



How datacentres are reshaping power systems - and what it means for investors

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Key takeaways

- Surging datacentre and AI power demand is reshaping electricity markets in North America and Europe.
- Ageing grids and rapid renewables deployment are driving a structural capex cycle across the power system.
- Long-dated, premium-priced power contracts are de-risking utility business models and supporting potential re-ratings.
- We see compelling opportunities across carbon free/low-carbon baseload generators and grid network companies.

Datacentres are the fastest growing component of electricity demand across North America and Europe. Power demand from AI/Datacentres makes up approximately 4.5% and 3% of total power demand across the US and Europe, respectively, and is forecast to reach at least 9% and 7% by 2030.¹ This implies that datacentre capacity in Europe will nearly triple to reach 31GW by 2030, whereas US datacentre capacity is likely to grow by a factor of four over the same period.²

We see AI/datacentre power demand growth boosting infrastructure spending requirements and creating specific, long-term investment opportunities across the electricity system. This relates to the increased need to develop carbon free/low carbon power, accelerate grid investments, and boost flexible generation capacity, amongst others, which we explore in more detail below.

Ageing infrastructure is driving an urgent need for investment across Europe and the US

Europe and North America have on average the oldest critical power infrastructure assets globally, as reflected in Chart 1. The majority of critical infrastructure, such as power networks, railways and bridges in these regions, was developed in the 1950s-1970s. In Europe, this corresponds to the post-World War II reconstruction era, where infrastructure capital expenditure (capex) accounted for an elevated proportion of GDP. However, according to the OECD, public investment which includes infrastructure capital expenditure only accounts for around 3.5% of GDP on average today.³

Taking the UK as a case study, the energy regulator (OFGEM) recommends a 40–60-year useful life for transmission towers and a 40-50-year useful life for substation plants, overhead lines and cables⁴. This implies that the majority of power infrastructure assets are approaching the end of their useful lives and will likely require further investment for replacement, maintenance or lifetime extensions where possible.

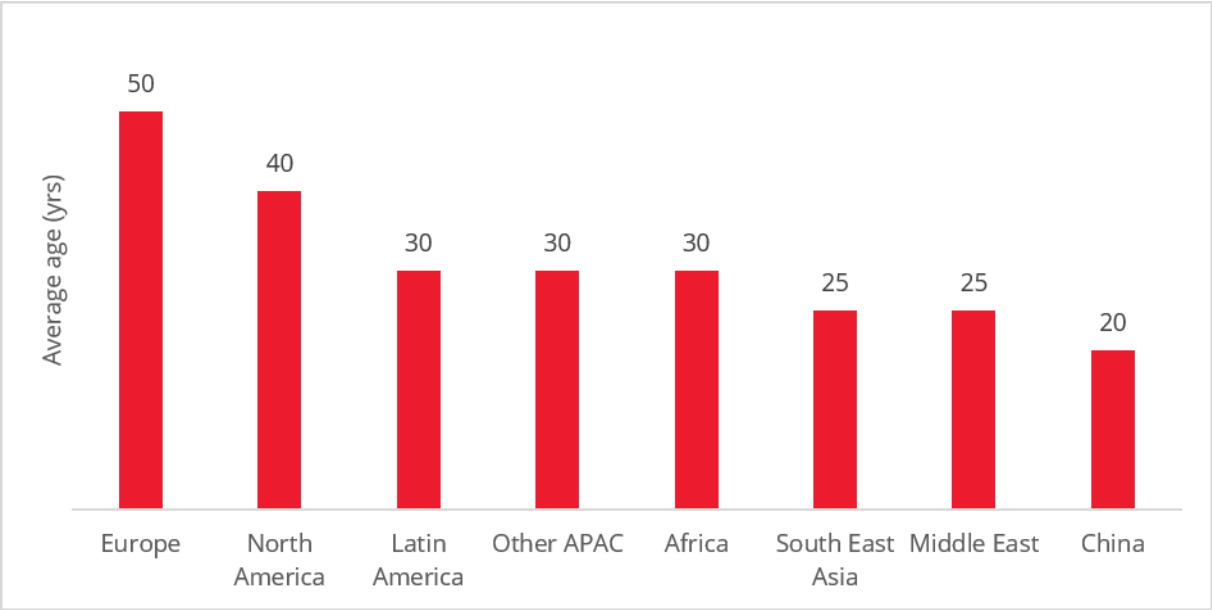
¹ UBS, January 2026; [EPRI, January 2026](#)

² UBS, January 2026

³ [OECD, May 2026](#)

⁴ [Ofgem.gov.uk](#)

Chart 1: Europe and North America have the oldest critical power infrastructure assets globally on average



Source: Goldman Sachs, September 2025. The information shown above is for illustrative purposes.

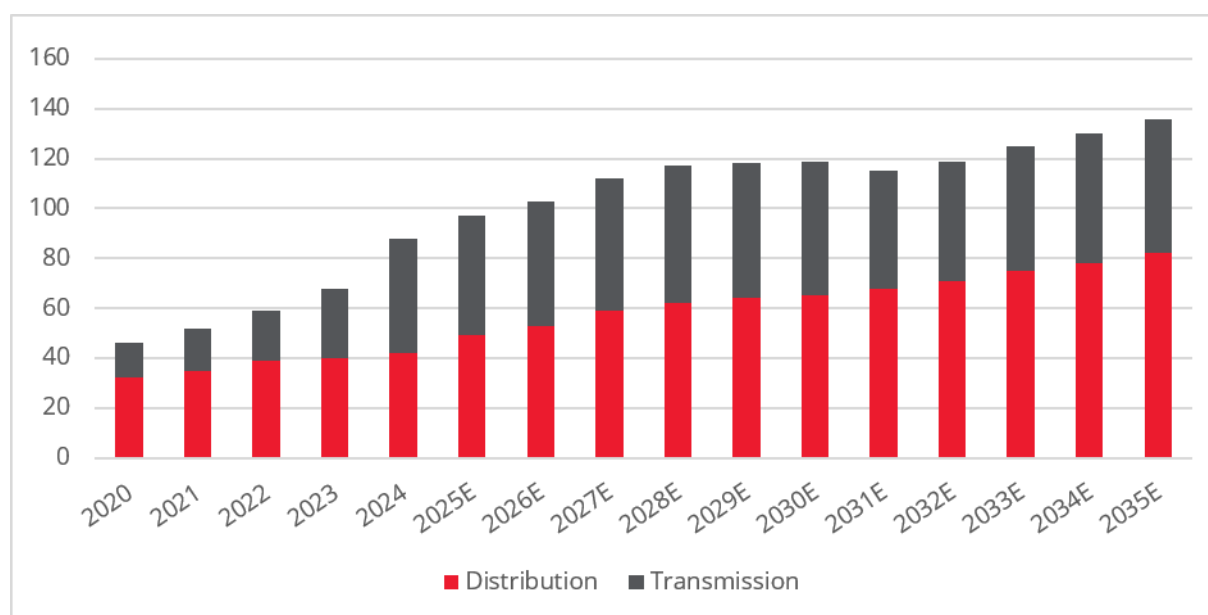
Rising renewables penetration is forcing infrastructure networks and systems to adapt

Further to the ageing infrastructure challenge, the energy transition is triggering additional requirements to adapt infrastructure networks and systems. The pace of global renewables deployment has accelerated since 2020 relative to investments in other parts of the electricity system, such as power networks and storage. This drives a costly system imbalance, which further underscores the urgent need for new investments across the electricity system. For example, grid congestion drives renewable output curtailment, which creates balancing costs that drive up electricity bills. UK balancing costs increased 10% year-on-year to £2.7bn in 2024/2025, driven partly by the inability to transmit excess wind output in the north of the country to meet consumption needs in the south⁵. Furthermore, grid connection delays negatively impact renewable capacity growth momentum.

These effects are most acutely felt in markets with older power grids and/or faster renewables penetration. Ultimately, existing global power networks were not designed to support a system with a growing majority of the power mix coming from renewables, and many need to be modernised. This is mainly due to the intermittent supply profile of renewables and oscillation variations, often at very short notice, which threaten grid stability. The April 2025 Iberian blackout offers a stark reminder of the risks of insufficient timely investment in necessary grid infrastructure.

⁵ [Neso, June 2025](#)

Chart 2: Global grid and storage capex - 2020 to 2035E (EUR, bn)



Source: Goldman Sachs, October 2025. The information shown above is for illustrative purposes. Forecasts and estimates are based upon subjective assumptions.

A major, still-unfunded capex cycle lies ahead

Significant capex will be required to renovate and adapt obsolete infrastructure across OECD economies. Global Infrastructure spending is projected to reach approximately \$7trn per annum by 2050, up from \$4.4 trillion in 2024, with around 50% of this driven by power and transport infrastructure investments, according to PWC's Global Infrastructure Outlook⁶. Nearer term, the IEA estimates that global grid investments should increase by 50% to \$600bn per annum by 2030, compared to \$400bn today⁷.

Governments are conscious of the challenge. In the US, the \$900bn Inflation Reduction Act, passed in 2022, will direct close to \$400bn⁸ towards energy and climate change investments. Germany's €700bn infrastructure plan, approved in 2025, was also a major milestone in that respect. Around 40% of the total budget is likely to be dedicated to power grid investments, with an additional 30% for renewable energy infrastructure. The bulk of the remaining 20% will finance transportation infrastructure.⁹

However, with the vast majority of countries unable to afford such large-scale investment programmes, this raises a major funding gap issue. We think it's likely that most governments will have to rely on regulators to incentivise capex, which would create more supportive regulatory frameworks for future capex.

Rising demand from datacentres has become the key challenge for electricity systems

Datacentres will likely be a key driver of power demand growth across North America and Europe over the next decade and beyond. According to Satya Nadella, the CEO of Microsoft, "The biggest issue we are now having is not a compute glut, ...it's power"¹⁰. Similarly, Nvidia CEO, Jensen Huang has noted that "...predictable access to power is becoming just as crucial as securing semiconductors."¹¹. Rising demand from AI and electrification follows two decades of negligible demand growth and coincides with a period a relative scarcity in baseload power generation across electricity systems.

⁶ [PWC, April 2026](#)

⁷ [IEA, 2026](#)

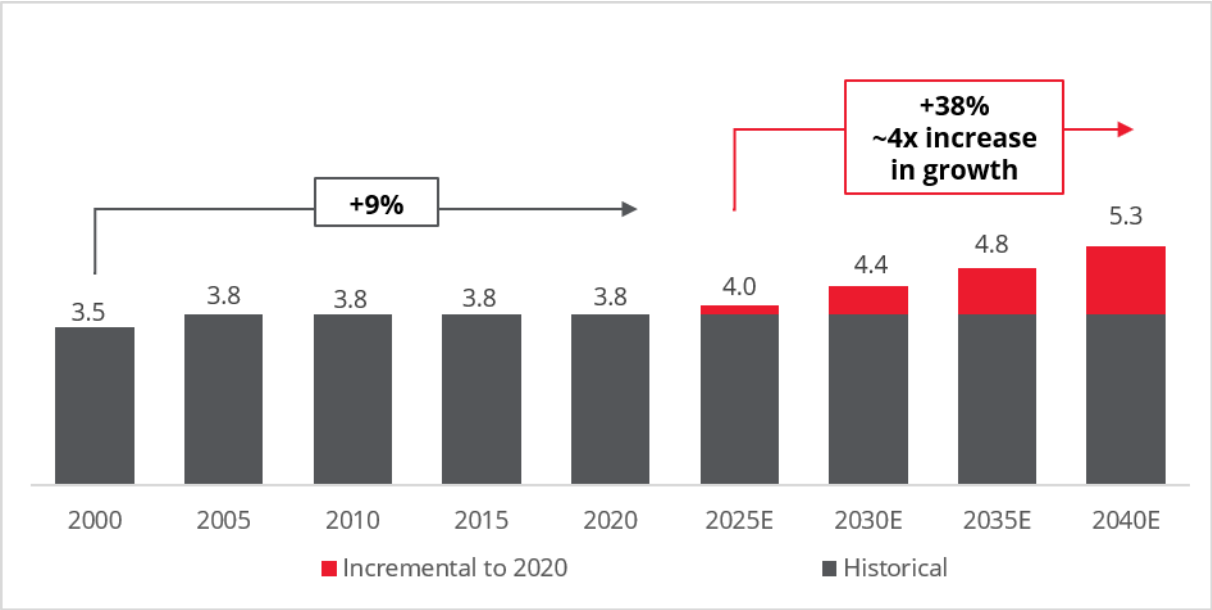
⁸ [IEA, 2025](#)

⁹ Source: Ecofin, BNetzA, AGE, ENTSOE, Goldman Sachs as at October 2025.

¹⁰ [Datacentre Magazine, November 2025](#)

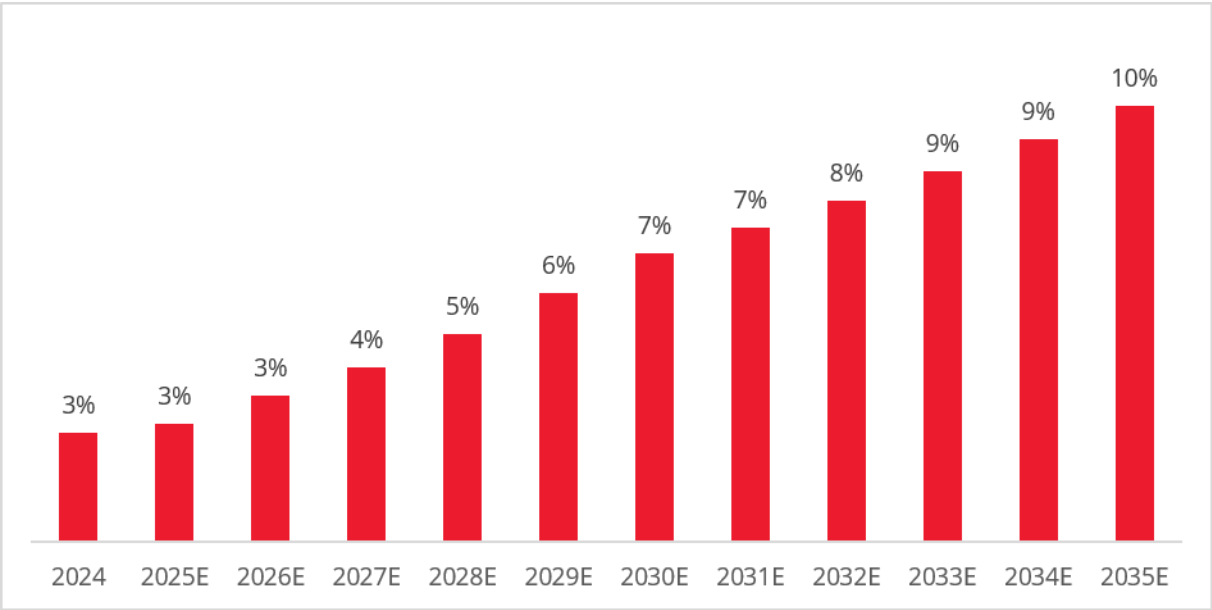
¹¹ [Datacentre Magazine, December 2025](#)

Chart 3: US electricity demand is expected to accelerate (thousand TWh)



Source: McKinsey, Global Energy Perspective, October 2023; EIA, Annual Energy Outlook, 2023, Redwheel. The information shown above is for illustrative purposes. Forecasts and estimates are based upon subjective assumptions.

Chart 4: Datacentre power demand as % of European power demand is expected to rise



Source: UBS, 23 July 2026. The information shown above is for illustrative purposes. Forecasts and estimates are based upon subjective assumptions.

Datacentres are transforming the world of electricity

Power demand growth is accelerating after years of stagnation

While power demand tracked GDP over the 1945-2000 period, it has stagnated or even declined since then as efficiency gains have allowed for a significant reduction in the power intensity of industrial processes and home uses.¹² Lighting is the most striking illustration of this, with current light bulbs using approximately 80% less electricity than their predecessors. Over the past 20 years, power demand has averaged around 0.5% per annum in the US and 0.6% in Europe.¹³ In the UK, we consume roughly 15% less electricity today than in 2000.

¹² McKinsey, Global Energy Perspective, October 2023; EIA, Annual Energy Outlook, 2023

¹³ McKinsey, Global Energy Perspective, October 2023; EIA, Annual Energy Outlook, 2023, UBS, January 2026

Experts consider that electricity demand will increase by around 30% by 2040 in the US and by as much as 50% by 2035 in Europe.¹² Some analysts are even anticipating potential annual growth rates in power demand of 4%.¹⁴ The accelerating trend is driven by a general electrification of the economy, by the rise of electrical vehicles, by new home uses such as heat pumps, and above all by datacentre demand. We estimate the latter is expected to account for at least a third of the next decade's power consumption increase.

Against this backdrop, companies exposed to the datacentre market with spare low-carbon generation capacity appear well positioned, in our view. The dramatic re-rating of listed US utilities groups such as Constellation and Vistra¹⁵ over the past couple of years indicates how transformational the evolution is (see Chart 5).

Constellation Energy signed a 20-year PPA with Microsoft to restart its Three Mile Island nuclear plant in September 2024 and signed another 20-year PPA with Meta in June 2025 for its Clinton Clean Energy Centre plant in Illinois.¹⁶ Vistra has similarly signed long-term PPAs with technology companies and recently acquired 5.5GW of dispatchable gas assets through a \$4.7bn deal with Cogentrix.¹⁷

Chart 5: Constellation and Vistra performance - both are well positioned to benefit



Source: Bloomberg, 20 July, 2026. Normalised to 100. USD. The information shown above is for illustrative purposes. Past performance is not a guide to future results. The prices of investments and income from them may fall as well as rise and an investor's investment is subject to potential loss, in whole or in part.

Datacentre power demand is structurally de-risking utility business models

Demand from datacentres not only represents a major booster to the growth outlook of the power market, it also contributes to a structural derisking of utility business models. The Power Purchase Agreements (PPAs) between power generators and AI operators are typically signed for periods of 20 years, with clauses to renew them for a similar additional period. Pricing and indexation terms are pre-fixed, giving utilities a high degree of certainty over the future cash flows that the contract will generate, independent of fluctuations in external factors such as commodity prices or inflation. This represents a major improvement in earnings visibility and security.

¹⁴ Barclays, December 2025

¹⁵ These securities have been selected to highlight the strategy's investment methodology and is not representative of the strategy's performance. Portfolio holdings are subject to change at any time without notice. This information is illustrative and is not a recommendation to purchase or sell any security.

¹⁶ [Constellation Energy, September 2024](#)

¹⁷ [Vistra, January 2026](#)

The first contract of this type was signed in 2024 between Amazon Web Services and Talen Energy, based on the latter's Susquehanna nuclear plant in Pennsylvania. The agreement is likely to generate \$18bn of revenues over 17 years.¹⁸ Over the past couple of years, US tech companies have signed numerous similar contracts to secure their electricity procurements. We expect the trend to develop further in the US and to reach Europe.

Most utility majors aim to de-risk their business models by extending the life span of their contracts and insulating themselves from external factors. While the top 10 utility groups in Europe were generating close to 50% of their cash flows from merchant-driven power generation activities 15-20 years ago, this proportion has diminished to around 10% only.¹⁹ Meanwhile, those groups have expanded their exposure to fully regulated or contracted businesses. Datacentre agreements are the latest stage in this trend, as are recent investments in power grids, a source of regular and predictable earnings. Recent examples of this include Engie's acquisition of UK Power Networks in May 2026 and, in Europe, RWE's acquisition of an increased stake in Amprion in June 2026. NextEra's \$67bn bid for Dominion announced in May 2026 reflects the same ambition to secure cash flow streams.²⁰

Datacentre operators are relatively power price-insensitive

Datacentre PPA contracts are highly sought after by energy developers, not only because of their longer duration nature, but also because of their associated premium price. Behind-the-meter (BTM) datacentre PPAs in Spain are priced at around a 40% premium to regular PPAs. More broadly, in parts of North America, datacentres are paying up to three times the 20-year historical average price of electricity.²¹ Several contracts have been signed at electricity prices of \$100-120/MWh versus a historical wholesale price of around \$35 on average.²² This phenomenon is reinforced by the scarcity of power generation resources as coal capacity has largely been phased out over the past decade, while investments in carbon-free nuclear capacity have been minimal. At the same time, high demand for power and intense competition among technology companies to maintain leading positions in AI innovation and deployment are pushing prices higher.

Overall, we expect this environment to be a source of enhanced return conditions for incumbent power generators, particularly as company valuations have yet to fully reflect these critical trends, in our view.

Capturing the datacentre power premium

We see a number of solutions that can address the impact of datacentres on electricity systems:

1. Power generators with spare capacity – we see baseload carbon-free/low carbon power producers as a near-term solution to address rising power demand needs, particularly through BTM solutions as grid connection delays present a challenge for datacentre operators.
2. Grid investment – grid connection delays are amongst the most significant bottlenecks for renewable capacity growth to address growing datacentre demand. The European Commission estimates that around €580bn of investment is required by 2030 to modernise infrastructure and integrate renewable energy, addressing hundreds of gigawatts of renewable capacity stuck on grid connection queues.²³ Similarly in the US, onshore wind and solar account for most of the capacity stuck on grid connection queues.
3. Flexible generation – we see batteries as a clean energy solution to the problem of curtailment and intermittency. With increasing durations (up to 6 hours in Italy), batteries can complement wind and solar to provide 40-60% of BTM consumption for datacentres.²⁴ Through hybridisation, batteries can improve renewable project returns by

¹⁸ Powermag.com, June 2025

¹⁹ Bloomberg, Goldman Sachs, Energy UK, Company data, Redwheel, June 2026

²⁰ Company releases

²¹ Company releases, Redwheel, June 2026

²² Company releases, Redwheel, June 2026

²³ [European Parliament, December 2025](#)

²⁴ [Solaria, November 2025](#)

avoiding curtailment and selling stored power during peak-demand hours. Away from generation, we see transmission system operators increasingly using batteries to improve grid stability.

The potential for further re-rating from here

The datacentre build-out is arriving at a time when many power systems are already stretched by ageing assets, rapid renewables deployment and a growing backlog of projects awaiting grid connections. For investors, this signals a multi-year period in which access to reliable, low-carbon electricity becomes a key competitive advantage for both utilities and technology companies.

Listed utilities that can offer that reliability – underpinned by long-dated, premium-priced contracts – are, in our view, still in the early stages of a re-rating. As the capital cycle in grids, baseload generation and flexibility solutions unfolds, we expect the gap between companies that can monetise the datacentre opportunity and those that cannot to widen materially, creating a rich source of potential alpha for active investors.

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