European Infrastructure

Shaping the industry: Electrification, affordability, and AI

May 2026

HSBC Asset Management

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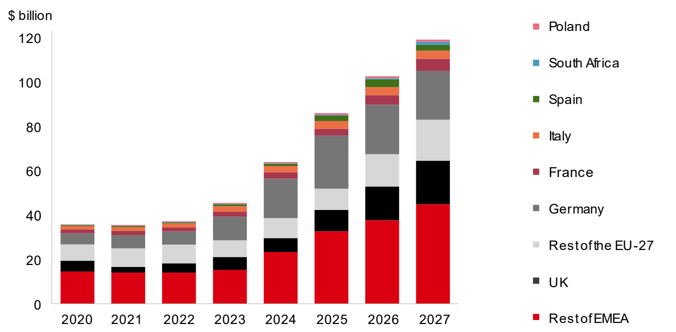
Introduction

European infrastructure investment is being reshaped by decarbonisation and digitalisation, arguably driving the most meaningful infrastructure investment cycles in the post-war era. For context, the European Commission estimates an additional €5.4 trillion of investment will be required for the period 2025 – 2031 to meet climate and connectivity goals and just electricity grid investment alone is estimated to need approximately €584bn of grid investment by 2030.[1] As example, in March 2025 the German Government amended the constitutional debt brake in, in part to establish an infrastructure and climate neutrality fund worth up to €500bn over 12 years.

On the face of it, these drivers are matched by political will and institutional capital. However, under the surface there are tensions between stakeholders. Most notably, balancing the need for investment against the costs to consumers through higher energy bills, while at the same time providing an appropriate return to investors for financing this investment cycle.

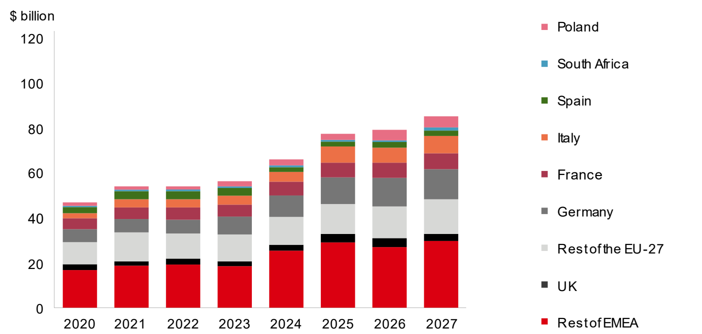
We believe the scale of this investment and the need for capital is transformative for the investment proposition of European infrastructure companies. Within our investment universe, electricity grids, particularly transmission standout. But as we highlighted above, tensions exist which require trade-offs. As such, there is no one size fits all approach across Europe and within sub-sectors. Careful consideration of potential trade-offs is required to assess how they are balanced by governments, regulators and capital markets.

Figure 1: Significant growth in electricity transmission investment…



Source: BloombergNEF

Figure 2: …and electricity distribution vs. recent history



Source: BloombergNEF

Electrification, flexibility and security

Europe's grid was built for centralised, dispatchable generation. It is now being asked to accommodate a system that is becoming increasingly decentralised and intermittent. Over forty percent of the continent's distribution infrastructure is more than forty years old. Across the EU, renewable curtailment cost an estimated €8.9 billion in 2024, with 72 terawatt-hours of clean electricity wasted due to grid bottlenecks.[2]

Millions of heat pumps, EV chargers, and rooftop solar installations are connecting at the low-voltage level, demanding substantial reinforcement. The scale of new connections is an issue faced by multiple European grid companies, one Europe's largest electricity distribution network operators, announced in February 2026 an expanded

[1] European Commission, Grid Action Plan, published November 2023
[2] Aurora Energy Research The State of European Power Grids, December 2025

investment plan of €48 billion through 2030. While at the transmission level, one transmission company has committed €31.6 billion in its business plan for 2024–2028, with its German subsidiary alone accounting for roughly €23 billion, five times the previous regulatory period.

In Italy, the electricity transmission operator has updated its 2024–2028 Industrial Plan to €17.7 billion, with a ten-year Development Plan exceeding €23 billion. The Tyrrhenian Link, a €3.7 billion submarine HVDC cable connecting Sicily, Sardinia, and Campania, and the Adriatic Link between Marche and Abruzzo will ease congestion between Italy's market zones.

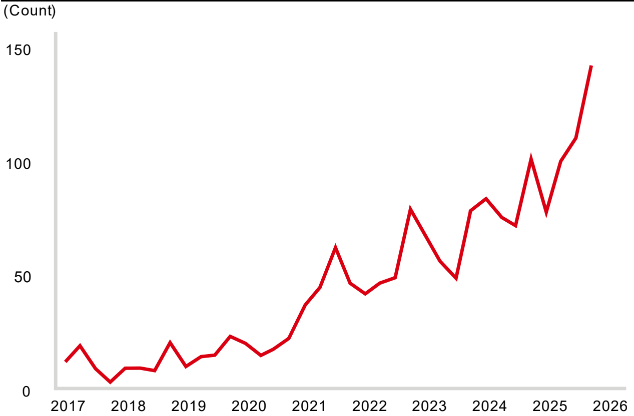
The common theme across all of these plans is not just upgrading and expanding the electricity grid for growing demand and new supply from renewables, it is also to provide a more flexible and resilient electricity grid.

The affordability issue

A natural concern is that the significant increase in infrastructure spending will drive higher energy bills, an issue that is becoming more politically sensitive as investment grows. However, underinvestment is already imposing severe costs. In Germany, compensation for renewable curtailment reached €435 million in 2025, a cost borne by end-users.[3]

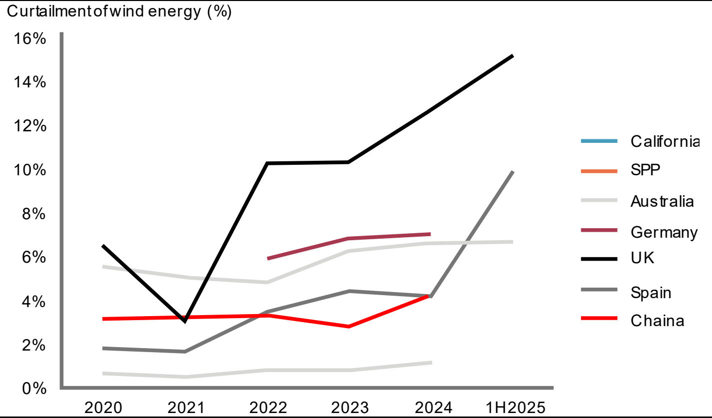
Every new transmission link that relieves a constraint boundary directly reduces the double cost of paying generators to shut down and procuring expensive replacement power. In Italy, new submarine interconnections will resolve congestion between market zones, with the Tyrrhenian Link expected to cut dispatching costs materially in Sicily and Sardinia. Elsewhere in Europe, the Biscay link between Spain France will improve cross-border flows on the Iberian peninsula, where curtailment has become acute. As such, while grid expansion increases costs to end consumers through higher fixed charges, it also alleviating curtailment and redispatch costs.

Figure 3: Affordability – number of company mentions of affordability on S&P500 utility sector earnings calls



Source: S&P Global Market Intelligence; S&P Global Energy

Figure 4: Curtailment of wind energy



Source: BloombergNEF, California Independent System Operator, Australian Energy Market Operator, Red Electrica, National Energy System Operator, Drax, Renewable Energy Foundation, China National Energy Administration, Bundesnetzagentur, SMARD.

Data Centres & AI

In addition to the electrification-driven grid expansion is a demand source that barely featured in infrastructure plans five years ago: data centres. European data centres consumed an estimated 96 terawatt-hours in 2024, roughly three percent of total electricity demand, projected to rise to 168 terawatt-hours by 2030. The EU has set a target to triple data centre capacity in five to seven years.

Figure 5: Global Data Centre New Demand by Region (GW, 2020-2030E)

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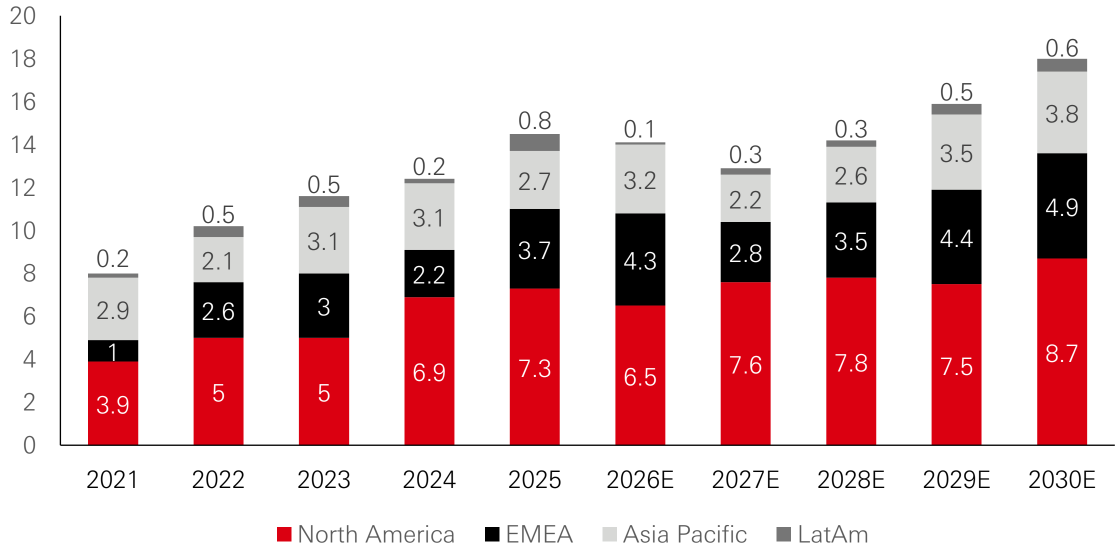
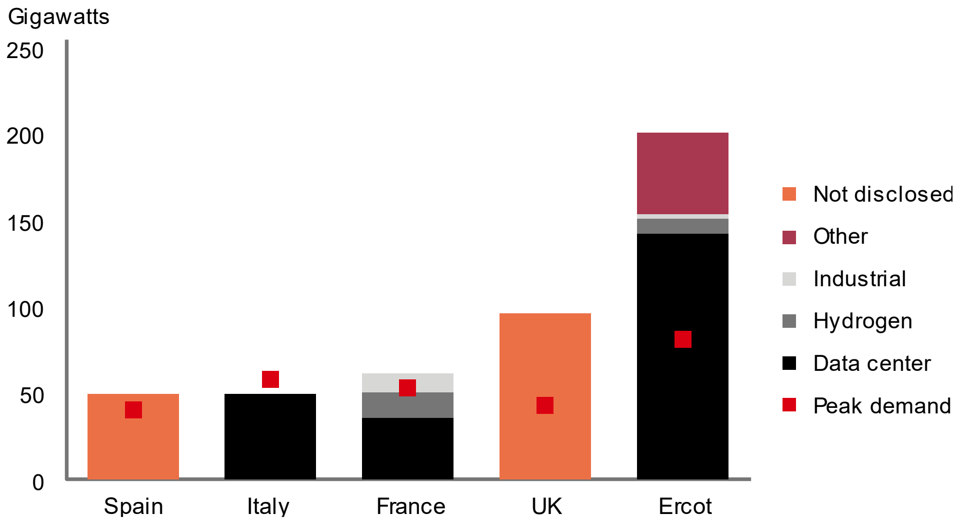
[3] German Economy Ministry, December 2025



Source: IDC, Gartner, Omedia, Berstein Research

Grid availability has become the primary barrier to deployment and, by extension, to Europe's AI competitiveness. Traditional hubs in Frankfurt, London, Amsterdam, Paris and Dublin (FLAP-D) remain core but are increasingly congested. One German electricity distribution company is working to connect 6 GW of data centre capacity in Germany by 2030. In Italy, it has been reported that data centre connection requests increased to over 50 GW by mid-2025.[4] As one industry report noted in 2025, countries investing in grid capacity now will emerge as Europe's data infrastructure hubs; those that do not risk seeing AI investment diverted elsewhere.[5]

Figure 6: Demand queues in selected markets - Datacentres are a key driver



Source: BloombergNEF, Red Electrica de Espana, Reseau de Transport d'Electricite, Electricity Networks Association, Terna, Electricity Reliability Council of Texas.

The data centre boom is also accelerating the digitalisation of the grid itself. Managing a system with high penetration of variable renewables, distributed storage, and large concentrated loads requires real-time visibility and automated control that legacy infrastructure cannot provide. In Italy the electricity transmission company has earmarked roughly €2 billion for digitalisation and innovation within its Industrial Plan, deploying digital twins, IoT sensors, and AI-driven forecasting to optimise dispatching and maximise transmission capacity. The largest European electricity distribution company is rolling out its Intelligent Grid Platform across European markets to create a unified digital backbone for

[4] Italian National Transmission System Operator, December 2025
[5] Ember Energy, December 2025

distribution network management. One German transmission company is investing in algorithmic capacity to boost transmission throughput, while one of its Energy Island projects, which secured €645 million in EU funding, will pioneer a digitally managed hybrid interconnector linking Denmark and Germany. Digitalisation is not a separate theme from grid investment; it is what makes the physical capital work harder and smarter.

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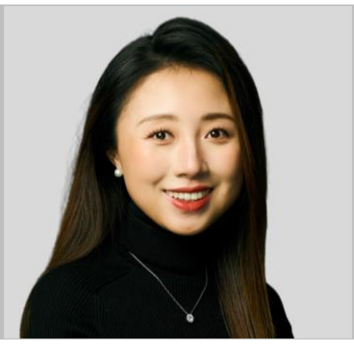

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