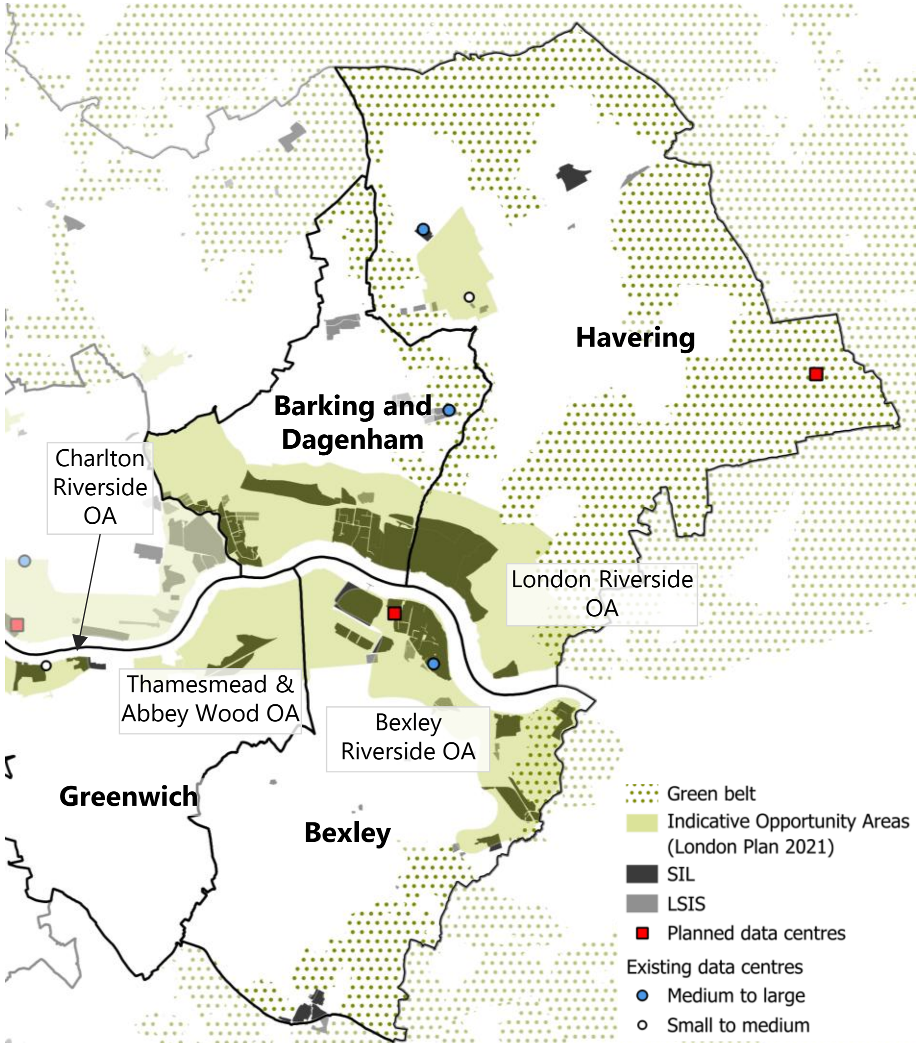
Figure 46: Data centre growth focus: East London



Scenario 2: Exploring East London as an emerging opportunity for growth (continued)

Focus	Description
Impact on places, including OAs: London Riverside, Thamesmead & Abbey Wood, Bexley Riverside, Charlton Riverside[138]	Data centre growth in these Opportunity Areas faces strong competition from major regeneration and infrastructure projects, including Beam Park station (delayed until 2027), The Factory District in London Riverside (around 3,500 homes plus modern industrial space), and town centre and employment land renewal initiatives in Bexley Riverside, such as the Greater Erith Programme, which aim to strengthen local employment and creative industries. This stems from the low employment rates in the selected OAs, with Thamesmead and London Riverside together recording only around 12,000 jobs as of 2023. Housing delivery is a dominant priority across these locations. Thamesmead has been shortlisted for the Government's 'New Towns' programme, with proposals for up to 15,000 homes at Thamesmead Waterfront. This nationally significant scheme depends on delivering the Docklands Light Railway (DLR) extension, now backed by Government, with construction expected to start in 2027 and opening by 2032. Together with large-scale housing at Barking Riverside, as well as Beam Park and the Factory District, these projects reinforce the strategic focus on residential growth and transport connectivity. Beyond housing and transport, the main competitor for land use is the retention and improvement of industrial land and creative/manufacturing uses, which remain priority sectors for these places. These areas sit along the Thames Production Corridor and Thames Innovation Corridor, where the growth agenda focuses on industrial innovation, creative industries, advanced manufacturing (including the Thames Freeport), food processing and logistics[208]. London Riverside, particularly Barking & Dagenham, is emerging as a major hub for screen-based industries and technology, driven by developments like Eastbrook Studios, the largest film studio complex in Europe, and associated creative clusters. Positioning data centres as enablers of these sectors through high-speed connectivity, integration with local supply chains, and community benefits such as heat recovery and digital inclusion, will be essential to ensure alignment with the vision for these corridors and avoid direct conflict with regeneration and industrial priorities.

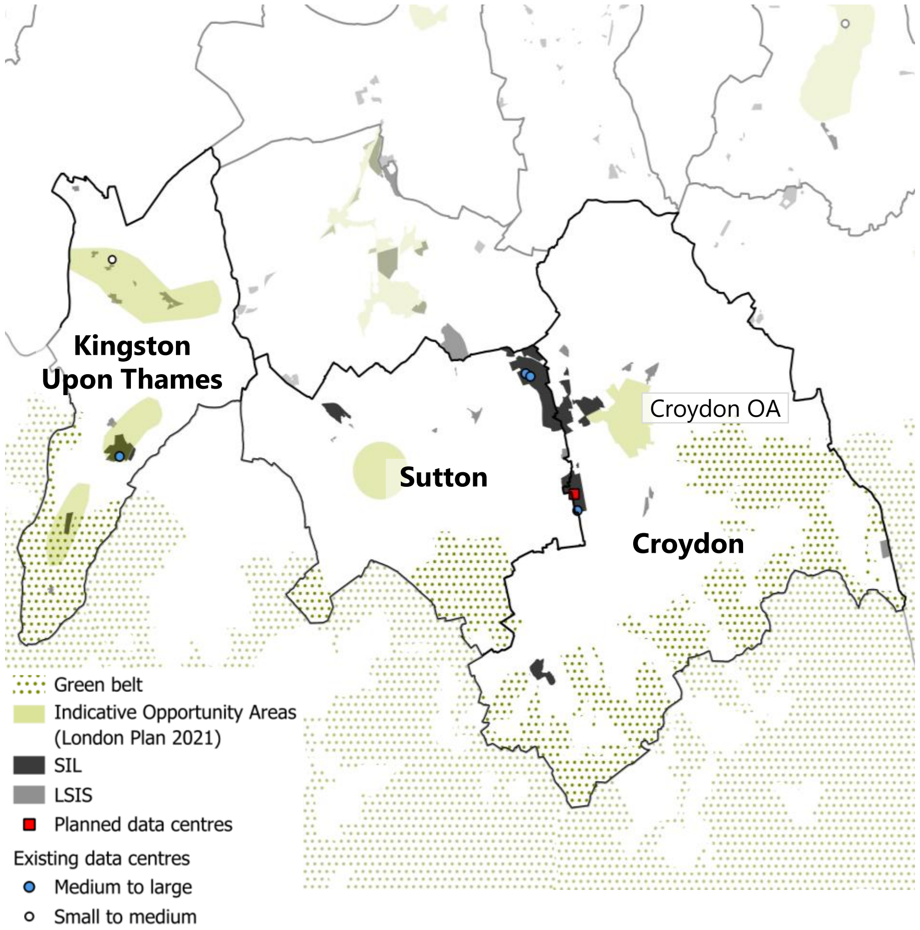
Figure 46: Data centre growth focus: East London



Scenario 2: Exploring South London as an emerging opportunity for growth

Focus	Description
Boroughs in focus	**Croydon, Sutton and Kingston Upon Thames** have a total of 5 operating data centres and 1 in planning. There is uncertainty relating to assigning Nation Grid connection queue capacity to the area and DNO queue capacity is limited to 0.05 GW.
Data centre demand outlook	This area may attract greater interest from colocation and hyperscale providers, with potential to establish a southern future data centre corridor linking this location to Heathrow.
Time horizon/ confidence	Medium to long term, with low confidence given limited South London activity to date.
Electricity infrastructure opportunities and risks	Currently grid infrastructure predominately serves residential and other mixed-uses. Industrial intensification has been emphasised in the Purley Way Masterplan along with major upgrades to transport and physical infrastructure. However, data centre development will need to come with planned grid upgrades. The Beddington substation (near the two existing data centres in North Sutton) means there is substantial electrical infrastructure in a key SIL location, which could aid data centre deployment.
Water infrastructure opportunities and risks	Waddon Water Treament Works and West Wickham Water Treatment Works from the 2025 Croydon Infrastructure Delivery Plan will ensure an adequate waste pumping system for improved resilience[146]. However, there are no planned projects that address the increase in water supply required with the adoption of data centres.
Land availability	The borough of Croydon has a low industrial land vacancy of 0.2%, with an average vacancy of 1.3% across the boroughs.

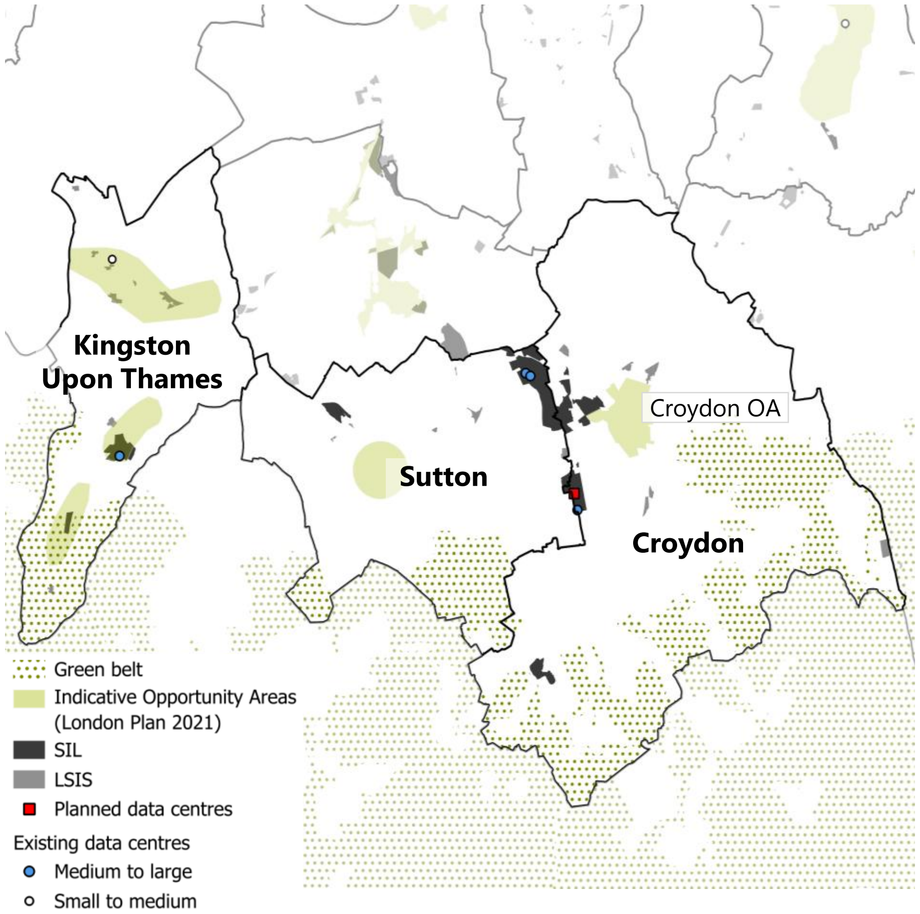
Figure 47: Data centre growth focus: South London



Scenario 2: Exploring South London as an emerging opportunity for growth (continued)

Focus	Description
Impact on places, including OAs: Croydon	The London Plan 2021 labelled Croydon as 'Ready to grow' and potential for 14,500 new homes and 10,500 new jobs by 2041[85]. This borough has significant economic potential with a focus on regeneration with key sectors being civic, culture retail, and being a Gaming & Immersive Tech Hub. Purley Way is a key driver of economic output and employment, with scope for industrial intensification and mixed-use development, making it a more plausible location for data centre investment[147]. Aligning data centre proposals with Croydon's economic strengths, particularly tech, creative industries, and advanced services, will be key to positioning them as enablers of growth rather than competing land uses.

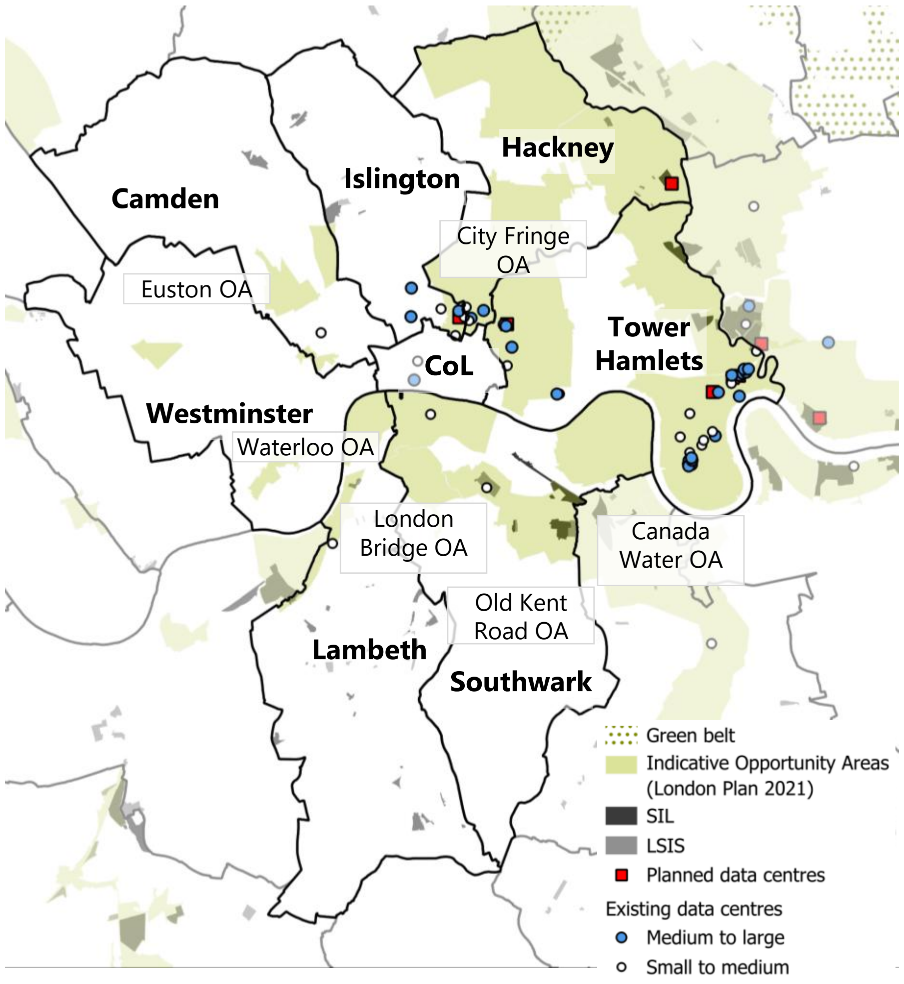
Figure 47: Data centre growth focus: South London



Scenario 3: Central London as a hub for edge data centre growth

Focus	Description
Boroughs in focus	**Islington, Hackney, Tower Hamlets, Camden, City of London, Westminster, Southwark and Lambeth** have 45 operational data centres and 5 in planning. Tower Hamlets is responsible for the 0.39 GW data centre capacity growth currently in the connection queue.
Data centre demand outlook	These boroughs are expected to see rising demand for latency-sensitive workloads, potentially attracting edge operators. This could reverse the trend of data centres relocating away from areas like Westminster, which once hosted historic facilities.
Time horizon/ confidence	Long term, with medium confidence.
Electricity infrastructure opportunities and risks	Substation upgrades in 2017 to Islington UKPN and St Pancras substations will provide headroom for future data centre growth of edge facilities. The North London Reinforcement Project will bring substantial increases in the area (reinforcing the network between Pelham and Hackney, which will help sustain further growth. Edge data centres are of a scale where they are **more likely to connect to similar voltage levels as seen by actions identified in LAEPs**, making strategic alignment and planning important to ensure capacity availability.
Water infrastructure opportunities and risks	The Beckton Water Recycling scheme, part of the wider London Water Recycling scheme by ofwat will contribute recycled water to local reservoirs, which will lessen the load on the local water supply due to data centres[126].
Land availability	These boroughs have limited land availability, creating opportunities for retrofitting existing structures. Their **concentration of offices and major university sites could support growth in emerging edge data centre development.**

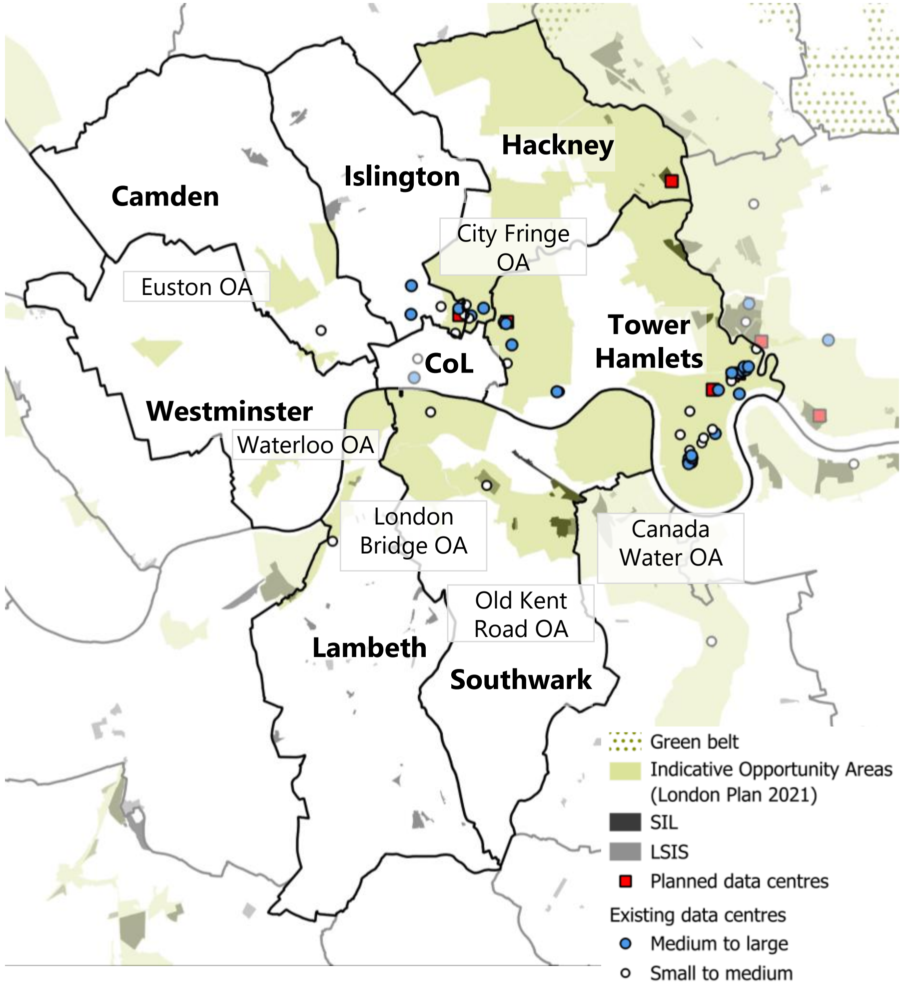
Figure 48: Data centre growth focus: Central London



Scenario 3: Central London as a hub for edge data centre growth (continued)

Focus	Description
Impact on places including OAs: City Fringe, Euston, Canada Water, London Bridge, Waterloo, Old Kent Road[138]	This region is a major economic hub where data centre development will compete with large-scale mixed-use and regeneration projects. The City Fringe OA includes schemes like Goods Yard in Bishopsgate, while Euston, designated as "Ready to Grow", is anchored by Camden's Knowledge Quarter, aiming to create a global hub for research and innovation by 2050[148]. Beyond these, this area hosts a diverse set of growth sector such as life sciences, the visitor economy, logistics and manufacturing, and creative industries and food production. The Bakerloo Line Extension, still awaiting funding, would unlock growth in Old Kent Road, increasing pressure on land. To secure a role in this landscape, **co-located edge facilities within mixed-use or industrial intensification schemes** should be explored, positioning data centres as enablers of connectivity, resilience, and heat recovery for these high-growth sectors.

Figure 48: Data centre growth focus: Central London



Appendix 6

Summary of References

Appendix 6: Summary of References (1/7)

Index	Reference
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End

Annex (June 2026): Update to Evidence Base - London's Data Centre Future Growth Forecasts and Strategic Insights (December 2025)

Purpose and Scope

This annex updates the evidence base set out in *London's Data Centre Future Growth Forecasts and Strategic Insights* (completed in December 2025), reflecting material developments that have occurred since the research was concluded. The London data centre sector continues to evolve rapidly, driven in particular by the progression of schemes through the planning system, changes in electricity connection queues, and emerging national policy and regulatory reforms affecting large demand connections.

This annex provides an updated position **as of June 2026**, on:

- The current **pipeline of planned data centre development** in London.
- The latest position on data centres in **London's electricity connection queues[1],** drawing on updated information from NESO, National Grid Electricity Transmission (NGET), UK Power Networks (UKPN) and Scottish & Southern Electricity Networks (SSEN)[2];
- New evidence on **data centre water usage** in the UK, including recent metered data analysis.
- Updated evidence on **gas connection interest** from data centre developers.
- **Emerging government policy and regulatory developments** relevant to data centre delivery and strategic demand connections.

The annex is intended to complement the main report by focusing on evidence published or made available from late 2025 which materially affects the ability to forecast data centre growth in London with confidence.

Key updates since December 2025

- **London's electricity connection queue for data centres has grown to ~11.2GW:** Demand in the connection queue has increased to ~11.2GW (c. +2.8GW since the baseline evidence cut), reinforcing that network capacity remains a key factor shaping delivery, alongside wider market and policy considerations.

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[1] Sequencing of the connections remains subject to Connections Reform outcomes and project development.
[2] The queue remains dynamic and subject to implications of wider connections reform, prioritisation, and connections policy that is being shaped through NESO, Ofgem and government processes.

This reflects requested or reserved capacity rather than confirmed delivery and is influenced by a combination of factors including connection queue dynamics, developer behaviour, policy reform, and network capacity across the wider electricity system.

- **Reserved capacity is increasingly shifting beyond established clusters:** New reservations are emerging outside core clusters (e.g. Enfield, Greenwich), indicating early signs of geographic broadening.
- **New evidence suggests water use is lower than previously assumed:** Metered analysis indicates lower average water consumption than earlier estimates, but with a highly concentrated distribution where a small number of sites account for a large share of usage and peak-day pressures remain critical.
- **Gas connection enquiries from data centres are increasing:** Reported increases in enquiries highlight emerging workarounds to the availability of firm electrical capacity, raising important decarbonisation and planning considerations.
- **Changing policy landscape will shape what is deliverable:** Ofgem/DESNZ proposed policy direction on reforms for demand connections and strategic demand will shape how quickly (and where) future capacity can realistically connect, affecting the confidence of forward forecasts[3].

Updated Data Centre Planning Pipeline

An updated review of the Planning London Datahub (May 2026) identifies 4 additional data centre schemes submitted and validated since September 2025. These comprise of:

- Two applications within the London Borough of Ealing[4] (of which one in the OPDC area has subsequently been resolved to grant subject to a section 106 agreement)
- 1 application in the London Borough of Brent[5]
- 1 application in the London Borough of Hounslow[6].

Taken together, these applications reinforce the continued concentration of new proposals in west London, particularly around the established clusters at Park Royal and Hayes. While this provides an important signal of ongoing development interest, it should be noted that the planning pipeline represents only those projects that have progressed to application stage and will not capture the wider volume of potential schemes reflected in electricity connection queue data.

In parallel, the LB Havering has recently conducted their formal consultation on the Digital Freeport Local Development Order (LDO) between 6 March to 12 April 2026[7]. The draft LDO seeks to permit up to a maximum of 340,000sq.m GEA of data centre use, alongside limits on potable water use for cooling (to not exceed

[3] NESO oversees the connection process, including implementing connection reform and queue activity, while NGET designs and builds the physical transmission infrastructure.
[4] Applications 253874FUL and 25/0196/FUMOPDC
[5] Application 25/3290
[6] Application P/2025/3669
[7] East Havering Data Centre Consultation | London Borough of Havering

62,560,000 litres per annum on full occupation)[8]. The accompanying Power Availability Report[9] includes redacted connection agreement variations with UK Power Networks, indicating a phased connection agreement for 160MVA by 31st December 2029, and up to 600MVA supplied by 31st December 2033.[10] This scale of reserved capacity is likely to account for a substantial share of Havering's contracted "pipeline" demand reported in UKPN's borough-level data, and represents one of the most significant individual proposals currently progressing through an alternative planning mechanism in London.

Implications for forecasting: The planning pipeline continues to point to cluster-led growth in west London, while the Havering LDO highlights the increasing role of alternative planning mechanisms in shaping London's future data centre capacity pipeline.

Electricity Connection Queue Update

Since completion of the baseline report (December 2025), the scale and composition of London's electricity connection queue for data centres have continued to change. Updated queue data made available separately from NGET (for transmission-connected demand only) and the distribution network operators: UK Power Networks (UKPN) and Scottish & Southern Electricity Networks (SSEN), indicate an increase in reserved capacity alongside early signals of geographic broadening beyond the most established data centre cluster areas.[11]

This section summarises the updated position as of April 2026, drawing on:

- Updated data provided by NGET on the transmission-level data centre connection queue for the London region (anonymised to Grid Supply Point)
- Updated connection queue data from UKPN and SSEN for data centres connecting at distribution level only (anonymised to Local Authority)
- New evidence on the composition of data centres in the connection queue nationally from NESO's Call for Input.

It is important to note that connection queue data represents reserved capacity and does not equate to deliverable capacity within a defined timescale; queue maturity and speculation varies significantly, and a proportion of projects may not progress to delivery. Sequencing of queues also remain subject to ongoing and continuing connection reform outcomes, as well as project development.

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[8] LDO documents - Google Drive
[9] Technical Assessments and supporting evidence - Google Drive
[10] These dates reflect the phasing referenced in the connection documentation and should not be read as confirmation of final delivery timing. Sequencing remains subject to project development, relevant connection processes and wider reform outcomes.
[11] NGET's data relates to transmission-connected demand and transmission network connection points, while UK Power Networks & SSEN data relates to distribution-connected demand within their licence areas.

Summary Connection Queue Position (April 2026)

Across transmission and distribution networks, the total electricity connection queue associated with data centres in the London region now stands at approximately **~11.2GW**.[12] This represents an **increase of around ~2.8GW** relative to the position used in the baseline report (based on DNO data from August 2025 and NGET data from September 2025).

This increase is broadly split between data centres seeking distribution connections and those seeking transmission-level connections. While the largest volumes of reserved capacity remain concentrated in areas associated with existing clusters, updated DNO data also shows new reserved capacity emerging in locations that were not previously prominent in the operational or contracted pipeline datasets, suggesting a widening of interest that is likely being shaped by a perceived accessibility of capacity, particularly in areas where available capacity or reinforcement requirements may make connection opportunities comparatively more attractive to developers.

Transmission-connected Data Centres Queue Position

Updated data on transmission-level data centre demand has been provided by NGET current to April 2026. The dataset reflects data centre applicants seeking connection at the transmission-level only and does not provide any insight into data centres currently connected to London's transmission network. The data aggregates connection agreement headline figures per connection site, which may be either existing Grid Supply Points (GSPs) or allocated to 'nodes' that are yet to be sited and built. These indicative pairings are used solely to support high level spatial interpretation of transmission connection data and should not be read as confirming final project locations, development boundaries or delivery decisions.

Since completion of the baseline report, key changes to the transmission connection queue position are as follows:

- The transmission-level connection queue for data centres in the London region now stands at approximately **~7.9GW**, representing an increase of around **~1.86GW** relative to the September 2025 position used in the baseline report.
- The increase is driven primarily by updated connection data for Uxbridge Moor GSP, alongside new connections registered at nodes in both the north and west of London.
- The emergence of additional reserved capacity in norther locations aligns with growing market interest identified in distribution pipeline indicators, suggesting increasing attention to London's northern periphery.

A visual representation of the updated transmission-level data centre connection queue is provided in Figure 1 below. The map shows aggregated reserved capacity by Grid Supply Point (GSP) and/or proposed connection node, based on NGET data current to April 2026 and the indicative pairings provided by NGET to support spatial visualisation. It should be interpreted as an indicative representation of where available capacity or reinforcement requirements may make connection

[12] Subject to implications of wider connections reform, prioritisation, and connections policy that is being shaped through NESO, Ofgem and government processes.

opportunities comparatively more attractive to developers within the transmission system, rather than a definitive indicator of where associated data centre developments will ultimately be located.

Compared with the baseline report, the updated map shows capacity now visualised around Barking GSP where previously it appeared around Warley GSP (further east). This reflects a change in the indicative pairing NGET has provided for a proposed connection node in the east of the London region, rather than evidence that the underlying connection offers have moved geographically. The indicative pairing is intended to support representation of node-based reservations against known network assets and should not be interpreted as confirming that the data centre developments associated with a proposed node in the east of the London region will fall within the existing Barking GSP service area.

Implication for forecasting: The increase in the transmission queue reinforces the scale of demand signals since the baseline report, but the use of node-based reservations and the potential for long-distance connection routes mean that spatial interpretation should remain cautious; forecasting should treat transmission queue growth as a strong demand indicator while explicitly accounting for uncertainty in project siting and deliverability.

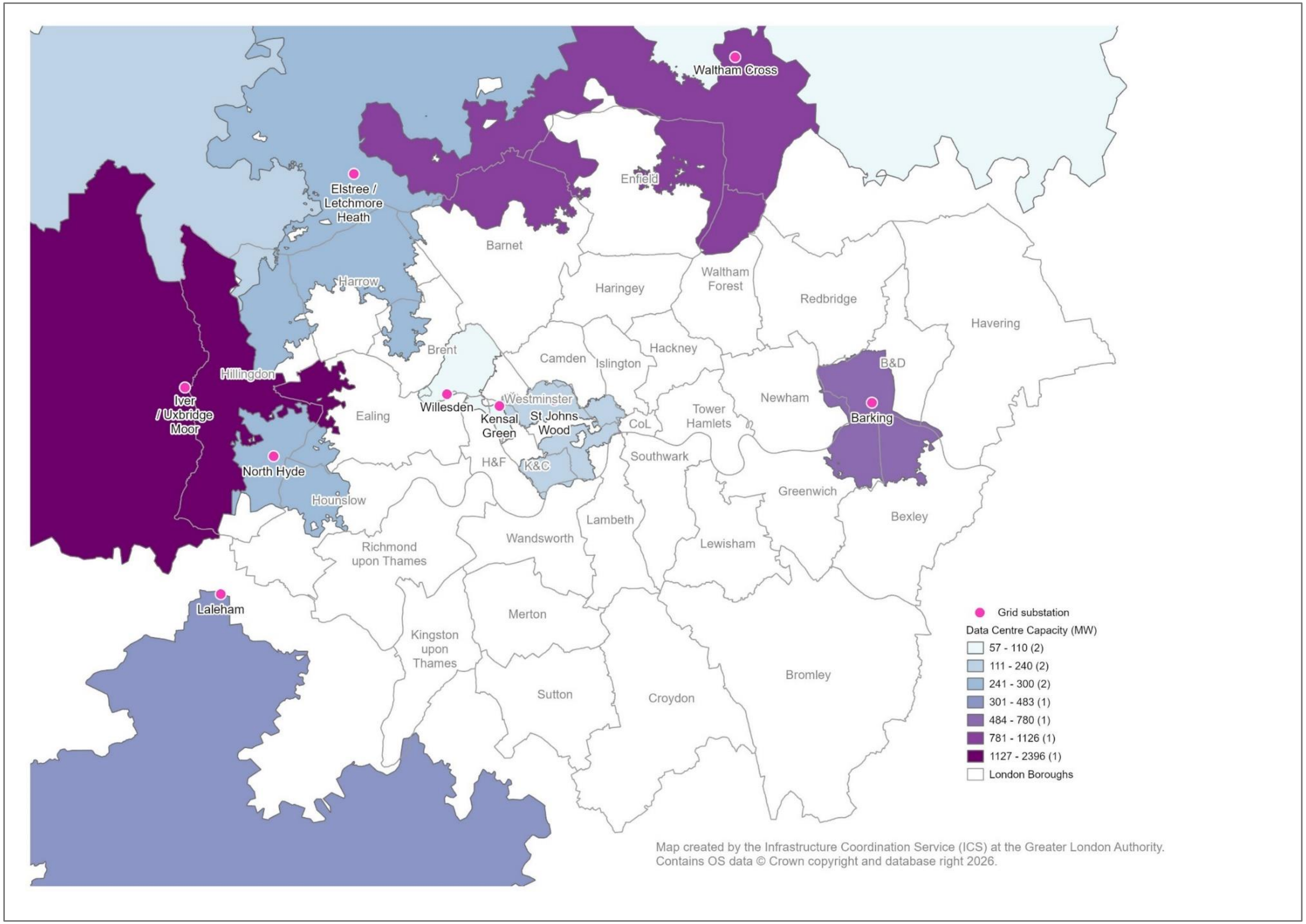

Figure 1 - Transmission-level data centre connection queue for London - based on aggregated data provided by NGET April 2026

Distribution-connected Data Centres Queue Position

Updated distribution-level data has been provided by SSEN and UKPN to the GLA current to April 2026. These datasets capture operational and contracted ("pipeline") data centre demand connecting at distribution level (i.e. via the DNO rather than directly to the transmission network) and were compared against the DNO provided datasets used in the baseline report (current to August 2025).

Overall, the contracted distribution-level pipeline in London has increased by approximately ~**1.18GW** over the period. The majority of this increase is reported within the UKPN license area, with SSEN reporting a smaller uplift (~50MW) of new contracted data centre demand capacity across Ealing and Hounslow.

UKPN's updated data shows a substantial increase of requested capacity in LB Enfield (a 450MW increase between August 2025 and April 2026). Additional increases are recorded in Brent (+190MW), Newham (+150MW), Tower Hamlets (+110MW).

Several locations have also emerged with new reserved capacity despite not previously featuring operational or contracted pipeline demand in the datasets used for the baseline report. This includes Greenwich (now 182MW of reserved capacity) and Bromley (50MW). Together, these changes suggest an expanding geography of interest for distribution-level capacity reservations beyond London's most established data centre clusters. This is especially notable for Enfield, which also aligns with increasing[13] development activity immediately north of London[14].

Figure 2 presents a borough-level comparison of operational and pipeline demand in the distribution queue between August 2025 and April 2026 (based on UKPN and SSEN data). The figure should be interpreted as an indication of where distribution-level capacity has been reserved by borough, rather than a definitive indicator of where data centre development will ultimately be delivered, noting that contracted capacity may not translate into built demand within a defined timescale. Figures 3, 4, and 5 provide a spatial visualisation of the operational and pipeline demand in the distribution queue.

Implication for forecasting: The increase in distribution-level reserved capacity (particularly in Enfield and the emergence of new boroughs such as Greenwich and Bromley) reinforces a geographic broadening of interest; forecasting should therefore treat distribution queue growth as both a demand signal and an indicator of potential spatial dispersion, while continuing to account for uncertainty in deliverability and the likelihood that not all reserved capacity will be realised.

[14] Google starts building £790m site in Hertfordshire - BBC News

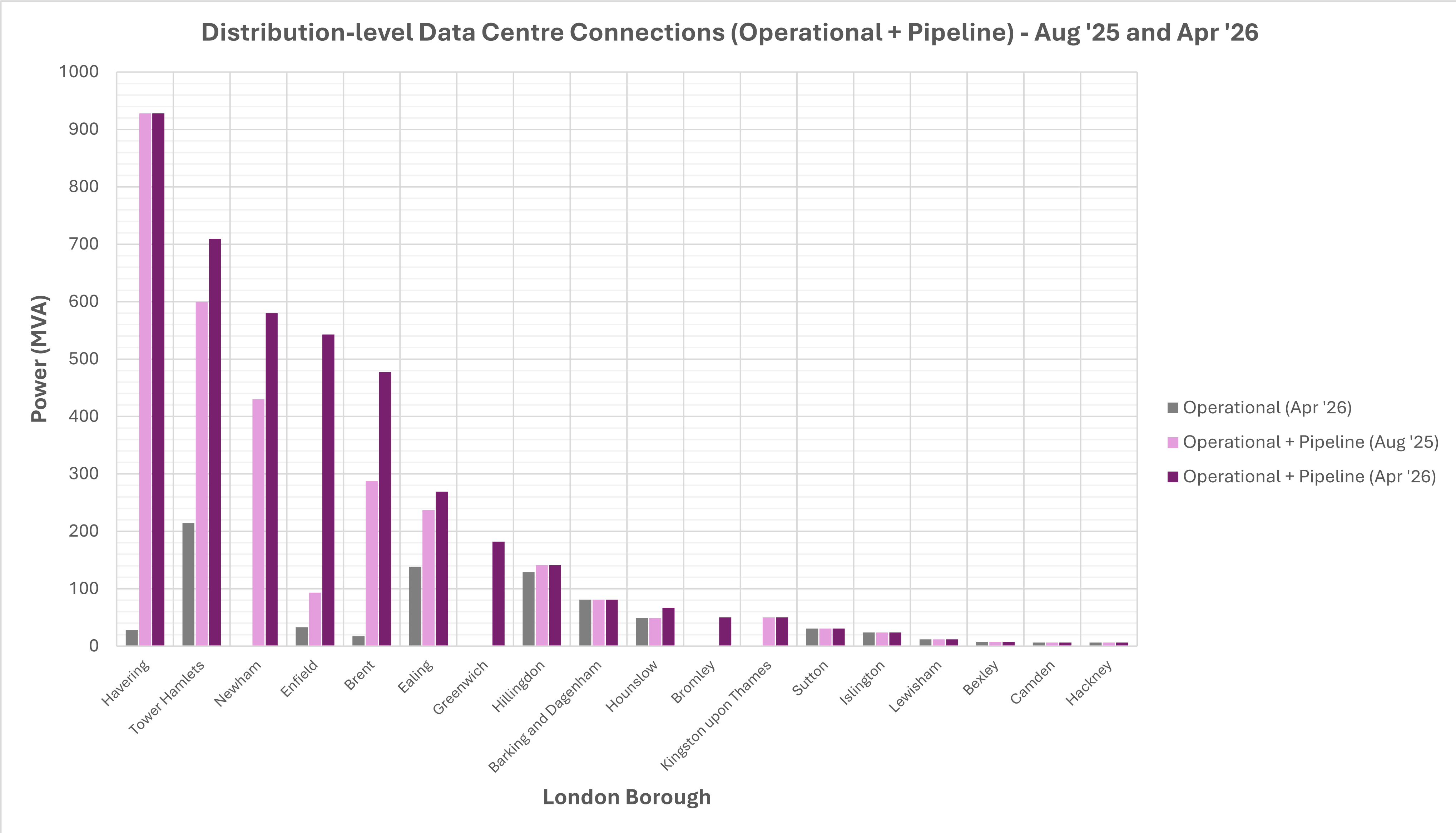

Figure 2 - London Distribution Connected Data Centres - Operational and Pipeline (Aug '25 and Apr '26) [Based on data provided by UKPN and SSEN]

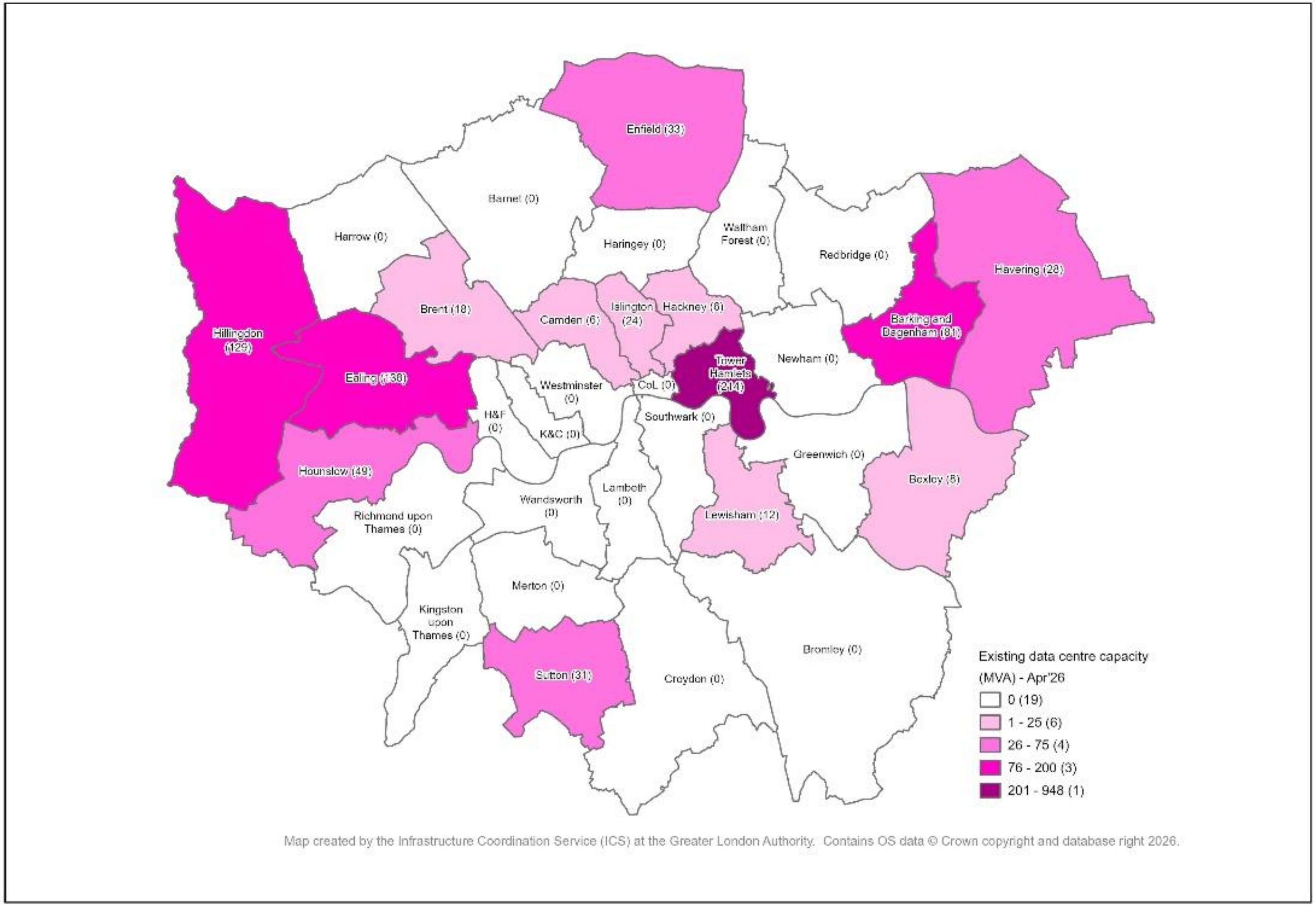

Figure 3 - Distribution connected existing data centre capacity (April 2026)

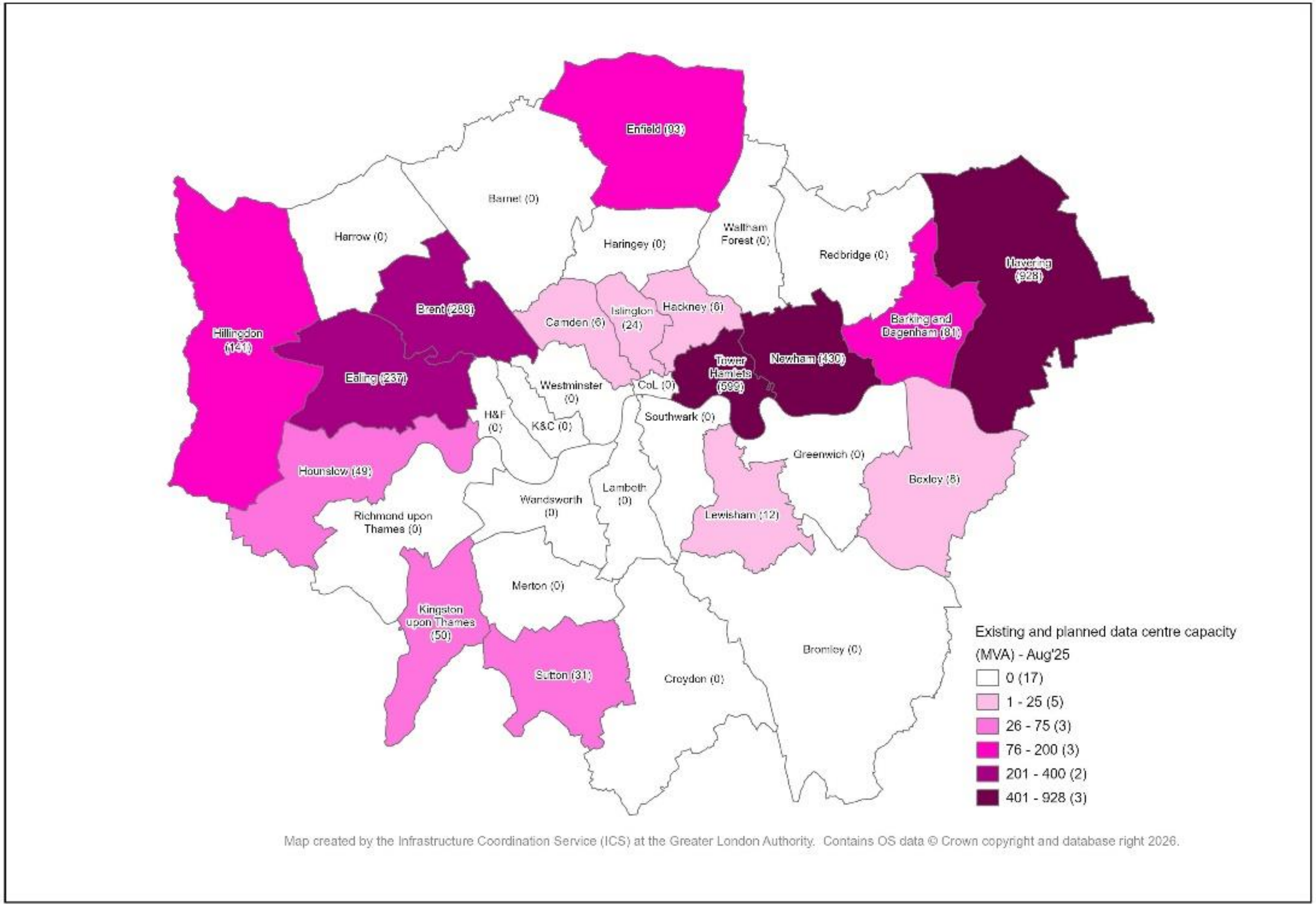

Figure 4 - Distribution connected existing and pipeline data centre capacity (August 2025)

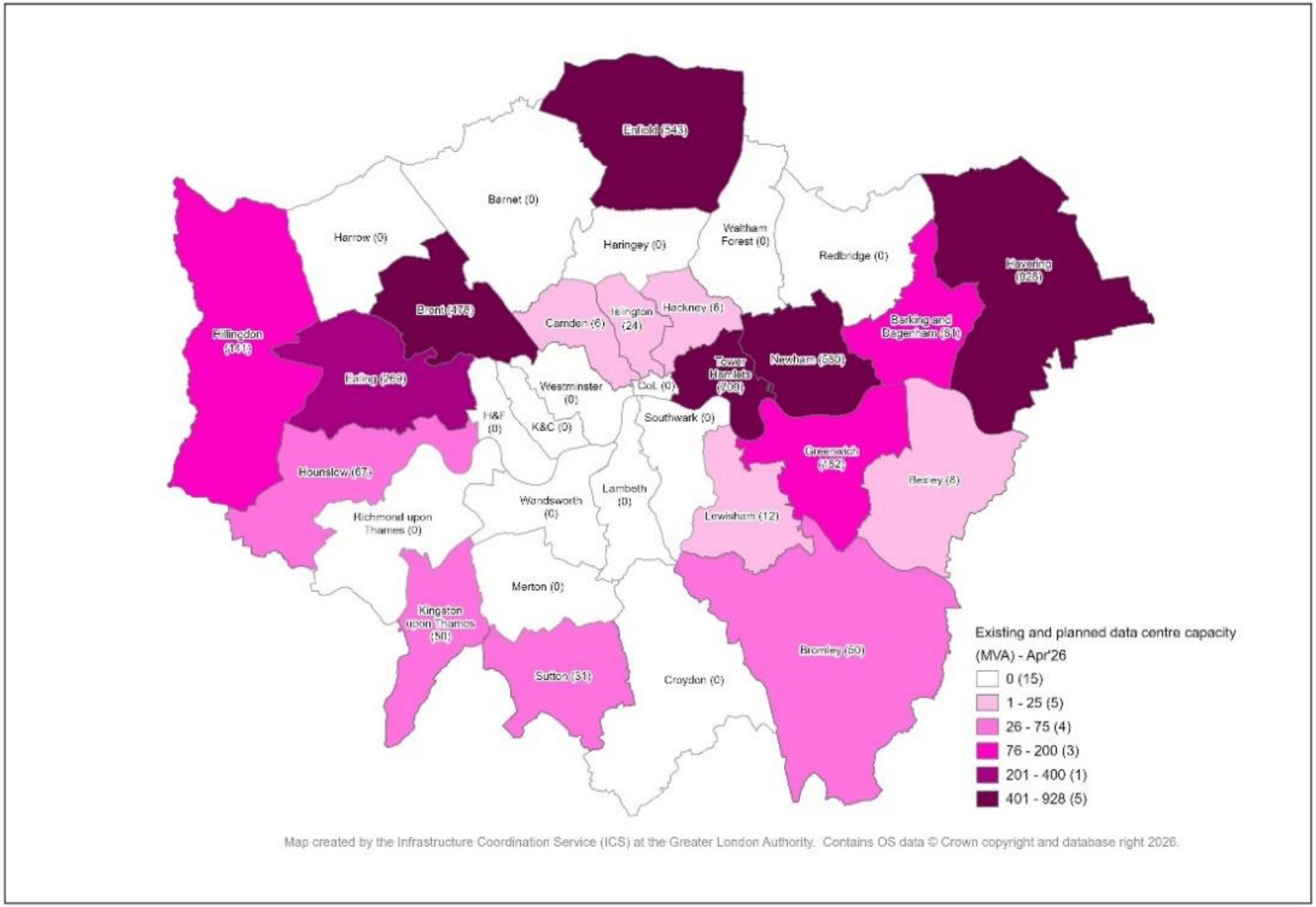

Figure 5 - Distribution connected existing and pipeline data centre capacity (April 2026)

Alignment with national trends

Since the baseline report was completed, additional national evidence has become available on the composition and maturity of the demand connections in the electricity queue, helping to contextualise London's updated connection pipeline figures. In November 2025, NESO undertook a voluntary Call for Input (CfI)[15] on the electricity demand queue. This was aimed at customers with an existing transmission-level demand connection agreement (including data centres looking aiming to connect directly at transmission level) as well as those with directly connected generation agreements that include demand technologies. This exercise was undertaken in parallel with Ofgem's statement on demand connections[16], which sets out expectations for reform and highlights the need for improved transparency and data quality across the queue, and the importance of distinguishing viable from speculative projects.

The published summary outputs of the CfI provide useful indicative insights into the varying maturity and readiness levels of data centre demand within the national queue, including:

- Data centres represent the dominant technology in responses to the CfI, accounting for ~50GW of demand capability in the queue.
- Only 32% of data centre projects have secured off-takers (customers for the data centres), with many indicating they were awaiting a firm grid connection date or that commercial negotiations remained ongoing.
- 9.3GW of data centre demand connections were recorded from the T11 transmission zone (which includes Greater London but also covers the wider South East).

While the T11 figure provides a useful order of magnitude cross-check, it should not be interpreted as directly comparable to the London-specific queue totals presented above. The CfI was voluntary and therefore not comprehensive, and it does not capture distribution-only demand from data centres seeking connections solely via DNOs. As such, differences between CfI totals and the more granular data provided directly by NGET, UKPN and SSEN are expected and do not necessarily imply inconsistency in the underlying trend.

NESO has since launched a mandatory Demand Information Request Notice (IRN)[17], issued between 11 March and 13 April 2026, to gather additional information and develop a more complete picture of the health and maturity of the demand pipeline.

Implication for forecasting: National evidence supports the conclusion that data centres now represent a substantial share of demand in the connections queue, but also highlights limited project maturity (e.g., low off taker certainty), reinforcing the need for scenario-based forecasting that explicitly accounts for attrition and the likelihood that a proportion of reserved capacity will not translate into deliverable demand on current timescales.

[15] Demand Queue Call for Input (CFI) | National Energy System Operator
[16] Demand connections update | Ofgem
[17] Demand Information Request Notice (IRN) | National Energy System Operator

Data Centre Water Use

New evidence published since completion of the baseline report provides a more robust basis for understanding data centre water consumption in the UK, reducing a key uncertainty identified in the December 2025 report.

The baseline report noted limited availability of observed water consumption data and relied primarily on water company planning documents and sector survey evidence, including Water Resources Management Plans[18], a Thames Water 2022 study on Data Centre growth[19], and a techUK self-reported survey of cooling approaches by existing data centres in the UK[20].

Thames Water's assessment of current water use by data centres within their network estimated figure of 130Ml/d potable water use in 2022 and forecast a 40% increase to 2035[21], but these estimates were not based on observed meter readings and the forecasts relied on assumptions of continuing reliance on traditional evaporative cooling systems, which require large volumes of potable water and generate substantial wastewater. This contrasted with the techUK survey evidence suggesting that over half of the 73 surveyed data centres used waterless cooling[22].

Since completion of the report, additional evidence has been published by Water Research Centre (WRc)[23] using aggregated metered water consumption data for a sample of 208 operational data centres in England, sourced via MOSL (the non-household water market operator). The WRc analysis provides a materially different view of baseline water demand:

- Total potable water consumption by data centres in England is estimated to be 1,879,000 m3/year, equivalent to 0.2% of NHH potable water use.
- Most data centres (67%) consume less than 1,000 m3/year (mean 217 m3/year). This is comparable with the annual water use of a 600 m2 office.
- A small number of larger data centres account for a disproportionate share of the demand: the top six data centres (3%) consume >50,000 m3/year (average 115,800 m3/year, comparable to a hospital with a floor area of 37,000 m2) and accounted for 65% of the total sector's water use.
- The analysis identifies an upward trend in average water consumption since the end of 2021 (ignoring seasonality), which may reflect a shift towards larger sites and/or higher density computing, although this does not imply that all new sites are water intensive.

Overall, this emerging evidence suggests that while some UK data centres can be significant potable water uses, this is not representative of the sector as a whole and average consumption appears far lower than previously assumed. However, the key strategic issue for water planning is less the annual volume of water

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[18] Water resources | Regulation | About us | Thames Water and Plans - Water resources management plan | Affinity Water
[19] Thames Water Data Centre Water Use Review 2022
[20] techUK Report - Understanding data centre water use in England
[21] Thames Water Data Centre Water Use Review 2022
[22] techUK Report - Understanding data centre water use in England
[23] Water Efficient Data Centres

required and more the potential for coincident peak demand during hot weather, when data centre cooling demand and domestic demand can increase at the same time.

Given the misalignment between water resource planning timeline and the pace of data centre development, there remains a risk that localised clusters of water intensive sites (particularly in water stressed areas such as London) could create pressure at peak times if not adequately anticipated through planning, design, and demand management.

Implication for forecasting: The new metered evidence supports a refinement of water demand assumptions (lower average use but higher concentration), suggesting that water constraints are most likely to be experience as localised, peak-day pressure risks rather than London-wide annual supply constraints. Forecasting would therefore have to differentiate between 'typical' sites and high intensity outliers and treat cooling technology choice as a key variable.

Data Centre Interest in Gas Connections

Since completion of the baseline report, evidence from the gas sector indicates a marked increase in engagement from data centre developers, driven in part by developer response to delivery timelines and long electricity connection lead times. Gas distribution networks report a growing volume of formal enquiries from data centre operators seeking connections for on-site gas-fired generation, either as a primary power source or as part of a hybrid energy strategy[24].

Recent industry evidence suggests that this trend is now material:

- Between August 2024 and July 2025, gas distribution networks recorded 86 formal enquires from prospective data centres (with 17 enquiries received in the quarter May-July 2025 alone)[25].
- Broader evidence from gas network operators indicates over 100 enquiries through 2024-2025, representing anticipated demand equivalent to over 20% of total annual GB gas throughput, highlighting the potential system-wide significance of this trend[26].
- Cadent (one of the GDNs supplying London) noted that it has received 15 enquiries from data centre proposals within Greater London. They have also stated that across their entire service areas, they have struck 9 connection agreements with data centre developers[27].

Cadent's network covers several of the key data centre clusters relevant to London, as well as major clusters outside the GLA boundary (including Slough). While the majority of these enquiries are initially intended for primary power supply, it is not yet clear whether they will eventually materialise into peaking or

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[24] Data Centre Energy Demand
[25] P.19 solving-the-ai-dilemma-report-april-2026.pdf
[26] Risks and opportunities to the sustainability of data centres in the UK | The Institution of Gas Engineers and Managers (IGEM)
[27] P.3 solving-the-ai-dilemma-report-april-2026.pdf

supplementary generation within hybrid strategies, resilience and backup generation, or interim arrangement while developers await electricity connections. It is important to note that like electricity, the gas network capacity needs to be planned for based on the peak load, regardless of initial or long-term use.

Available evidence suggests that this emerging interest is being driven by a combination of time, cost, and system availability factors:

- For a typical 100MW data centre, industry analysis suggests annual power costs using on-site gas generation could be around one-third lower than relying solely on grid electricity, particularly where electricity access is constrained or requires significant reinforcement.[28]
- Gas connections and associated generation assets (engines and turbines) are viewed are more readily deployable and flexible, and hence able to offer faster connections for firm power in the context of electricity grid constraints. Gas connections can typically be delivered within 12-18 months.[29]
- Developers are increasingly viewing gas engines as a multi-phase asset: capable of acting as a primary energy source in the near term and transitioning to a backup or resilience role from the mid-2030s onwards, as alternative low-carbon power solutions become viable.[30]

At the same time, increased potential gas use presents clear policy and sustainability trade-offs. Industry evidence suggests that in the UK, a 100MW data centre operating on fossil gas alone could produce almost three times the emissions of a data centre connected to the electricity network[31]. Renewable alternative such as biomethane and hydrogen are referenced as potential future pathways, but these remain at an early stage. Biomethane energy solutions for data centres have been subject to proof-of-concept pilots[32]. Direct access to hydrogen at scale remains a challenge, despite growing interest in using hydrogen to power data centres.

Implications for forecasting: Rising gas connection interest is an emerging signal of how developers may respond to long lead times, reinforcement requirements, and the currently availability of firm electricity connection capacity. This should be interpreted as a response to current system conditions. Forecasting and infrastructure planning should therefore treat on-side generation and hybrid energy strategies as increasingly relevant variable, while recognising the associated emissions and policy implications.

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[28] P.4 solving-the-ai-dilemma-report-april-2026.pdf
[29] P.3 solving-the-ai-dilemma-report-april-2026.pdf
[30] P.13 solving-the-ai-dilemma-report-april-2026.pdf
[31] P.22 solving-the-ai-dilemma-report-april-2026.pdf
[32] Pure DC Completes Europe’s First Successful Data Centre Biomethane Proof of Concept - Pure DC

Demand Connection Reform and Emerging Government Policy

Since December 2025, three major publications from Ofgem and Government have signalled an accelerated shift in demand connection reform, from a market-led 'first come' connections regime for demand towards a more curated and strategically prioritised approach for large demand (especially data centres). These proposals would affect both the reliability of queue data as a forecasting input and the likely deliverability of current pipeline capacity.

Publication	Key relevant points	Relevance to forecasting data centre growth in London
Ofgem Connections End-to-End Review	• In December 2025, Ofgem published its updated proposals on reforms to the electricity connections process, intended to improve the customer journey from "end to end" with changes that drive greater standards or service and timelier connections. • Draft proposals are organised into seven themes including visibility and accuracy of connections data, improved service standards, expectations on networks/NESO to meet connection dates, and improvements to offer quality/ambition. • Under the data theme, stakeholder feedback includes calls for a demand connections register (analogous to generation registers), more granular data, and more consistent data tools / standards.	• The proposals may improve the availability, consistency, and usability of demand-side connections data, which could strengthen the evidence base used to estimate pipeline scale and location. • May increase the reliability of assumptions on connections timelines and the quality of connection offers used within delivery scenarios. • Improvements to pre-application data visibility could influence developer location choice, which may impact spatial forecasting assumptions.
Ofgem Demand Connections Reform	• In February 2026, Ofgem published their Call for Input on the Demand Connections Reform, gathering stakeholder feedback on the proposed direction of travel for reforming the connections queue to distinguish non-viable projects and to ensure viable data centres can progress to connection in a timely manner. • Sets out a coordinated reform programme for demand connections built around three pillars: curate, plan, connect. • Identifies three core challenges: a large/growing queue with many non-viable projects, well-progressed projects slowed by queue composition and infrastructure lead times, and limited mechanisms to prioritise strategically important demand. • "Curate" options include a data centre specific financial mechanism and strengthened readiness requirements.	• Proposals may create higher attrition of non-viable projects from the queue, so any forecasting may need to adjust assumptions as to maturity. • Strengthened readiness criteria and financial commitment requirements may change the relationship between reserved and deliverable capacity, affecting near-term delivery trajectories. • Wide use of ramped/non-firm connections and self-build options could alter connecting timing assumptions (e.g., earlier energisation under different firmness conditions).

	• "Connect" includes proposals to enable self-build / ownership of HV assets and expanding non-firm/ramped arrangements. • "Plan" links to government prioritisation mechanisms, further set out in the 'Accelerating Connections for Strategic Demand' consultation.	
Accelerating Connections for Strategic Demand	• In March 2026, the Department of Energy Security and Net Zero (DESNZ) published its Accelerating Connections for Strategic Demand consultation, seeking input on proposed changes to the connections process to address speculation and prioritise future capacity for strategic demand, including data centres. • Proposes using powers in the Planning and Infrastructure Act 2025 to amend codes/methodologies/licences (and potentially agreements) to deliver changes at pace. • Considers queue management measures focused on data centres and prioritisation mechanisms to reserve / reallocate capacity for strategic demand. • DESNZ outlined the government's policy intent, including the incoming national data centre strategy which will introduce a strategically aligned process to manage connections for data centre projects, aligning data centre connections to regional infrastructure targets.	• Creates a forecasting sensitivity around policy-driven prioritisation, with connections outcomes likely to increasingly reflect strategic designation and prioritisation mechanisms rather than queue order alone. • Reservation and reallocation of capacity could change assumptions about the availability and timing of capacity in constrained areas, affecting delivery scenarios. • Queue management measures aimed at reducing speculative oversubscription may improve quality of queue data used in forecasting.

Implications for forecasting: Ofgem/DESNZ proposed policy direction on reforms for demand connections and strategic demand will shape how quickly (and where) future capacity can realistically connect, affecting the confidence of forward forecasts.

Conclusion

Overall, the evidence available since December 2025 reinforces the baseline report's central finding that electricity availability, and the wider regulatory and connections framework governing access to capacity, remains the central factor shaping the scale, pace and spatial pattern of data centre delivery in London. The estimated London data centre electricity connection queue has increased to ~11.2GW (c. +2.8GW since the baseline evidence cut), underlining the strength of demand signals but also intensifying questions around deliverability, timing and queue maturity.

At the same time, updated distribution-level data indicates an emerging pattern of reserved capacity appearing in additional boroughs beyond established clusters (including notable increases such as Enfield and new reservations in boroughs like Greenwich and Bromley), suggesting early signs of geographic broadening shaped by infrastructure constraints and perceived capacity availability.

New available evidence also reduces key uncertainties in the wider enabling-infrastructure evidence base. New research based on observed water consumption indicates lower average potable water consumption than previously assumed in parts of the evidence base, but with a highly concentrated distribution in which a small number of sites account for a large share of total sector water use and where the principal planning risk is likely to be coincident peak demand during hot weather, particularly in a water-stressed context.

In parallel, gas network evidence points to increasing enquiries from data centre developers exploring gas connections and on-site generation as a response to electricity constraints and connection delays, raising clear trade-offs between delivery certainty and decarbonisation outcomes.

Finally, the policy context has moved materially since late 2025: Ofgem and DESNZ reforms on demand connections and strategic demand signal a shift toward stronger queue management and prioritisation arrangements across the wider connections framework, which are likely to influence which projects progress, where capacity is available, and on what timescales.

Implications for forecasting: Taken together, these updates strengthen the case for maintaining a scenario-based forecasting approach for London that distinguishes clearly between:

- headline demand signals in the connection queue
- realistic, time-bound deliverability under network, policy and market constraints.

Future updates should continue to track:

- queue reforms and attrition effects,
- the spatial distribution of reserved capacity (including new boroughs),
- evolving cooling technology and peak-day water risk, and
- the extent to which hybrid strategies (including gas) become embedded as a delivery pathway in constrained areas.