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SOLVING THE AI ENERGY DILEMMA

Unlocking green gas networks to power AI at pace

Supported by Cadent

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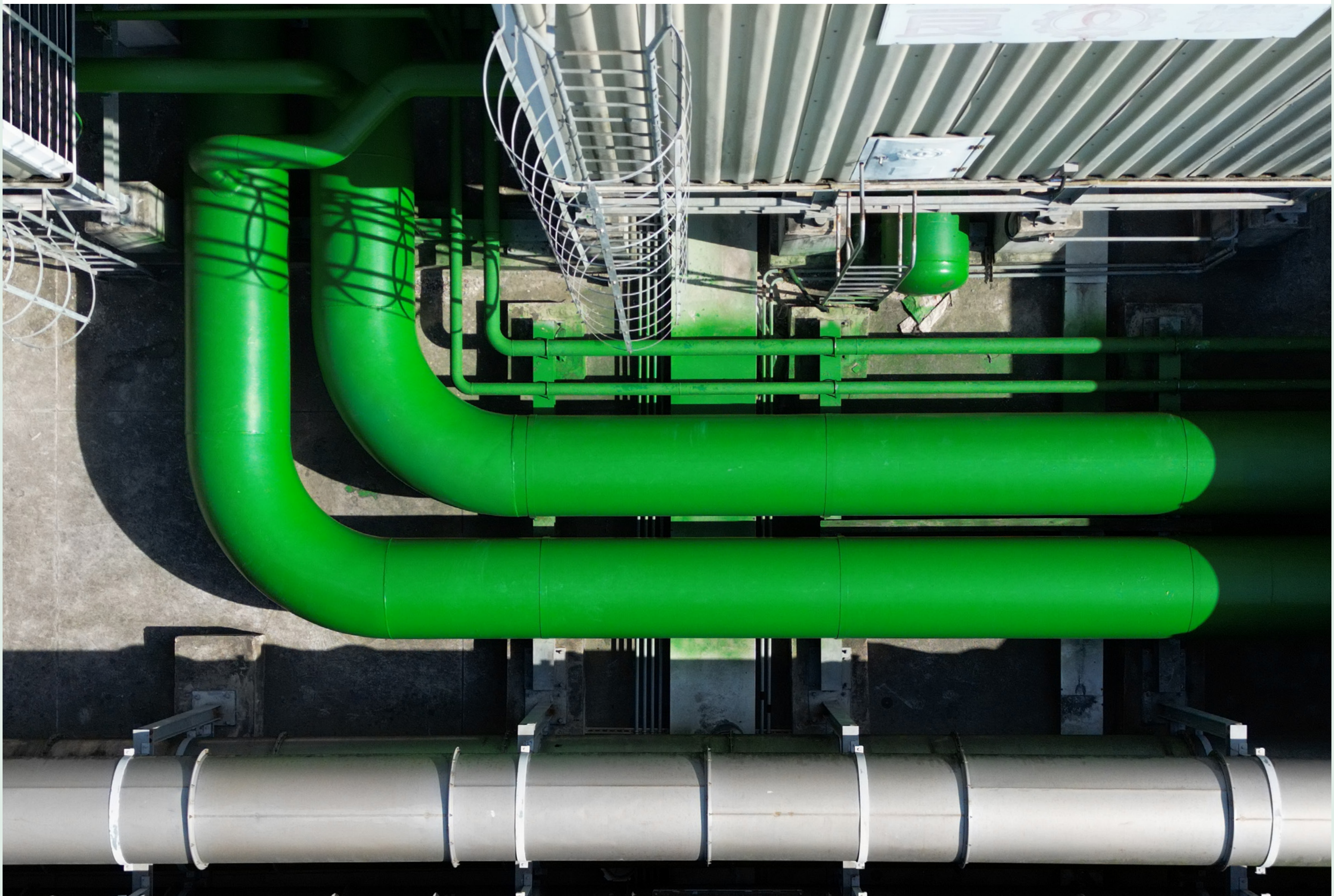

Contents

Foreword

Artificial intelligence is already reshaping the UK economy. It is improving how businesses operate, accelerating scientific discovery, strengthening national security and helping public services deliver better outcomes. Demand for AI infrastructure is growing rapidly. Global spending on AI has doubled in the past year alone, and the UK has set out an ambition to be one of the world's leading AI economies.

Delivering that ambition requires physical infrastructure. Data centres must be built at scale to provide the computing power that AI relies on. Many of these facilities need to be located close to major population and economic centres so they can deliver real-time services with minimal delay. That means they must also secure large volumes of reliable power in locations where electricity networks are already under significant pressure.

The Government's AI Growth Zones illustrate the scale of this challenge. Each zone must demonstrate access to at least 500 MW of power capacity, yet electricity grid connection timelines in some areas can stretch over a decade. Without practical alternatives, these constraints risk slowing the deployment of the infrastructure that underpins AI growth.

The gas network is already helping to address this challenge. Over the past year Cadent has struck nine connection agreements with data centre developers, with gas expected to begin flowing to some of these projects in the coming months. Across the industry there have also been around 86 enquiries from prospective data centre operators exploring gas connections as a route to secure reliable power.

This highlights an important reality. The gas grid is not simply legacy infrastructure. It is a strategic national asset that enables the rapid deployment of AI infrastructure while electricity networks expand.

A low-carbon pathway already exists within that system. Cadent has 47 biomethane producers connected to its network, with more projects under development. Produced from organic waste and agricultural feedstocks, biomethane delivers major lifecycle emissions reductions while strengthening domestic energy security and supporting rural economies.

Expanding biomethane production enables reliable power for new infrastructure while continuing to decarbonise the energy system. It provides the practical route to support AI growth and net zero together.

Howard Forster
Chief Operating Officer
Cadent

01

Executive Summary

"The biggest risk to our country is in not embracing artificial intelligence—if we do not take the opportunities it offers." - Baroness Sherlock[1]

Without a dramatic expansion in energy supply, the UK's AI growth will stall. This would compromise Government plans to expand AI-enabled data centre capacity from 0.5 GW in 2025 to 6 GW by 2030.

This is economically and strategically significant. AI underpins productivity growth, public service reform, defence capability and sovereign resilience. It supports NHS diagnostics, national security, financial services and advanced manufacturing. In a more competitive geopolitical environment, domestic computing power is a strategic asset.

Each additional GW of AI capacity could add £2.94 billion in annual GVA, at a time when the UK is desperate for growth. But this growth depends on infrastructure that can be delivered quickly and affordably.

6 GW of AI demand would require energy equivalent to powering several million homes. The electricity grid is already under immense pressure, with some players being offered connection dates more than 10 years away. UK electricity prices are also significantly higher than those of many European competitors. Long delays and high costs are pushing developers to consider alternative locations.

An electricity-only strategy risks slowing AI deployment, offshoring growth, and reducing sovereign capacity for public sector and defence applications.

Developers are responding pragmatically. Between August 2024 and July 2025, there were 86 formal enquiries to gas distribution networks from prospective data centre operators. Gas connections can typically be delivered within 12–18 months.

The gas grid already exists at scale. In many cases, it can currently offer faster connections, firm power and lower upfront system costs. For a typical 100 MW data centre, annual power costs using on-site gas generation could be roughly one-third lower than relying solely on grid electricity. Meanwhile, this demand can also support gas network decarbonisation, lowering the carbon intensity of remaining industrial and domestic gas uses through biomethane.

Biomethane - produced from organic waste and off-season crops - can reduce lifecycle emissions by up to 70% compared with fossil gas. The UK has enough domestic resources to produce 50 TWh by 2030 – well beyond projected demand from data centres. Data centre demand could act as an anchor customer for biomethane production and injection, reducing the carbon intensity of the homes and businesses which remain connected to gas.

The choice is not between electricity and gas, but between delay and flexibility. Used strategically, the gas network can relieve today's energy crunch, buying time for electricity infrastructure to expand without risking supply for critical infrastructure.

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[1] Hansard, Jobs Market debate, 13 November 2025

Methodology

This paper was commissioned by Cadent and produced independently by Stonehaven Global Holdings (SHGH). Our approach combines desk-based policy and market analysis with over a dozen in-depth interviews conducted between October and November 2025. Interviewees included data centre developers, gas network operators, biomethane producers, nuclear developers, energy system planners (including the National Energy System Operator), and industry bodies. These interviews were conducted on a non-attributable basis.

Policy Recommendations

To align AI growth with energy security and net zero, the Government should:

1. **Align energy planning with AI growth targets.**

NESO and the AI Energy Council should incorporate a clear AI growth scenario into Future Energy Scenarios 2028, including the role of behind-the-meter supply.

2. **Plan based on what can and cannot be relocated.**

Develop a robust approach to assessing data centre demand flexibility, distinguishing relocatable loads from those that must cluster near users.

3. **Embed AI demand in national and regional network plans.**

Apply these assumptions consistently across the Strategic Spatial Energy Plans, Centralised Strategic Network Plan, and Regional Strategic Energy Plans to bring forward investment and reduce delivery risk.

4. **Treat the gas network as enabling infrastructure in the 2020s and 2030s.**

Update the Strategic Policy Statement to Ofgem to reflect the role of gas networks in supporting near term AI deployment.

5. **Ensure gas is represented in AI energy governance.**

Include gas network participation within the AI Energy Council and reflect gas demand within its advice and analysis.

6. **Enable targeted anticipatory investment in gas networks.**

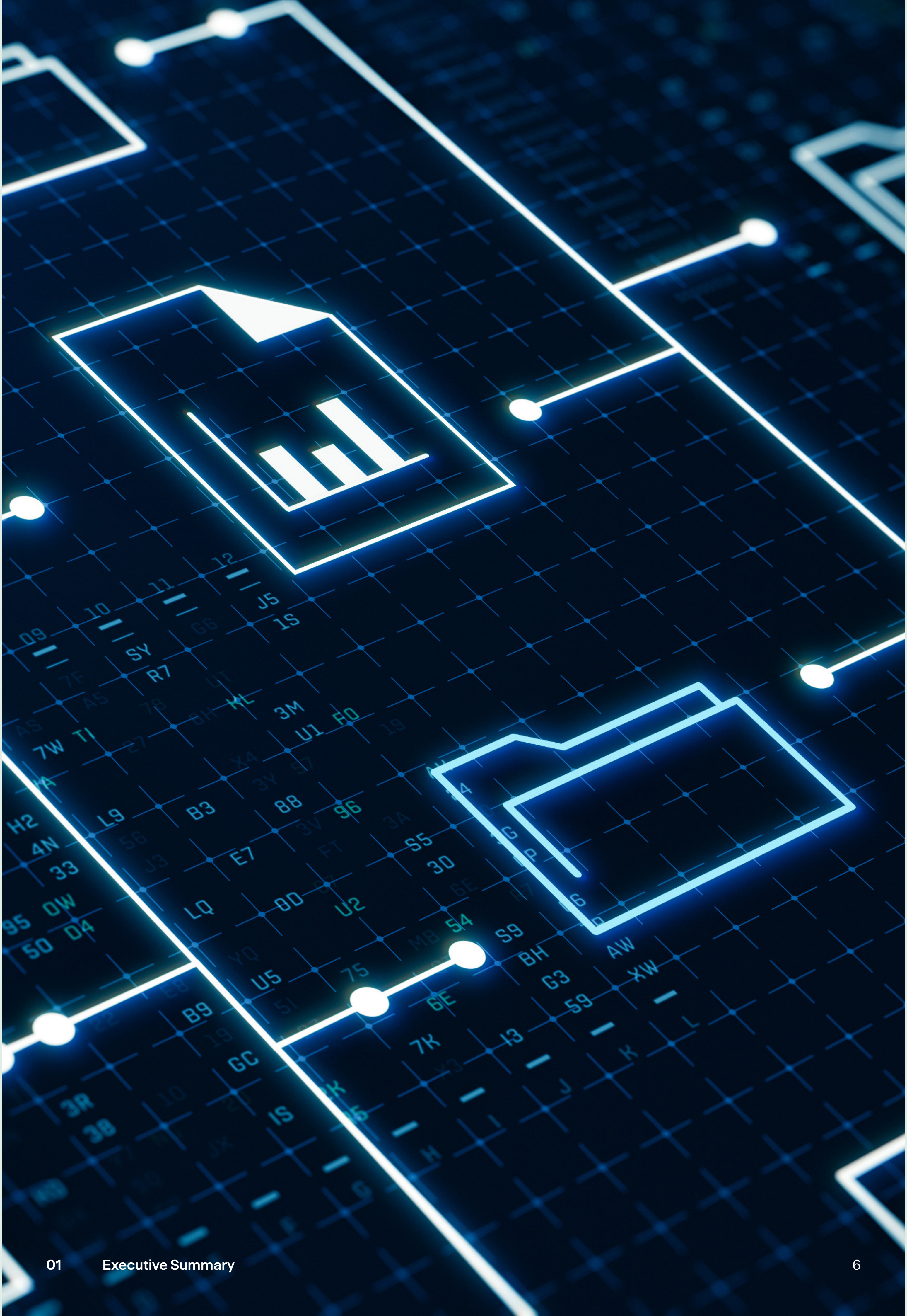
Reform RIIO 3 to fund essential preparatory works where credible data centre projects exist, with strong consumer safeguards and use it or lose it protections.

7. **Put in place a credible decarbonisation pathway for gas powered AI.**

Establish a ratcheting approach to increase biomethane supply to meet data centre gas demand, beginning with transparent monitoring and escalating only if necessary.

8. **Remove barriers to scaling biomethane quickly.**

Extend UK ETS recognition to biomethane injected into the grid, fast track consenting for major projects, and unlock sustainable feedstocks through clear sustainability thresholds.



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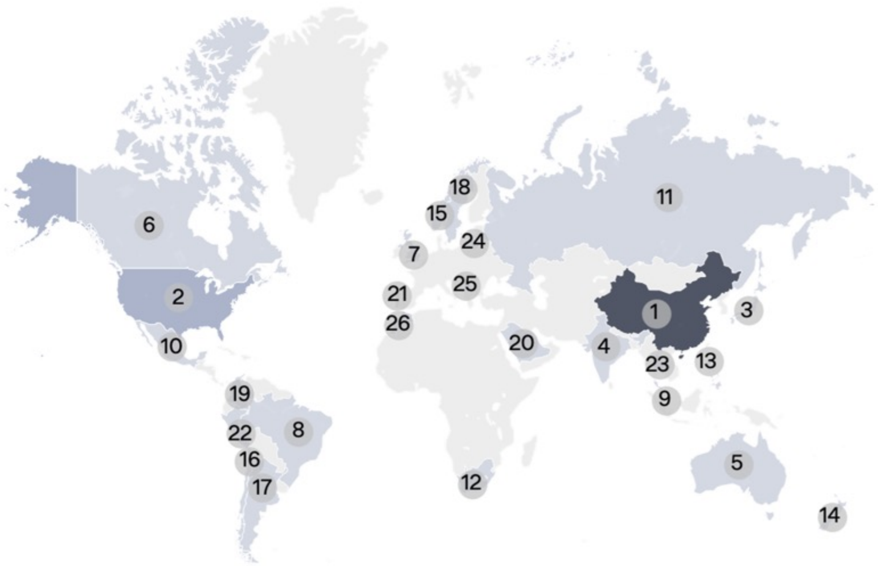
Grid constraints are growth constraints

AI is now a physical infrastructure challenge. The UK's ability to grow AI depends on whether it can deliver power, in the right places, fast.

The AI opportunity cannot be overstated. Each GW of AI capacity can add £2.94 billion to the economy (GVA) every year, and leading AI firms have been valued in the billions of dollars.[2,3] With AI poised to boost productivity across the economy, public sector, and defence, falling behind in the global race would mean ceding future UK jobs, intellectual property assets, and strategic capabilities to global competitors (see Figure 1).[4]

Figure 1.
Global patent landscape



Country rank		Patents
1	China	817,821
2	United States	225,513
3	Japan	66,667
4	India	30,928
5	Australia	9,548
6	Canada	8,913
7	Great Britain	4,308
8	Brazil	2,749
9	Singapore	2,525
10	Mexico	1,579
11	Russia	1,355
12	South Africa	459
13	Philippines	457
14	New Zealand	373
15	Norway	259
16	Chile	205
17	Argentina	201
18	Sweden	161
19	Colombia	136
20	Saudi Arabia	114
21	Portugal	104
22	Peru	72
23	Thailand	43
24	Lithuania	26
25	Republic of Serbia	24
26	Morocco	18

Source: Insights by Grib

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To secure sovereign AI capacity, the UK will need to support both 'training' and 'inference'. These are two distinct activities, with different – but related – energy and infrastructure requirements.

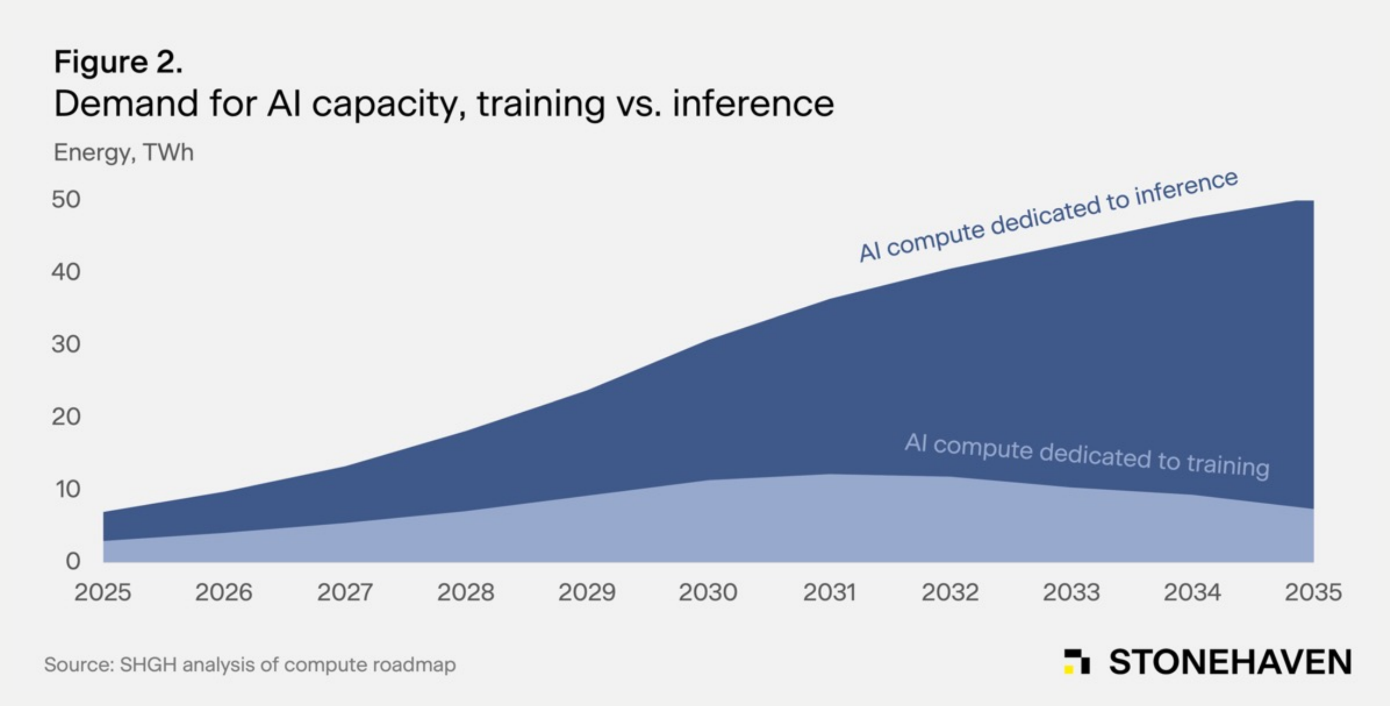
Explainer: AI training vs. inference

AI involves two distinct activities: training and inference, with different implications for energy and location.

AI training uses large data centres to build and refine models, often in hyperscale "AI factories". On one hand, it is energy intensive. OpenAI's third ChatGPT update required around 1,287 MWh, equivalent to roughly 90 UK households' annual consumption.[5] On the other, training demand is relatively flexible. Workloads can be paused or shifted to take advantage of lower-cost power, and there is no latency requirement, allowing training to locate almost anywhere. As a result, training is more price-sensitive and exposed to international competition. Today, it accounts for around 42% of demand for UK AI-enabled compute capacity.

AI inference, by contrast, delivers real-time services using pre-trained models and must often operate continuously and close to end users. As one major co-location customer noted, "you allow basically 5 minutes of downtime across the whole year." Inference workloads typically have limited ability to flex demand or relocate in response to energy prices, especially for time-critical activities. Today, inference occupies 58% of UK AI compute demand and is expected to rise to 85% by 2035 as deployment outpaces new model training (see Figure 2).[6]

Figure 2: Demand for AI capacity, training vs. inference | Source: SHGH analysis of UK Compute Roadmap



[2] Tech UK, Powering the Digital Future, 27 March 2025

[3] CNBC, AI Effect article, 20 September 2025

[4] GreyB, AI Patent Landscape, 29 December 2025

[5] Contrary Research, How much energy will it take to power AI?, 11 July 2024

[6] DSIT, Compute Evidence Annex, Jul 2025, p. 9.

AI growth is already an energy problem

> “...from our perspective, like any [energy solution] beyond 2027, it’s just not something [we’re] very interested [in] at the moment... we need it now, not in 2029 or wherever.” – AI operator

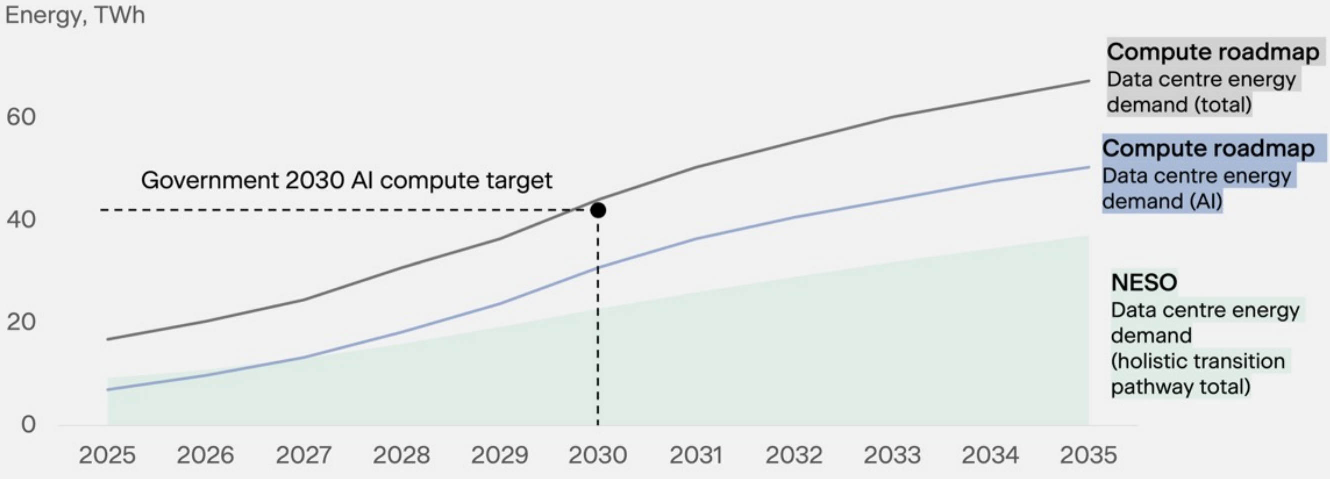
To unlock AI growth, investors need a clear pathway to energy connections at the scale, location, and (critically) at the pace required by investors. During our research, interviewees confirmed that this is time-sensitive, with many investments needing to deliver returns (and thus secure connections) well ahead of 2030 – or risk pulling out of the UK.

On the one hand, the Department for Science Innovation and Technology (DSIT) has recognised this opportunity. This is reflected in DSIT’s ambition to grow AI compute capacity from 0.5 GW in 2025 to 6 GW by 2030 – a ‘moderate’ scenario compared to its own investment forecasts.[7] This includes working across departments to unlock access to energy connections – the most significant barrier to AI development.

On the other hand, future energy system modelling – which guides decisions on generation and distribution – does not fully capture this scale. The gap between data centre demand in the National Energy System Operator’s (NESO’s) ‘Holistic Transition’ pathway, and the Government’s own growth forecast for compute demand (including AI compute), illustrates this (see below).

Figure 3.

NESO vs. UK Compute Roadmap moderate data centre demand projections



Source: SHGH analysis, see Annex

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6 GW of AI capacity is equivalent to more than 10% of the UK’s 2024 Average Cold Spell (ACS) demand (58.3 GW), which is used for resilience tests, and is greater than the generation capacity of Sizewell C.[8,9] This would require significant increases to electricity grid capacity.

This is especially relevant for AI-enabled data centre investment, which requires large volumes of power, within relatively short timeframes, and often in specific locations. If the Government does not fully prepare the system to deliver energy in the volumes and locations at which it is needed by the sector, it could severely compromise the UK’s AI growth potential.[10]

Grid constraints are a critical risk

“Timely connections to the electricity grid for AI data centres is the single biggest blocker for establishing AI Growth Zones” – Delivering AI Growth Zones, DESNZ, 2025[11]

Without capacity when and where it is needed, hundreds of GW of generation and demand capacity sit stuck in the UK’s transmission queue.[12] This can prevent critical infrastructure, such as railways, hospitals, and housing developments – as well as AI compute – from connecting to the grid.

For data centres that need to be close to population and demand hubs – where capacity constraints are greatest and grid upgrades are often slow – this introduces significant uncertainty. Without clear assurances on the timing of grid connections, investors may question whether projects can deliver value within expected timelines.

Why do data centres cluster?

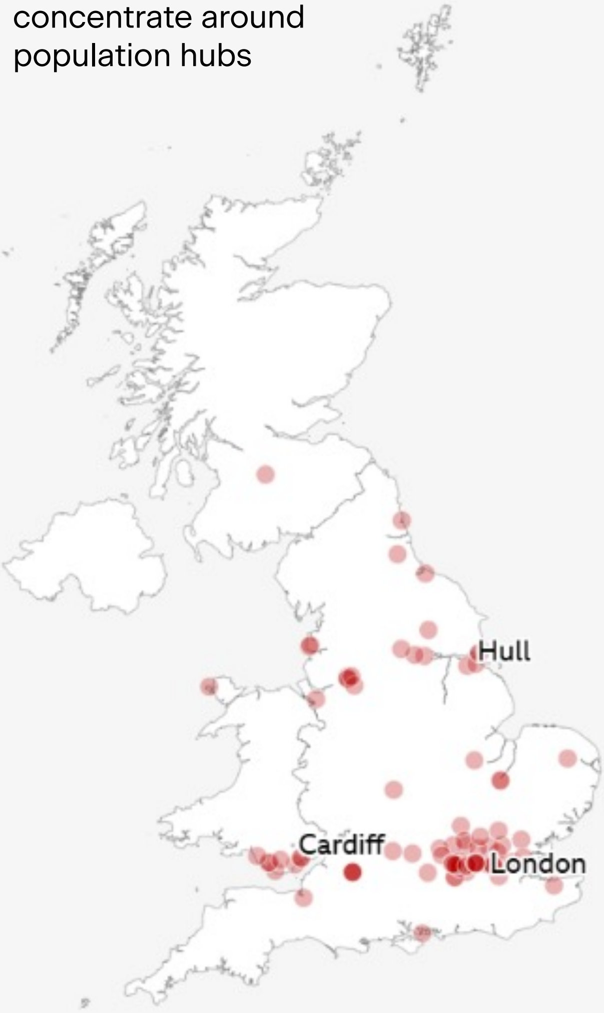
In many cases, AI compute cannot simply relocate to less constrained locations within the electricity grid. This is because of the ‘cluster effect’, or the investment pull of co-locating data centres in areas of existing demand. This is for both demand- and supply-side reasons.

On the demand side, the closer the data centre is to its end-user, the quicker it can deliver results, when used for inference (decision making). This is known as ‘low latency’. While the requirement for low latency differs across different AI inference activities, it can offer a significant performance and economic advantage for activities like financial services or surgical decisions, in which milliseconds affect profits or lives. Additionally, quicker results can also improve user experience, allowing operators to sell their services at a premium. Together, this helps to explain the high volume of data centre connection requests near population and economic hubs (see Figure 4).[13]

Beyond latency, clustering allows data centres to access supply-side benefits. Workforce is a particular challenge for data centres the world over, which must attract highly skilled talent.[14] Access to a highly skilled talent pool offers developers and operators a significant competitive advantage. By opting to develop in clusters, developers can unlock access to an existing talent pool and limit the need to upskill or relocate employees – which is often a significant barrier to recruitment. In addition to recruitment, clustering allows cost-sharing of infrastructure, including fibre reinforcement.

While the UK’s cities offer a significant investment pull in low-latency, skilled workforce, and access to network infrastructure, this opportunity remains constrained by the electricity system.

Figure 4.
Planned UK Data Centres concentrate around population hubs



Source: Barbour API

Connections reform is not enough

On one hand, the Government understands that electricity grid constraints risk undermining AI growth, including its flagship AI Growth Zones.[15] This is a significant reason for NESO's connections reform programme, which looks to remove 'zombie projects' from queues, and enable quicker connection times for the most strategically important projects – including data centres.[16,17]

On the other hand, connection reform is not set to deliver enough capacity where it is needed.

Under its new connection delivery pipeline, NESO budgets just 13GW of transmission connection demand for 2030 – across the whole country.[18] This will need to cover all industrial connections to the transmission grid, from hydrogen production to green steel, to other large-scale developments like housing.

Similarly, NESO's methodology for its 2030-2050 Strategic Spatial Energy Plan (SSEP) may not accurately reflect the need for data centres to connect to the grid in specific locations. Under its existing methodology, NESO models that 1-2GW of predicted data centre energy demand could relocate in response to policy signals – such as cheaper electricity, or speedier grid connections.[19] While relatively small, this figure doesn't incorporate sensitivity testing around data centre demand. Additionally, it does not incorporate the Government's AI opportunities action plan, as timelines are not compatible. While NESO has committed to "exploring other opportunities" to incorporate evidence on data centre demand into system planning, this does not mean that, at present, modelling necessarily reflects the demand profile of the AI activities the Government expects the UK to adopt.[20] In short, NESO's predictions on how data centres might relocate in response to energy signals (and to relieve grid pressure) are exposed to significant change.

System costs are a critical risk

To accommodate AI demand when and where it is needed, the electricity system could need upgrading beyond even the most ambitious of electricity system scenarios.[21] This is not just practically unlikely, but politically and economically unfeasible. To achieve NESO's most electricity-abundant scenario (the 'electric engagement' scenario), the UK would need to spend up to an additional £13.5 billion in 2026 alone, just on Capex in the power system.[22] Critically, this is a further £4.84 billion beyond the less expensive 'holistic transition' scenario, through which net zero is still possible (assuming, however, reduced electricity capacity for industry).

Beyond requiring additional network upgrades (which can be slow), this cost would need to be passed on to consumers. Already, UK consumers face some of the highest electricity costs in Europe. Between January 2025 and June 2025, UK household energy prices averaged 29.74p/kWh, compared to the UK+EU median of 21.06p/kWh over the same period - a 41.2% discrepancy.[23] Furthermore, over the same time period, very large industrial users in the UK paid 108.7% more than the UK+EU median - 22.39p/kWh compared to 10.73p/kWh.[24] Since 2021, high electricity prices have reduced UK energy intensive manufacturing GVA by one-third.[25] At a household level, any increase in bills is likely to face significant political backlash – especially if consumers feel they are being forced to subsidise the private sector's growth. This is already being witnessed in the United States, where campaign groups from both sides of politics are blocking data centre growth, due to its perceived impact on local energy bills.[26]

Given these economic and political risks, it is significantly more likely that the Government will pursue a more gradual transition. Under this trajectory, the electricity system would not possess sufficient capacity to accommodate data centre growth when it is needed.

Behind-the-meter solutions are key

To circumvent delays to grid upgrades, AI developers in the US, UK and Europe are actively looking for behind-the-meter solutions, which do not require access to the main electricity grid.[27]

Renewable private grids

To facilitate large-scale, on-site generable generation, developers can construct on-site, privately operated, distribution grids which may be connected to the main transmission grid. These involve a combination of renewables and backup gas and/or battery storage to offer resilient, always-on, low-carbon power.[28] Private grids can also be extended to nearby housing developments and industrial connections – supporting local communities to meet growing energy demand. Critically, they can offer power at less than half the cost of the main electricity grid.[29]

While private grids are promising, they do not offer a short-term solution as a primary power supply. On-site renewable generation has a significant real estate requirement, while consenting can take upwards of three years.[30] From here, construction can take a further three years – bringing deployment well into the 2030s. Additionally, interviewees confirmed that some operators may still require private grids to connect to the main network to ensure reliability, which would likely incur similar connection delays. In our research, both data centre operators and industry representatives confirmed that they were considering private grids as a longer-term solution.

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[7] DSIT, Compute Evidence Annex, p.14, July 2025

[8] DESNZ, Sizewell C, 22 July 2025

[9] The UK's Average Cold Spell (ACS) demand is a standard benchmark used in the energy industry to estimate how much energy demand would be expected during a typical cold winter. It is used for resilience testing and published in FES data.

[10] TechUK are working closely with NESO, Ofgem and government on a Gate 2 'readiness criteria' for demand connection reform. The recommendations being developed align with the content on this report regarding queue integrity, speculative applications, and the need for more realistic assumptions about data centre flexibility. They emphasise that Gate 2 criteria must reflect how data centres are actually developed.

TechUK, UK energy regulators advance grid connections reforms, 16 December 2025

[11] DSIT, Delivering AI Growth Zones, November 2025

[12] NESO, Neso implements electricity grid connection reforms to unlock investment in Great Britain, 8 December 2025

[13] Barbour ABI, Interactive Smart Map, 2 February 2024

[14] WEF, Data Centre resilient workforce, 24 September 2025

[15] DSIT, Delivering AI Growth Zones, November 2025

[16] NESO, Neso implements electricity grid connection reforms to unlock investment in Great Britain, 8 December 2025

[17] Ofgem launched a call for input into this issue on the 13th of February 2026. Ofgem, Demand Connection Reform, 16 February 2026

[18] NESO assumes 100GW by 2035 – an 83 GW increase. Given project need for connections ahead of this period, this does not offer a realistic trajectory. NESO, Connections Reform, Accessed March 2026

[19] In SSEP, only 1-2GW of Data Centre demand is being spatially mapped/co-optimised. However, different overall DC demand levels and sensitivities are being tested - these levels have been received in the demand data for SSEP from DESNZ.

[20] NESO, SSEP, p.24, May 2025

[21] The system impact will vary depending on several variables – including load factor, location, and interaction with peak demand. Here, we evaluate what would be required in a high-demand, high-load factor scenario with widespread electrification across industry and households.

[22] See FES 2025 Economics Tables and Graphs Data Workbook. Additional Capex in power system of £8.6bn in 'holistic transition' scenario, and further £4.84bn to reach 'electric engagement'.

[23] DESNZ, Domestic electricity prices in the EU for small, medium and large consumers (QEP 5.6.1, 5.6.2 and 5.6.3). See 5.6.2 'medium' for January-June 2025.

[24] DESNZ, Non-domestic electricity prices in the EU for small, medium, large and extra large consumers (QEP 5.4.1 to 5.4.4). See 5.4.4. 'very large' for January-June 2025.

[25] ONS, Impact of Higher Energy Costs on the UK, 19 May 2025

[26] NB: while the UK does not have zonal pricing, this could still occur at a macro level. Reuters, Trump article, 1 December 2025

[27] S&P Global, Data Centre developers turn to distributed behind-the-meter power, 23 October 2025

[28] CNZ, How to accelerate the UK's AI revolution, Accessed March 2026

[29] The Zero estimates £70 million annual operating cost for100MW Wind + Solar + BESS powered data centre, vs. SHGH analysis which finds £186 million cost for a grid-powered data centre of same size (see Annex for assumptions).

[30] CNZ, How to accelerate the UK's AI revolution, Accessed March 2026

Small modular reactors

"SMRs do not unlock capacity for this wave of data centre deployment" – UK SMR developer

Small Modular Reactors (SMRs) are smaller than traditional nuclear reactors and can offer consistent power with a relatively small real-estate footprint and construction timeline (compared to large-scale nuclear). While this is ideal for data centres, they face significant regulatory and cost hurdles. While current policy aims for SMRs to deliver electricity at a levelized cost of £70/MWh, results from other markets suggest that the cost today is in the hundreds of pounds.[31,32] Critically, this cost will not come down until SMRs are deployed at scale in the UK, which will not happen well into the 2030s. Interviewees confirmed that even with SMRs, data centres would still require grid connections and/or onsite backup (BESS, gas, or diesel) to support resilience and facilitate refuelling of SMRs.

Gas turbines and engines

"Gas turbines can act as a bridge for the next five to ten years while an SMR fleet is built." – UK SMR developer

Unlike renewable private grids and SMRs, gas-fired electricity generation can be installed on-site and deliver relatively cost-effective electricity in the near-term.[33] Typically, this involves an on-site gas turbine or engine. While they produce electricity at a slightly higher cost, gas engines are more readily deployable than turbines and offer more flexibility. This is key, as they can operate as a primary energy source today, while retaining their role as backup power from the mid-2030s onwards, as renewable private grids and SMRs become viable. From here, additional gas engine capacity can also be sold back to the capacity market – offering long-term security for the asset.

Behind-the-meter solutions are key to unlocking AI-growth. What is less clear, however, is what impact this demand for gas, renewables, or SMRs will have on the energy system.

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[31] GOV.UK, SMR Challenge, 12 June 2023

[32] Wood Mackenzie, Nuclear's Net Zero Growth Opportunity, 14 March 2024

[33] See Table 1 below for analysis

Actions for policymakers

Align energy system planning with AI growth scenarios

At present, Government's plans for growing UK compute capacity are not fully reflected in energy system planning. This has created a mismatch between the UK's AI ambitions and the assumptions used in the Holistic Transition pathway, which allows for 22.8TWh of electricity demand by 2030. Because these assumptions flow directly into spatial planning, underestimating demand also risks underestimating where and when the electricity grid will be constrained. In practical terms, this could slow the rollout of data centres, limit the UK's ability to scale AI, and delay other developments that rely on the same grid capacity, including new housing.

The following actions would close this gap and improve delivery:

Recommendation 01
NESO should work with the AI Energy Council to include a clear "AI growth" scenario in the 2028 Future Energy Scenarios (FES 28). This would ensure that electricity generation, networks and flexibility are planned based on the Government's actual compute ambitions, reducing the risk that AI projects are delayed due to a lack of available power. This work should also assess the role of behind-the-meter solutions, such as on-site generation and storage, which can help bring capacity online more quickly and at lower cost.

Recommendation 02
Rather than assuming data centre demand can simply be moved to the "best" locations on the grid, NESO and the AI Energy Council should jointly develop a method to assess how flexible different types of data centre demand really are. This would give planners a clearer picture of which loads can be relocated and which must be close to users, improving decisions about where capacity is genuinely available. Initially, this should be informed by forecasts of future training versus inference demand developed for the UK Compute Strategy. Over time, this analysis should become more detailed, reflecting the different needs of emerging AI applications.

Recommendation 03
NESO and the and Regional Strategic Energy Plan (RESP) Strategic Boards should embed these assumptions consistently across the Strategic Spatial Energy Plan (SSEP), the Centralised Strategic Network Plan (CSNP), and Regional Strategic Energy Plans (RESPs). Doing so would improve coordination between national and regional planning, allow network investment to happen earlier and more efficiently, and reduce the risk of grid constraints delaying AI infrastructure and other priority developments.

03

The gas network is already unlocking AI growth

Data centre developers are increasingly exploring alternatives that can deliver high-capacity power within commercially viable timeframes.[34]

"…an electricity connection is completely incompatible with our business case, and therefore we need… a different strategy…" – Data centre developer

Faced with long electricity connection timelines, high and volatile power costs, and limited ability to relocate or flex demand, developers are reassessing electricity-only strategies for new AI infrastructure.

This uncertainty undermines project bankability, pushing developers to explore alternative power pathways that can deliver high-capacity, continuous supply within predictable costs and timelines. Interviewees overwhelmingly agreed that without a secure three-to-five-year solution to connection, many projects would be rendered uninvestable and risk collapse.

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[34] Natural Gas Intelligence, Gas isn't just a transition, 9 October 2025

What the gas network offers today

> "…from our perspective, [any electricity grid connection] beyond 2027, it's just not something [we're] very interested [in] at the moment… we need it now, not in 2029 or wherever." – AI operator

In many cases, developers are considering the gas network as the only viable solution to power supply within commercially viable timelines. While securing a primary connection to the electricity grid can entail a lead time of over a decade, a gas-powered solution, specifically an on-site gas engine, can often be fully operational within just 12-18 months. Similarly, the gas network may not require lengthy upgrades in key locations. For developers with near-term investment horizons, this can mean the difference between bankability and infeasibility, while the electricity system awaits upgrading.

Supply is available where it is needed

The gas distribution network offers data centre deployment in the near-term. Unlike the electricity grid, which is highly constrained in specific locations, the gas distribution network runs through most towns, cities, business parks, and industrial estates across the country. This gives developers far more choice over where to locate new data centres and allows projects to move ahead without waiting for major new infrastructure to be built.

Importantly, this network is not theoretical or experimental. Using existing gas connections to supply on-site power generation is a well-established approach. From a delivery perspective, this removes a major bottleneck that currently affects electricity-only projects.

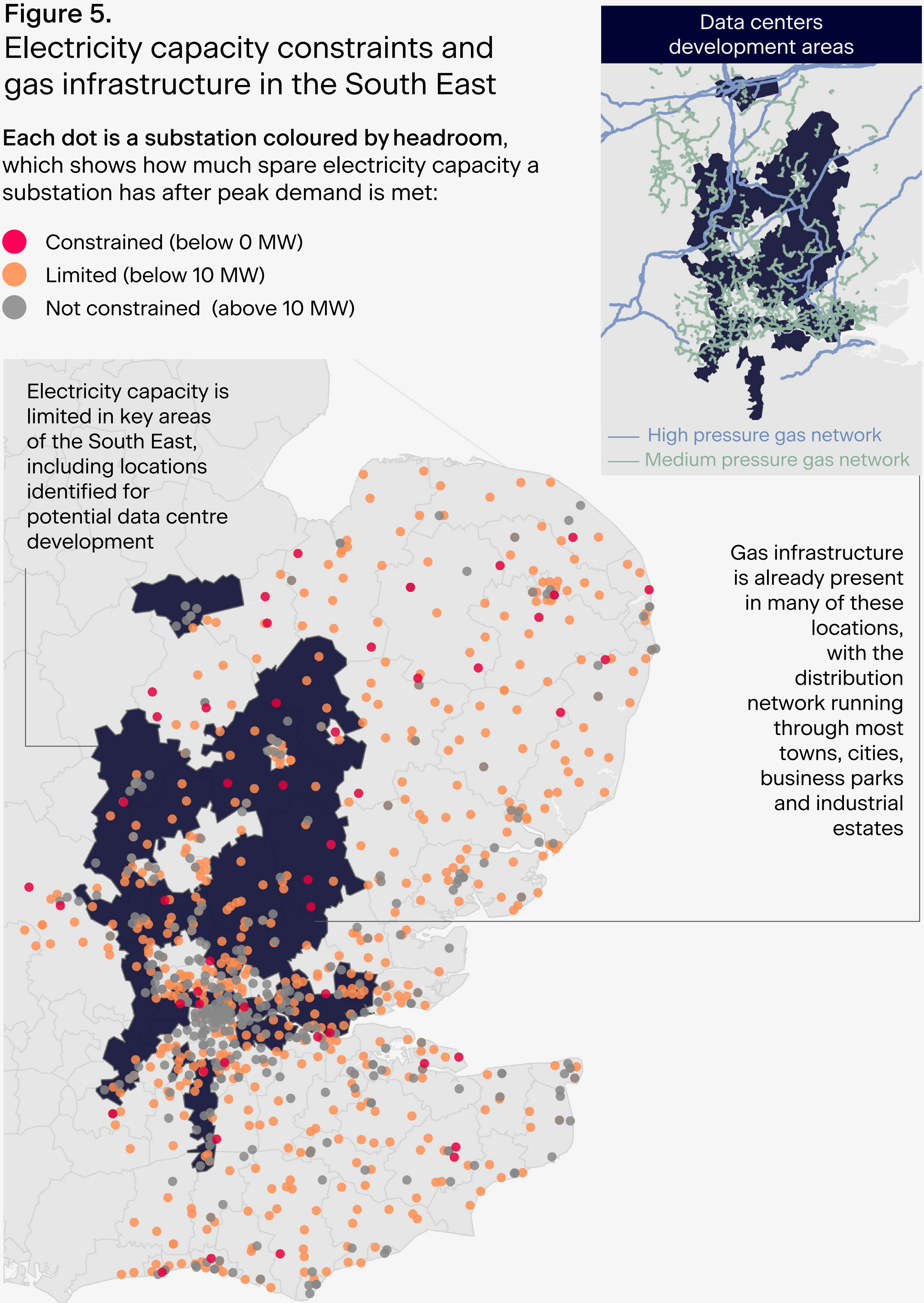
In London and the Southeast, where demand for AI computing is highest, and electricity capacity is most limited, access to nearby gas infrastructure can be decisive. Projects such as the proposed NScale campus in Loughton, which sits near one of the UK's major electricity constraints, but alongside a readily available gas network, illustrate this.

Figure 5 shows the areas around London and the South East that have substantial data centre development pipelines – the shaded area alone currently has 5.6 GW of planned data centre capacity (this is only data centres with planned connections). Meanwhile, many of the electricity substations in the region have no or very little headroom and are likely to become more constrained as more developments and consumers connect to the grid. The high-pressure gas network, fed from the Bacton terminal, runs right through the heart of these development areas with constrained grid access, and may provide more accessible power connections, potentially solving the grid connection problems many developers are facing.

Figure 5.
Electricity capacity constraints and gas infrastructure in the South East

Each dot is a substation coloured by headroom, which shows how much spare electricity capacity a substation has after peak demand is met:

- ● Constrained (below 0 MW)
- ● Limited (below 10 MW)
- ● Not constrained (above 10 MW)



Electricity capacity is limited in key areas of the South East, including locations identified for potential data centre development

Gas infrastructure is already present in many of these locations, with the distribution network running through most towns, cities, business parks and industrial estates

Source: SHGH analysis using UK Power Networks data

Gas connections are commercially viable

Gas connections offer a commercially viable solution to data centre developers, providing the required very secure connection with almost unlimited, scalable power supply. Below, we modelled the financial and operational outlook for a 'typical' 100 MW hyperscale data centre, using a gas engine as its primary power source. Interviewees outlined that this was the most likely model, as the engine can operate both constantly and intermittently – allowing its use for baseload in the near- to medium- term, and as backup when electricity connections become more viable, from 2035 onwards.

The model demonstrates that fossil gas can also be the more cost-efficient method, with a unit cost of 4.53p per kWh compared to 22.15p for grid electricity. Even after accounting for the capital expenditure required for on-site gas engines and ETS costs, the total power costs of £103.60m remain lower than the electricity equivalent of £155.20m - a 33% overall cost reduction, reinforcing the conclusion that gas infrastructure currently offers one of the few commercially viable options for delivering power within required timeframes. This data is summarised in Table 1.

	Electricity grid	**Gas grid with onsite generation**
Time until operation	Up to 10-15 years	Within 12-18 months
Cost per kWh	22.15p	4.53p
Total power costs (incl. Capex of on-site gas engine)	£155.20m	£103.60m
% power cost change compared to electricity grid as primary source	-	-33%

Our analysis indicates that moving from the electricity network as the primary source of power to gas will be cost-competitive for DC developers, even factoring in ETS costs and Capex. The significance of this comparison lies less in marginal cost savings and more in the ability to deploy capacity at predictable cost within commercially viable timelines.

The shift to gas is underway

Data centre developers have already recognised this potential. Data collected from the country's five gas distribution networks confirms this, with 86 formal enquiries submitted by data centre developers between August 2024 and July 2025. This surge in engagement confirms that developers are actively pursuing it as a primary power strategy to manage constraints in the electricity grid.

Interest also appears to be accelerating. In the most recent quarter alone (May to July 2025), networks received a further 17 enquiries, and in the last year, six firm connection agreements have been finalised.

Actions for policymakers

Recognise the strategic value of the gas network in AI growth

Without policy change, Government risks operating on inaccurate assumptions, and constraining gas networks' capacity to quickly and safely accommodate this demand.

The following recommendations are designed to safeguard the UK's electricity network capacity, and retain the UK's AI growth potential:

Recommendation 04
DESNZ should update its Strategic Policy Statement to reflect the strategic importance of the gas grid as critical to supplying cost-effective available energy for industry. Ofgem should reflect this steer in subsequent decisions on the economic regulation of the gas networks.

Recommendation 05
The Industry-Government council (AI Energy Council) considering AI energy demand should ensure its advice and analysis accurately reflects growing AI demand for gas networks. Currently, the Council has no representation from gas networks. The sector should be represented at the Council, and the strategic role – and policy actions needed to enable growth of – green gas should be discussed.

Recommendation 06
To support the rapid rollout of AI data centres without pushing unnecessary costs onto consumers, Ofgem should introduce a targeted "use-it-or-lose-it" funding mechanism for gas networks under RIIO-3. This would allow gas networks to carry out essential, time-critical preparatory works only where data centre demand is real and committed, with funding automatically returned if projects do not proceed.

04

Harnessing AI demand for green gas

The gas network is the only near-term route to AI growth – and green gas is the catalyst.

In our research, interviewees acknowledged gas connections as often offering the only viable medium-term route to the UK's AI growth ambitions. This reflects a global trend – with natural gas underpinning a major share of AI growth well into the 2030's, especially in the USA.

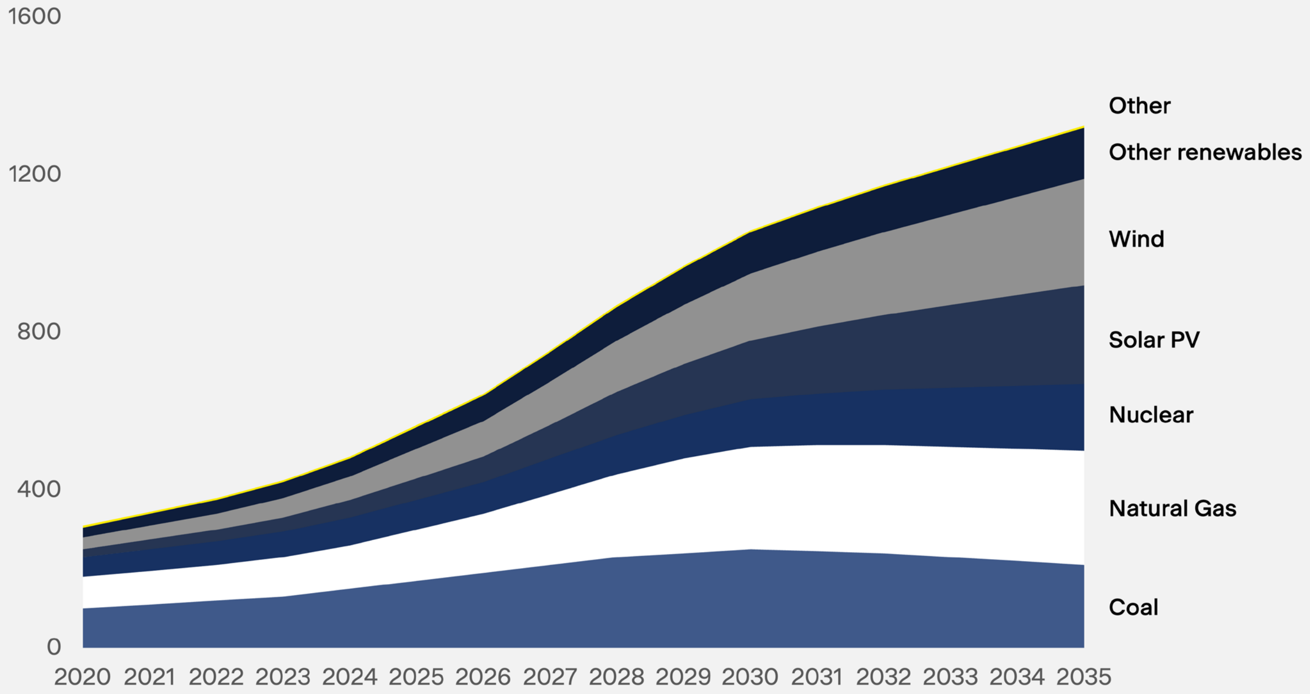
Despite this potential, interviewees did acknowledge that this presents a significant dilemma when the gas grid is primarily fossil-supplied. Multiple respondents commented on the investor and reputational risks of failing to curb emissions in line with carbon accounting, which would not be possible with unabated fossil gas use.

Gas demand is inevitable – but comes with risk

"Gas is the...the only resort" – data centre operator.

Across the world, gas underpins AI growth. Today, natural gas powers over a quarter of global data centre energy demand – reaching 40% in the USA. This figure is expected to remain relatively steady well into the 2030's, as "long grid connection queues" prohibit exponential renewables growth within the period.[35]

Figure 6.
Global electricity generation for data centers



Source: IEA

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While gas may be the most commercially viable option in many cases, use of fossil gas can introduce additional project risks, particularly ESG and reputational considerations, that developers and investors may need to manage. Below, we explore this risk and how it can be addressed with biomethane.

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[35] IEA, Energy supply for AI, Accessed March 2026

[36] IEA, Sources of global electricity generation for data centres, 4 April 2025

Fossil gas risks investor certainty

"There is a very real tension between the commercial necessity of gas connections and the reputational and emissions risks of increasing gas use." – Industry representative

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.[37] This creates both commercial, investment, and project risks.

Under the current carbon price, the above data centre would incur an annual ETS charge of over £5 million per year, rising to over £13 million in 2035.[38]

Beyond compulsory carbon pricing, hyperscalers, including Microsoft and Google, report annually on their emissions reduction target.[39,40] An increase in gas-powered data centres risks missing these targets, and their ability to on-sell their services to firms that also maintain decarbonisation targets. This is a significant investment risk, especially as scope 3 emissions are increasingly incorporated into carbon accounting.

Reliance on fossil fuels can also compromise developers' ability to deploy new data centres. At a local level, negative perception of data centres as highly-emitting may prompt residents and local politicians to challenge the planning and consenting of new data centres. In England, any new combustion energy generation must demonstrate 'decarbonisation readiness' (a route to carbon capture or hydrogen usage) by March 2026. Without this, the Environment Agency will not consent to any on-site gas-powered generation.

For the above reasons, data centres are actively looking into hydrogen, but did acknowledge that it does not unlock the rapid low-carbon energy that they need today.

Biomethane closes the emissions gap

To maximise AI growth, the UK needs to offer data centres low-carbon power connections at pace. Biomethane can offer this.

Biomethane is the only available green gas available today. Generally produced from wastes and off-season rotational crops, biomethane can be injected into the gas grid and replace fossil gas.

When substituted for fossil gas, biomethane can deliver substantial emissions reductions—up to 70% on a lifecycle basis, rising to over 100% (negative emissions) where carbon capture and storage is applied to the production process.[41,42] Critically, new biomethane plants can be deployed relatively quickly (contingent on consent), with construction times as low as six months.[43]

In 2024, over 7 TWh of biomethane were injected into the UK's gas grid, equivalent to over 600,000 UK homes' annual gas consumption.[44,45] This figure can grow exponentially. In its latest Future Energy Scenario, NESO incorporated biomethane directly into its Holistic Transition pathway. NESO estimates that approximately 35 TWh, or about three million homes' current annual gas consumption, could be supplied by biomethane in 2035. In markets with stronger biogas ambition, like Denmark, biomethane is expected to replace almost 100% of fossil gas in the grid by 2030.[46]

A low-cost solution

Biomethane is already competitive with electricity for industrial users – and policy could make it cheaper than fossil gas or data centres facing high electricity prices and long connection delays. This matters more than marginal differences in fuel costs: what determines investment decisions is whether power can be secured at a predictable, bankable price within commercially viable timeframes.

Table 2: Operational cost for 100MW Data Centre with different energy sources

	Electricity grid	Fossil gas	Biomethane	
			Status quo	Added to ETS
Time until operation	Up to 10-15 years	Within 12-18 months		
Cost per kWh	22.15p	4.53p	9.01p	7.01p
Total power costs per year (incl. Capex of on-site gas engine)	£155.20m	£103.60m	£173.36m	£116.68m
% power cost change compared to electricity grid	-	-33%	12%	-25%

- Today, biomethane can be produced at an average levelized cost of around 9p/kWh. While this is higher than the cost of industrial fossil gas (around 4.5p/kWh), it could be significantly cheaper than operating solely on electricity from the grid (see table 2).[48] For data centres, which are highly exposed to energy costs due to always-on demand, this positions biomethane as a credible near-term alternative.

Crucially, there are three levers through which to bring down this cost:

- First, scale and production support. The Government's Green Gas Support Scheme currently provides between 3.98–6.86p/kWh for biomethane injections, helping bring production costs down to levels comparable with fossil gas. While this scheme cannot currently operate alongside commercial offtake agreements, it demonstrates that biomethane can reach cost parity during scale-up.

- Second, fair carbon accounting. Under current rules, companies cannot reduce their exposure to the UK Emissions Trading Scheme by supporting biomethane injection into the gas grid, despite the lifecycle emissions savings this delivers. In European markets where green gas injections are recognised within carbon pricing frameworks, industrial users can materially reduce their effective operating costs. Under current ETS prices, equivalent recognition in the UK would significantly narrow, the cost gap between biomethane and fossil gas, while also improving competitiveness relative to grid electricity.

- Third, supply-chain flexibility and demand certainty. Analysis undertaken for Cadent shows that allowing a broader range of sustainable feedstocks, improving demand certainty through long-term offtake agreements, and making targeted changes to technical regulations could reduce biomethane production costs by around 2p/kWh.[49] Combined with carbon pricing reform, this would make biomethane a decisively lower-cost option than grid electricity for many data centres.

For data centre developers, these are crucial. Biomethane offers a route to secure low-carbon power at predictable cost over a 10–15-year asset lifetime, aligning with both commercial financing requirements and ESG reporting obligations. This is particularly important for facilities that expect to transition to grid connections or other technologies later in the 2030s but require an investable solution today.

The conclusion is clear: the economics of biomethane need not be the binding constraint. Effective policy design can unlock green gas when and where it is needed. The following section, therefore, examines why this cost-effective pathway has not yet scaled—and what must change to unlock it.

Case study

AstraZeneca decarbonising pharmaceuticals with Future Biogas

In 2023, AstraZeneca (AZ) signed a long-term biomethane offtake agreement with Future Biogas Limited, for 100 GWh of low carbon gas per year.[50] AZ uses a Combined Heat and Power Plant, connected to the gas transmission network, to power its sites in Macclesfield, Luton, and Speke. It simultaneously supports biomethane production, which it uses to offset its on-site gas combustion – without need for Government subsidy.[51] This allows AZ to help decarbonise the gas grid, without needing to transport gas feedstocks long distances or find the real estate on site.

A system benefit

A green-gas pathway for data centres does not just offer a low-carbon lifeline to the UK's AI ambitions, but creates longer-term stability within the energy system, scales a critical future resource, and unlocks agricultural co-benefits.

System flexibility

Even as the UK accelerates renewables through the 2030s, the system is expected to retain a continuing need for dispatchable "top-up" generation to cover periods of low renewable output and peak demand.[52] With much of the UK's CCGT capacity set to reach the end of its lifetime by 2035, data centres – transitioning to grid connections, microgrids, and SMRs from this point – can sell their gas-fired generation capacity back to the system.[53] This offers a route to ensuring the UK's system flexibility, while allowing the private sector to absorb a significant portion of the Capex cost, and ensuring low-carbon gasses replace fossil use in these turbines.

Low-cost, secure decarbonisation

Today, biomethane is one of the few low-carbon fuels that is UK-made, grid-compatible and storable. It can diversify supply away from imported fossil gas and provide a firm, dispatchable back-up energy source – at pace. More significantly, biomethane is one of the cheapest routes to decarbonisation, with carbon abatement costs less than half of SAF and a quarter of direct air capture.[54]

Over time, biomethane can move from replacing gas in industry, homes, and heavy goods, to protecting system stability and decarbonising the hardest-to-abate sectors. From heavy industry to aviation, to shipping, biomethane can be deployed across the UK economy, offering a 'zero regrets', flexible resource for which there will be strong demand well beyond 2035.[55,56] As greenhouse gas removals become available, biomethane can offer the triple benefit of waste management, energy production, and net carbon removals – improving its relative carbon abatement cost even further.

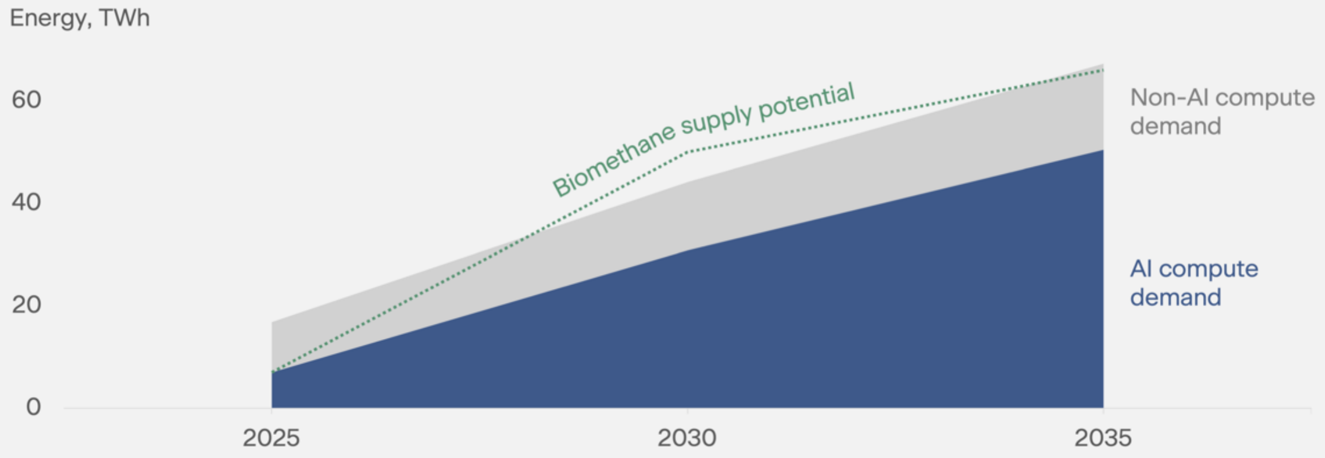
Agricultural co-benefits

Beyond emissions, biomethane offers additional revenue to farmers, helping to extract additional value. Biomethane production produces digestate that can be used as a nutrient-rich fertiliser, potentially reducing reliance on imported mineral fertilisers. Additionally, feedstock supply contracts offer diversified revenue streams—allowing farmers to benefit from improved land management by selling rotational crops, which improve soil health, and agricultural waste.

The biomethane policy gap

The UK's ability to decarbonise gas-powered AI infrastructure is constrained not by feedstock availability or cost, but by policy design. Analysis by the Green Gas Taskforce shows that the UK has sufficient sustainable feedstocks to support around 50 TWh of biomethane production by 2030, without compromising food production or other energy uses.[57] This would be more than enough to decarbonise the UK's entire projected data centre demand (see Figure 7).[58] Yet current policy does not reflect—or enable—this level of ambition.

Figure 7.
Data centre moderate energy demand vs. biomethane supply potential



Source: SHGH analysis

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37 See modelling annex

38 See modelling annex; assuming £109/tonne CO2 price, as per – DESNZ, Traded carbon values used for modelling purposes, 17 December 2024

39 Microsoft, SBTi blog, 14 March 2024

40 Google, 2025 Environmental Support, Accessed March 2026

41 GGT, Benefits of Biomethane, Accessed March 2026

42 GGT, E.A.C Submission, Accessed March 2026

43 Weltec, Massive UK biomethane plant went live after only six months construction, 28 October 2019

44 679 ktoe, equivalent to 7.89 TWh. DESNZ, DUKES 6.4, 31 July 2025

45 Annual average household energy consumption: 11,500 kWh gas, 2,700 kWh electricity. Ofgem, Average gas and electricity use explained, Accessed March 2026

46 Energistyrelsen, Biogas in Denmark, Accessed March 2026

47 See source for comprehensive analysis of policy changes. Cadent, Accelerating biomethane in the UK, November 2025

48 See Annex for cost assumptions

49 GGT and Cadent, Green Gas Britain, 9 October 2025

50 Future Biogas, AstraZeneca partnership announcement, 14 September 2023

51 Future Biogas, Pioneering the UK's first unsubsidised biomethane plant, Accessed March 2026

52 GOV.UK, Clean Flexibility Roadmap, July 2025

53 ICIS, Dash for gas, 27 November 2017

54 GGT and Cadent, Green Gas Britain, 9 October 2025

55 Velocys, Pioneering the first electrified biogas-to-SAF plant, Accessed March 2026

56 BCG, Biogas can help global shipping go green, 19 January 2024

57 GGT, Unlocking the future of biomethane, Accessed March 2026

58 See Annex for data

Scenarios out of step

Despite this potential, existing energy system planning assumes far lower biomethane deployment.[59] NESO's current scenarios are not necessarily designed with data centre gas demand in mind. They assume a 33% reduction in total UK gas demand by 2035.[60] This includes a biomethane supply of around 35 TWh - roughly 70% of what could realistically be delivered. Taken together, this suggests that energy system planning may not align with future demand for both the gas network and biomethane. These assumptions do not merely describe the future; they actively shape it. By feeding into decisions on feedstock allocation, carbon pricing, and infrastructure planning, they shape the market for biomethane.

The result is a circular policy problem: biomethane is not scaled because it is not assumed, and it is not assumed because it has not yet scaled.

Policy constricts growth

This disconnect is reinforced by a series of policy and regulatory choices that collectively suppress biomethane development:

- The Biomass Strategy (2023) anticipates just 8 TWh of biomethane injections by 2030, signalling limited ambition despite significantly higher sustainable potential.[61]
- Support schemes restrict eligible feedstocks, limiting the use of rotational and seasonal crops that can be grown between harvests, improving soil health, and increasing biodiversity.[62]
- Biomethane injections are excluded from the UK Emissions Trading Scheme, preventing industrial users from being rewarded for supporting low-carbon gas—despite equivalent recognition in the EU ETS.
- Large-scale biomethane projects are excluded from Nationally Significant Infrastructure status, unlike similarly sized wind or solar operations, prolonging planning timelines and increasing delivery risk.[63]

> While AI developers see the gas network as critical, they are concerned that – under its current composition – the carbon impact of gas-fired generation will pose a major investment risk.

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[59] NESO's most ambitious Biomethane pathway, Holistic Transition, has Biomethane supply at 26.4 TWh in 2030. NESO, FES Workbook, Accessed March 2026

[60] There is significant variability in NESO's scenarios. The scenario with the lowest gas usage is Holistic Transition, with 906 TWh from gas in 2035, and the scenario with the highest gas usage is Falling Behind, with 1,300 TWh from gas in 2035. NESO, FES Workbook, Accessed March 2026

[61] DESNZ, Biomass Strategy, 2023

[62] GGT, A green gas future, 25 September 2025

[63] ADBA, Written evidence, Accessed March 2026

Actions for policymakers

Enable green gas to decarbonise the UK's gas network

Biomethane can decarbonise the gas network cost-effectively, unlocking additional low-carbon capacity within a relatively short timeframe. To scale biomethane across the UK, and leverage data centre demand to do so, Government can take the following actions:

Recommendation 06
DESNZ should ensure data centre gas demand is met with an increasing share of biomethane within the network, guaranteeing compatibility with Government's Clean Power 2030 and Carbon Budget commitments. This should involve a ratcheting policy mechanism, which can support growth and reward proactivity, while maintaining the obligation of regulatory backstop, if this becomes necessary. This can involve two stages, involving:

Stage 1
Public dashboard. In the first instance, DESNZ should work with Ofgem, data centre operators, and networks, to develop a monitoring mechanism and publicly available carbon intensity dashboard. This should incorporate data from offtake agreements, carbon accounting dashboards, and energy networks, providing clear data to decisionmakers and investors.

Stage 2
Evaluation and potential obligation. DESNZ should periodically review the compatibility of data in Stage 1 with its Clean Power and Carbon Budget obligations. If data centre demand for biogas does not scale at the pace needed, Government should consider a green gas obligation directly onto data centres operating gas-powered generation. The timeline and scale of this obligation should be consulted on with industry, to ensure that growth and decarbonisation ambitions are both accounted for.

Recommendation 07
Alongside target-setting, DESNZ should actively reward green gas investment by data centres, using the following policy levers:

The UK ETS does not currently reward for emissions reductions incurred by injecting biomethane into the grid – setting the UK out of step with its EU competitors and reducing the incentive for industry to invest in biomethane. DESNZ can rectify this by extending the UK ETS, and working with carbon accounting frameworks, to support recognition of biomethane injections into the gas grid.

DESNZ can also work with DEFRA to fast-track biomethane permitting. While data centres, and much of the UK's energy infrastructure, benefit from automatic fast-tracking through the planning and consenting process – biomethane plants do not. Similarly, data centres with biomethane offtake agreements do not meet the Environmental Agency's criteria for 'decarbonisation readiness', which is necessary to gain approval for new on-site gas generation. Government can solve this by automatically designating green gas production as nationally significant, while the Environmental Agency can embed biomethane into their decarbonisation readiness framework.

Recommendation 08

DESNZ should also work with DEFRA to unblock access to green gas feedstocks, ensuring that the UK can most effectively use its resources to decarbonise the network.

Government is currently considering a cap on UK crop use for energy, including biomethane.[64] This ignores whether these are rotational crops (which do not displace food). Instead of pursuing this, Government should set minimum emissions, land use, and sustainability thresholds across all schemes, to allow the maximum value from the UK's energy feedstocks.

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[64] GOV.UK, Biomass sustainability framework, 2 December 2025

05

Conclusion

The UK's AI ambitions are achievable only if they are physically deliverable. The compute strategy is now inseparable from energy strategy. Without timely access to large volumes of reliable power, the UK will struggle to secure the investment and productivity gains that AI promises.

The evidence in this paper shows that an electricity-only pathway cannot meet the scale and speed required in the near term. Grid connection timelines create a structural bottleneck that risks slowing AI deployment and undermining the Government's compute ambitions. Connections reform and long-term infrastructure planning are necessary, but they are not sufficient to unlock capacity within commercially viable investment windows.

The market has already responded. Developers are turning to the gas network because it offers what the electricity system currently cannot. It is already embedded across the UK's industrial and urban geography and is now functioning as enabling infrastructure for AI growth.

Fossil gas alone cannot provide a durable solution, however. Unabated use would expose developers to rising carbon costs and reduced investor confidence. The long-term credibility of gas-powered AI infrastructure, therefore, depends on decarbonisation.

Biomethane provides the missing link. It is deployable today and compatible with existing infrastructure. The UK also possesses sufficient sustainable feedstocks to scale supply well beyond projected data centre demand. With targeted reforms, biomethane can transform gas from a bridge solution into a strategic growth asset.

If the Government acts decisively, AI demand can become a catalyst: accelerating biomethane production, supporting system flexibility, lowering the carbon intensity of the wider gas grid, and anchoring domestic investment. If it does not, the UK risks constraining one of its most significant economic opportunities based on infrastructure assumptions that no longer reflect market reality.

The UK already possesses one of the critical assets required to compete in the AI space. The task now is to use it strategically.

06

Annex 1
Tables and Figures

Table 1: Operational cost of electricity vs. gas grid for 100MW data centre

	Electricity grid	**Gas grid with onsite generation**
Time until operation	Up to 10-15 years	Within 12-18 months
Cost per kWh	22.15p	4.53p
Total power costs (incl. Capex of on-site gas engine)	£155.20m	£103.60m
% power cost change compared to electricity grid as primary source	-	-33%

Table 2: Operational cost for 100MW Data Centre with different energy sources

	Electricity grid	**Fossil gas**	**Biomethane**	
			Status quo	Added to ETS
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Cost per kWh	22.15p	4.53p	9.01p	7.01p
Total power costs per year (incl. Capex of on-site gas engine)	£155.20m	£103.60m	£173.36m	£116.68m
% power cost change compared to electricity grid	-	-33%	12%	-25%

Tables 1 and 2 are constructed from the same analysis that primarily aims to quantify the impact of changing primary power sources and policy changes on the cost of powering data centres. The analysis uses several assumptions, detailed in Table 3 below.

Variable	Value	Assumption	Source
Data Centre Load Factor	80%	Data Centres use energy equivalent to 80% of their maximum capacity	https://www.icis.com/explore/resources/data-centres-hungry-for-power
Reciprocating Gas Engine Efficiency	45%	An average reciprocating gas engine will convert fuel to energy with an efficiency of roughly 45%.	https://www.powermag.com/benefits-of-reciprocating-engines-in-power-generation/
Capital Cost of Gas Engine	£0.75m per MW	Capex of building a reciprocating gas engine collocated with a data centre is £0.75m per MW of capacity.	https://www.gov.uk/government/publications/electricity-generation-costs-2023
Lifetime of Gas Engine	10 years	A large gas engine collocated with a data centre will last 10 years (roughly 80,000 hours) before it needs major refurbishment or replacing.	https://www.jenbacher.com/en/services/reman/reupengines/
Natural gas emissions factor	0.2 kgCO2/kWh	Burning both fossil gas and biomethane releases this amount of CO2 as they are currently seen as the same by the ETS.	https://www.gov.uk/government/collections/government-conversion-factors-for-company-reporting
Cost of ETS certificate over next 10 years	£80	Over the next 10 years, an ETS certificate will have an average cost of £80.	https://www.gov.uk/government/publications/traded-carbon-values-used-for-modelling-purposes-2024/traded-carbon-values-used-for-modelling-purposes-2024

Figure 3: NESO FES Holistic Transition vs. UK Compute Roadmap data centre demand projections

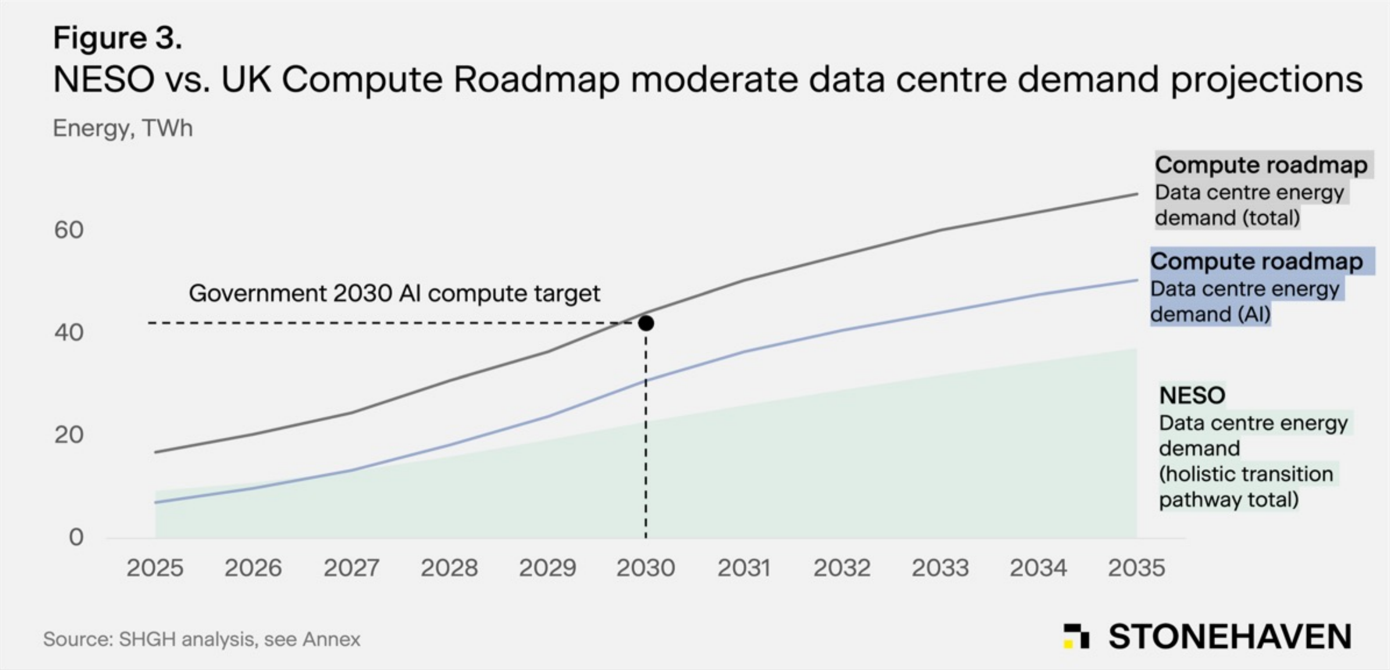

Figure 3 uses NESO FES numbers for data centre demand under the holistic transition pathway and compares them to the demand projections released by DSIT in the Compute Roadmap.[65,66] Compute Roadmap figures were given in GW and converted to TWh assuming a load factor of 80%. The graph clearly shows both AI data centre demand and total data centre demand quickly exceeding NESO's projections.

Figure 7: Data centre energy demand vs. biomethane supply potential.

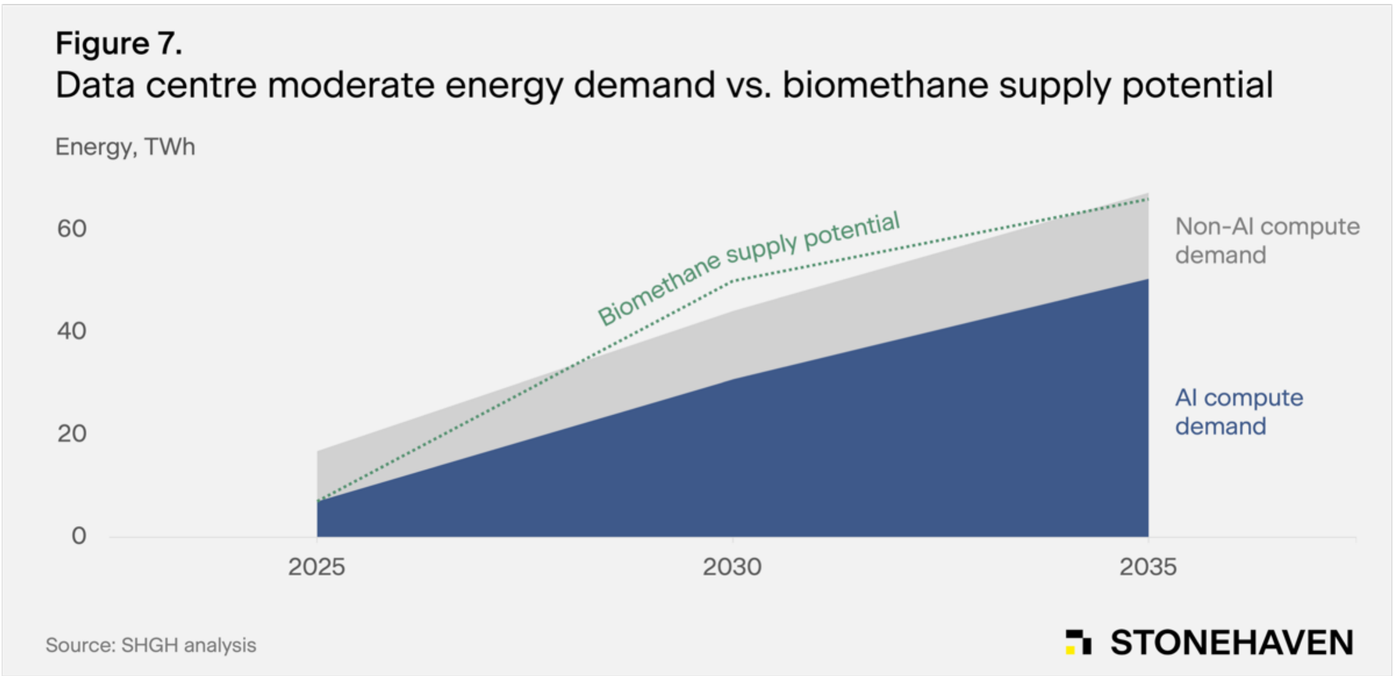

Figure 7 compares potential biomethane supply from the Green Gas Taskforce to data centre energy demand projections released by DSIT in the Compute Roadmap.

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[65] NESO, FES Workbook, Accessed March 2026

[66] DSIT, Compute Evidence Annex, July 2025

[67] GGT and Cadent, Green Gas Britain, 9 October 2025

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