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Europe's electricity price premium

A competitiveness risk and infrastructure opportunity

Contents

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Key Takeaways

- Europe's electricity premium is increasingly structural rather than cyclical. The gap between European electricity prices and those in competing regions reflects not only fuel costs but also the cost of resilience, decarbonisation and infrastructure investment in a system increasingly exposed to weather volatility and geopolitical shocks.

- Higher power costs are becoming a competitiveness issue.
Elevated and volatile electricity prices can weigh on inflation, industrial investment and productivity growth, with particularly significant implications for energy-intensive sectors such as chemicals, metals, cement, paper and manufacturing.

- The potential solution creates a multi-year investment theme.
Reducing the electricity premium will require substantial investment in grids, storage, interconnection, flexibility and climate adaptation. Companies that enable electrification and power-system resilience are likely to be among the key beneficiaries of the shifting composition of Europe's energy system.

01

Why is there an electricity price premium?

Europe has a complex electricity supply system which appears increasingly susceptible to **weather-related challenges**. High summer temperatures (as experienced in 2026) have increased cooling demand at times when low river levels and warmer water can restrict the extra nuclear, thermal and hydropower generation needed to meet this demand. For example, during the June-July 2025 heatwave, electricity demand increased by up to 14% in Spain, 9% in France and 6% in Germany, while parts of the thermal and nuclear fleet simultaneously faced operational constraints.

Average daily power prices rose by as much as 175% in Germany, with peak prices exceeding EUR400/MWh.[1] An increasing reliance on renewables for electricity generation (see Figure 2 below) can also cause problems in winter, when weak wind and limited sunlight sometimes reduce wind and solar generation simultaneously (what Germany calls a *Dunkelflaute*).[2]

On top of this, Europe is still adjusting to changed **geopolitical realities.** According to Eurostat, the EU produced 43% of its own energy in 2024, while 57% was imported and is mainly represented by oil & natural gas.[3] The share of Russian gas in total EU gas imports, including pipeline gas and LNG, fell from 45% in 2021 to 19% in 2024 and was projected to decline to around 13% in 2025 following the end of Russian gas transit through Ukraine.[4] Lower pipeline deliveries were partly replaced by LNG. This reduced dependence on a single pipeline supplier but increased Europe’s exposure to global gas prices, critical shipping routes and competition with Asian buyers.

These vulnerabilities became particularly evident when the conflict with Iran effectively closed the Strait of Hormuz in 2026, disrupting a route through which around one-fifth of the world’s daily LNG supply passes and contributing to a sharp rise in European natural-gas prices.[5] In addition, Europe’s marginal pricing system can amplify this vulnerability: according to European Commission data cited by the ECB, gas-fired plants generated 19% of EU electricity in 2022 but set the price 55% of the time, meaning fossil-fuel volatility can still shape industrial electricity costs even as renewables gain share.[6]

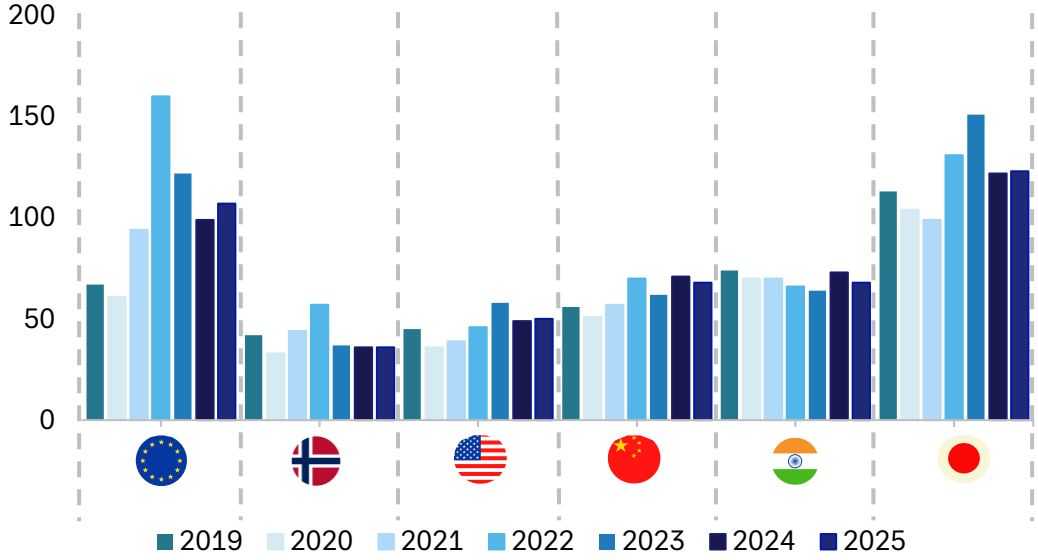
European electricity markets and, ultimately, consumers therefore face two distinct challenges. First, **power price volatility**: short-term fluctuations when national wholesale prices have to match supply and demand, with the availability and prices of imported energy just one relevant factor.

Second, the **electricity price premium**: an apparent structural difference between European electricity prices and those in some competing economies. This price premium also varies significantly within Europe and reflects a number of factors, for example different taxation regimes, energy supply mixes and economic structures; it is not clearly correlated with those national systems relying on a higher contribution from renewable sources.[7] Electricity prices in effect need to fund the creation and maintenance of systems capable of delivering reliable electricity given weather-related constraints and distribution infrastructure requirements. In this sense, the premium is not only a fuel-cost issue; it is also a resilience, flexibility and infrastructure-cost issue.

The European electricity price premium is best assessed through comparable **industrial end-user electricity prices**, as these more directly capture the energy costs affecting European industrial competitiveness relative to competing economies. As Figure 1 shows, this premium has been appreciable vs. the US, China and India over the last few years.

Figure 1: Europe's industrial electricity price premium remains substantial

Estimated final electricity price for large industrial customers in energy-intensive industries, 2019–2025 | USD/MWh



Source: IEA (2026), Estimated final electricity price for large industrial customers in energy-intensive industries, 2019–2025.

02

Macroeconomic and sectoral implications

The macroeconomic implications of this are important. Higher and more volatile energy costs affect European **inflation, industrial competitiveness, investment decisions, consumption and overall economic growth**. Tight supply raises household bills and business input costs, while uncertainty around energy shocks' intensity and duration complicates production, investment and hedging decisions. The effect is not limited to near-term inflation: ECB analysis suggests that an oil supply shock that moves contemporaneous oil prices up by 7% and PPI energy by 1% can reduce firm fixed capital expenditure by 2.9% initially and 4.1% after one year, while R&D spending falls by almost 1%, creating a potential drag on productivity and future competitiveness.[8]

Energy supply concerns are often presented in the news media from the perspective of domestic consumers. However, current and future supply needs must also be considered from an **industrial viewpoint**. Sustained energy-cost pressures may lead companies to reduce output, delay investment or shift production to lower-cost regions. An ECB Working Paper finds that a 10% increase in electricity prices could reduce firm-level employment by up to 2% in the most affected industries, with Southern Germany, Northern Italy and North Rhine-Westphalia particularly exposed.[9]

At a sector level, Chemicals, Metals, Cement and Glass face the greatest **direct exposure** to the European electricity price premium. These account for around 45% of electricity, gas and oil used by EU industry, despite representing less than 4% of EU gross value added.[10] These sectors compete globally and rely on large, often continuous, energy inputs, making them particularly vulnerable to sustained energy-cost differentials versus the US and Asia. Industries such as steel, aluminium, fertilisers, cement, glass and paper are especially exposed because energy represents a substantial share of total production costs.

This **industrial constraint** is important for future network planning.[11] As noted above, heavy industry requires a reliable supply, grid access and energy prices at a level which enables it to maintain industrial competitiveness: failure to deliver these three factors will have implications for European manufacturing, both in terms of where to locate production within Europe and the attractiveness of the region as a whole as a manufacturing base. It is also worth remembering that, while electrification can reduce direct firm-level dependency from fossil fuels' prices, it is not automatic for many industries which may have good reasons (technological, practical or economic) from continuing with other high carbon-emitting energy sources.

External factors could also amplify current stresses on the European electricity supply/demand balance as climate change makes extreme weather events more frequent. A strengthening **El Niño** cycle, which is expected to develop further in the coming months[12], raises the likelihood of significant disruptions to weather patterns, agricultural production, hydropower generation and commodity markets across multiple regions simultaneously.[13] This will likely have repercussions for the European energy system over the course of the next 12-18 months.

Higher global food, metals, fuel and freight costs (due to lower water levels in key transport rivers and canals) could further add to inflation as economic activity weakens. Low water levels on the Rhine provide a useful example: the route transports around 200 million tonnes of goods and fuel each year, and recent low-water disruption reportedly limited some vessels to 10% or less of normal capacity, with tanker barge transport costs rising from about EUR45 per tonne at end-June to EUR130–140 by end-July.[14]

03

Infrastructure requirements

There are various ways to make the European electricity system more resilient, often involving increasing **flexibility. Electricity storage**, for example, can preserve electricity during periods of abundance and deploy it at times of scarcity. **Interconnectors** can make it easier to move electricity between countries and regions. **Dispatchable generation** can increase output when wind and solar generation are insufficient. **Demand management** can reduce electricity consumption during periods of supply stress. Together, these measures support the grid but cannot substitute for its expansion.

There are some success stories here: the EU's operational battery storage grew by 45% in 2025 alone and is now almost ten times as large as it was in 2021.[15] **Longer-duration flexibility** is also likely to become increasingly important. While lithium-ion batteries are well suited to balancing intraday fluctuations, prolonged periods of low wind and solar output or disrupted nuclear and hydro generation may require a broader mix of technologies, including pumped hydro, long-duration storage, flexible hydropower, hydrogen-based storage and dispatchable low-carbon generation. As renewable penetration increases, resilience will increasingly depend on combining short-duration, long-duration and seasonal flexibility solutions.

However, resilience depends on more than flexibility alone. As electricity demand rises from electrification, cooling, data centres and emissions-reduction initiatives across the industrial system, Europe will require simultaneous investment in **network expansion, digitalisation and climate adaptation**.

The grid needs to be expanded. Grid-connection queues now exceed 2,500 GW worldwide across generation, storage and large-load projects. In Europe alone, around **1,700 GW of renewable** capacity is awaiting connection **across 16 countries** – something that, if achieved, would make a meaningful contribution to progress towards **the EU's 2030 renewable-energy targets.**[16]

The effect is already visible in rising curtailment. In Germany, wind curtailment has remained above 5% since 2022, while solar PV curtailment reached 2% in 2024. In the UK, 8.5% of onshore wind generation was curtailed in 2024.[17] Low-marginal-cost electricity is therefore increasingly being left unused because grid capacity and system flexibility are insufficient. Improving resilience is therefore not only about avoiding outages but also about maximising the value of existing low-cost generation assets.

This goes against a background of **rapidly ageing and slowly adapting infrastructure.** Around 40% of Europe's distribution-grid assets are already more than 40 years old, while distribution networks alone are estimated to require EUR375–425bn of investment by 2030. Combined transmission and distribution investment requirements exceed EUR500bn this decade, highlighting the scale of the infrastructure challenge ahead.[18] Yet, major projects can take five to 15 years to complete (or even longer, particularly for nuclear power stations), while a data centre might take 1–3 years, creating a mismatch between the pace of growth in electricity demand, generation and network capabilities.[19] And when storage, interconnection, dispatchable generation and demand response are insufficient, systems rely more heavily on **expensive balancing capacity** (i.e. reserve capacity), and concerns around the adequacy of this capacity can increase price volatility.

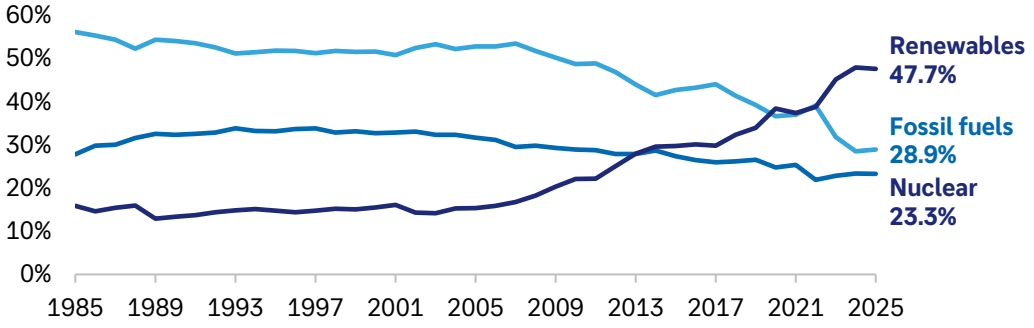
Near-term measures can alleviate some of this pressure. The IEA estimates that non-firm connection agreements and grid-enhancing technologies could together unlock 1,200–1,600 GW of additional grid hosting capacity globally, including 750–900 GW through flexible connection agreements and 450–700 GW through technologies such as dynamic line rating, advanced power-flow control, reconductoring and voltage uprating.[20]

These measures can accelerate connections and reduce congestion, but they do not remove the need for large-scale grid expansion, sufficient firm capacity and climate-resilient infrastructure.

Policy can also have multiple impacts on existing infrastructure's ability to meet demand and maintain resilience. **Carbon pricing** provides an example of this. EU allowances raise the marginal cost of thermal generation when it is needed, but the price effect depends on gas prices, renewable output, demand and interconnection.[21]

Figure 2: EU electricity mix transformation

Share of generation



Source: Ember (2026); Energy Institute, Statistical Review of World Energy (2026); Pinto et al. (2023); UK Department for Business, Energy & Industrial Strategy (2023), with major processing by Our World in Data.[22]

More broadly, the EU's emissions trading scheme (ETS) can affect EU energy resilience by influencing both the composition and efficiency of the energy system. By placing a cost on emissions, it encourages a shift away from carbon-intensive generation towards lower-carbon approaches and technologies designed to reduce energy consumption, reducing the exposure to imported fossil fuels and the geopolitical and price shocks associated with them. (The complementary Carbon Border Adjustment Measure (CBAM) also puts a carbon price on imports of certain carbon-intensive goods.) However, resilience gains depend on complementary investment in grids, storage and flexibility. Without sufficient supporting infrastructure, the transition can increase congestion, curtailment and balancing costs, limiting the system-wide benefits of decarbonisation.

04 Investment implications

For investors, Europe's electricity price premium should be treated as a **cross-asset competitiveness risk**, not simply a utilities or energy-sector issue. The direct portfolio risk is concentrated in energy-intensive industries, but the implications extend far beyond these sectors. The key question is therefore not whether European electricity prices will fall from current levels, but which countries and sectors can sustain competitive power costs in an environment of accelerating electrification, geopolitical volatility, rising data-centre demand and growing climate-related volatility. Such concerns may be one reason behind the valuation premium of US vs. European stocks.

From a country perspective, **Spain** appears to be Europe's most compelling low-cost power market. Renewables generated more than 57% of Spanish electricity in 2024, among the highest shares in Europe, while solar generation alone increased by over 20% year-on-year.

As a consequence, average wholesale electricity prices were approximately EUR65/MWh in 2025, versus EUR90/MWh in Germany and EUR116/MWh in Italy.[23] The primary challenge is **monetisation**. Rising renewable penetration has increased the frequency of negative-price events, shifting value creation away from electricity generation and towards storage, system flexibility and grid infrastructure. Consequently, the most attractive opportunities may lie not in producing power, but in enabling the system to absorb and manage it efficiently.

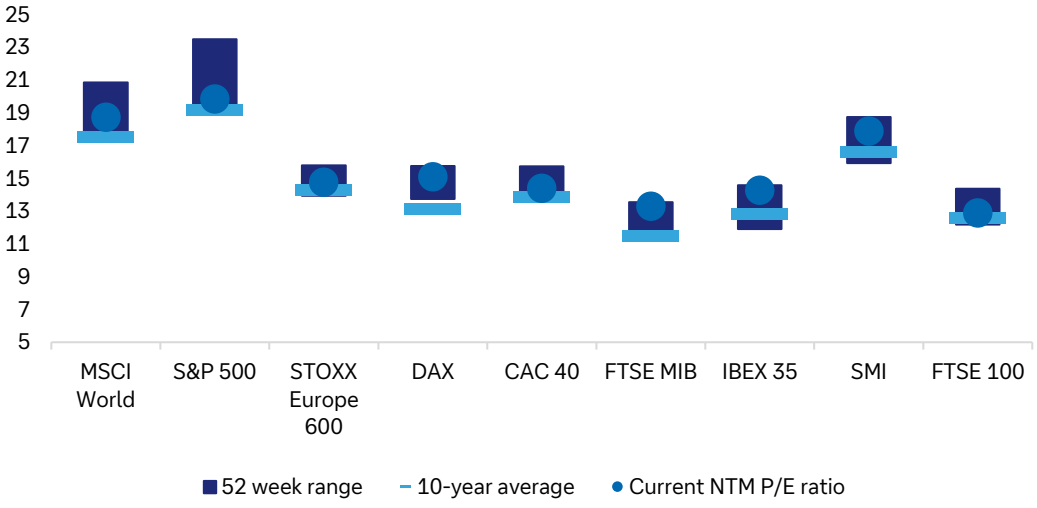
France occupies a unique position due to its large-scale industrial power market. Nuclear generation consistently supplies around 65–70% of electricity production[24], providing lower power-price volatility than most European peers. This gives France a meaningful competitive advantage in energy intensive sectors such as industrial gases, advanced materials but also AI-related infrastructure. However, investors should increasingly focus on physical resilience. Heatwaves, droughts and cooling-water constraints are creating a new form of generation risk that did not feature prominently in valuation frameworks a decade ago.[25]

Germany is Europe's largest investment paradox**.** It is simultaneously one of the continent's most attractive electrification opportunities and one of its greatest competitiveness risks. Germany has the EU's largest industrial base, yet electricity prices remain materially above those in France and Spain. The result is a growing divergence between sectors that benefit from the energy transition and those that will pay for it. Grid operators, electrical equipment suppliers and industrial automation companies stand to benefit from one of the largest infrastructure investment programmes globally. Meanwhile, Germany's industrial base faces a structural disadvantage relative to both US and Asian competitors and much heavy industry has already been displaced. Germany's investment case is therefore increasingly an infrastructure story rather than an industrial story.

Italy remains particularly exposed among Europe's major economies.[26] Electricity prices consistently trade at a premium to northern European markets because of higher gas dependence, limited interconnection and weaker renewable penetration. This raises the hurdle rate for industrial investment and increases the risk of further manufacturing relocation.

Figure 3: Forward P/E ratios

Current, 10-year average and 52-week range



Source: LSEG Datastream, Deutsche Bank AG. Data as of July 31, 2026.

From a sector perspective, we believe the most attractive exposure is **regulated electricity networks**. As mentioned, the European Commission estimates that approximately EUR584bn of grid investment is required by 2030, while ENTSO-E projects over 100 GW of additional cross-border transmission capacity by 2040.[27] Unlike traditional utilities, transmission and distribution operators are benefiting from a rare combination of regulatory support, visible capital expenditure pipelines and growing electricity demand.

As a consequence, regulated utilities' earnings are increasingly driven by regulated asset base growth rather than electricity-price movements, making them direct beneficiaries of electrification regardless of the power-price environment. Notably, equity markets have yet to fully re-rate this theme. European utilities trade on roughly 15x forward earnings, only modestly (8%) above the ten-year median, while consensus expects 7–8% earnings growth for the next three years.[28]

A second beneficiary is the broader **electrical equipment and grid technology ecosystem**. As mentioned in our report **The new age of electricity**, grid investment requires transformers, switchgear, cables, substations and power electronics. This is becoming a capacity-constrained market: the IEA estimates that cable costs have nearly doubled in real terms over the past five years and power transformers have risen by 75%, driven by rising demand and higher material costs for copper, aluminium and electrical steel.[29] Short supply is also reflected in procurement lead times of two to three years for cables and up to four years for large power transformers.[30]

It is important to note that this has been **already at least partially reflected in market performance**. European industrials are expected to deliver approximately 13–15% EPS growth in 2027 and 2028, compared with around 10% for the broader European market, while trading at a forward P/E of roughly 21x, a premium of 24% relative to their ten-year median valuation and almost 40% higher than the 20-year median.[31]

Battery storage offers another structural growth profile. Europe is moving from a power system designed around predictable thermal generation to one increasingly dominated by intermittent renewable supply. Importantly, batteries benefit from almost every major power-market trend simultaneously: rising renewable penetration, negative pricing events, increasing demand volatility, electrification and data-centre growth. For investors, **storage should increasingly be viewed as infrastructure rather than a complementary clean technology**.

Lastly, the European premium also creates a convincing case for companies providing industrial automation, power-management and energy-consumption optimisation technologies. As mentioned, industrial power prices for large European users remain significantly above those in the US and many Asian markets, making energy savings economically valuable regardless of the macroeconomic cycle. Heat pumps, industrial electrification equipment, power-management systems, advanced cooling technologies and energy-management software therefore benefit from a powerful demand driver that is largely independent of GDP growth.

Conversely, the most exposed sectors remain **chemicals, steel, aluminium, cement, glass, paper and fertilisers**. These industries consume a disproportionate share of industrial electricity while competing globally against producers in lower-cost energy jurisdictions. The challenge extends beyond margins. Higher electricity costs reduce returns on invested capital, discourage capacity expansion and increase the probability that future investment is directed towards the US, Middle East or Asia. For many firms, the key issue is not just earnings compression today but the gradual erosion of their long-term competitive position, if they choose to maintain a large share of their productive capacity within Europe.

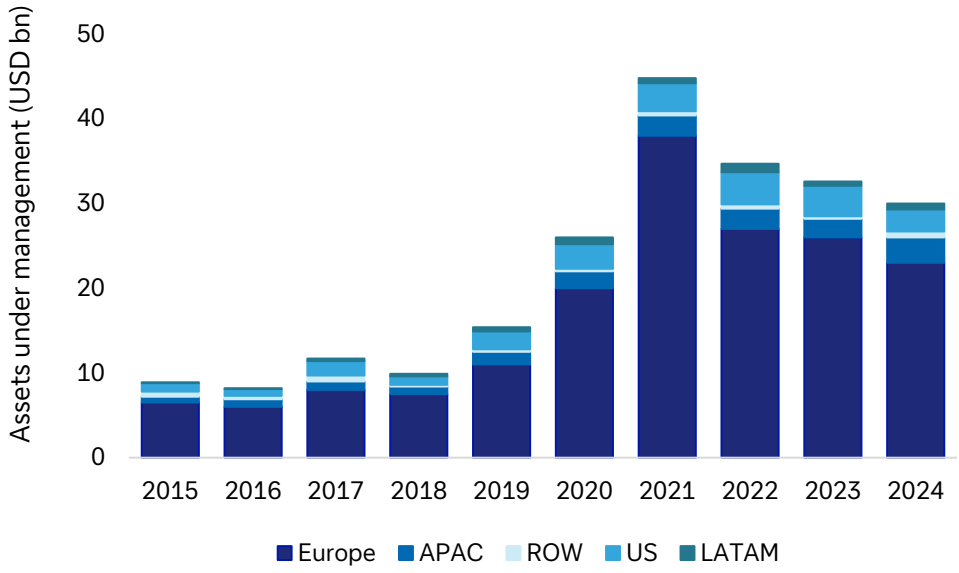
European chemicals, for example, are expected to deliver only around 5% earnings growth in 2027 – roughly half the rate of the broader market – and 2028, despite trading on close to 19x forward earnings vs 15.8x for the broader Stoxx 600.[32] Of course, many other factors may contribute to slow earnings growth, and European chemicals and other firms have already relocated much production outside Europe, but high regional energy costs remain a problem.

From **an investment perspective focused on climate-adaption themes,** Europe does, however, start with some advantages. As Figure 4 shows, Europe accounts for the largest share of adaptation-focused funds, which finance projects designed to support adaptation to climate change. Its leading position reflects a well-established market for investments classified under defined ESG or sustainability criteria, strong regulatory support in addition to rising capital needs across grids, water systems, cooling and climate-resilient infrastructure. The regional concentration also suggests that investors currently have broader access to listed and fund-based adaptation exposure in Europe than in other markets.

However, investments with accompanying ESG or sustainability criteria represent only one channel within the much broader financing requirement. Fund domicile also obviously does not necessarily indicate where capital is ultimately invested. The central investment implication is therefore that the needed mobilisation of mainstream public and private capital across the European electricity system should also ensure that the resulting investment narrows, rather than reinforces, Europe's electricity price premium.

Figure 4: Europe dominates the adaptation fund universe

Assets under management by fund domicile, USD (bn) 2015–2024.



Source: JP Morgan Research (2025); Morningstar; Deutsche Bank processing.[33]

05

Conclusion

Europe's electricity challenge is becoming increasingly structural. Winter *Dunkelflaute* and summer heat have exposed a range of vulnerabilities, not just those related to a higher share of renewables in total output. Achieving reliable electricity supply will increasingly depend on system resilience, including flexibility, storage, interconnection and resilient infrastructure. Electricity markets and, ultimately, consumers face two distinct challenges: short-term **power-price volatility** and the structural **electricity price premium** associated with maintaining a reliable system. The European electricity price premium is substantial.

Higher and more volatile energy costs have both **macroeconomic and sectoral implications**. Higher levels of inflation are just one: uncertainty around energy supply can also reduce investment and growth. **External factors**, notably El Niño, may amplify these implications**.**

For both firms and investors, Europe's electricity price premium – and efforts to reduce it – creates both **opportunities and challenges.** Energy-intensive businesses face greater operating pressure, while firms with secure energy access, pricing power and flexibility should see tailwinds. Providers of grids, storage, cooling, energy management and resilient infrastructure gain a structural growth opportunity.[34]

Ultimately, the key investment question is not whether Europe's electricity price premium disappears. Some level of premium may prove to be a persistent feature of a system designed around security, decarbonisation and resilience. The more important question is whether Europe can ensure that the substantial capital committed to grids, storage, flexibility and low-carbon generation narrows the competitiveness gap over time. Success would strengthen industrial resilience and create one of the world's largest infrastructure investment opportunities. Failure would risk reinforcing the very premium that Europe is seeking to overcome.

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Appendix

Glossary

Adaptation-focused funds invest in companies or projects that help economies adjust to the physical effects of climate change.

Advanced power-flow control uses technology to manage how electricity moves across the grid, helping reduce congestion and improve efficiency.

Capital expenditure refers to spending on long-term assets such as grids, power stations, storage systems or industrial equipment.

The **Carbon Border Adjustment Measure** applies a carbon price to selected imported goods to reflect the emissions linked to their production.

Carbon pricing places a cost on greenhouse gas emissions, aiming to encourage lower-carbon production and consumption.

Cross-asset competitiveness risk refers to a structural risk that affects multiple asset classes, sectors or regions rather than one isolated industry.

Curtailment occurs when electricity generation, often from renewables, is reduced because the grid cannot absorb or transport the available power.

Dunkelflaute is a German term describing periods of low wind and limited sunlight, which reduce wind and solar electricity generation at the same time.

EPS growth refers to the increase in earnings per share over time.

EU allowances are permits under the EU emissions trading system that give companies the right to emit a certain amount of greenhouse gases.

The **EU Emissions Trading Scheme** is a carbon market that requires covered companies to hold allowances for their emissions.

The **forward price-to-earnings ratio** compares a company's or index's current price with expected future earnings.

Fund domicile refers to the country or jurisdiction where an investment fund is legally registered.

The **hurdle rate** is the minimum expected return required before an investment is considered attractive.

LNG stands for liquefied natural gas. It is natural gas cooled into liquid form so that it can be transported by ship.

Power electronics are technologies used to control and convert electrical power, often important for renewables, storage and grid stability.

Return on invested capital measures how efficiently a company generates profits from the capital invested in its business.

Sustainable investing incorporates environmental, social and governance considerations into investment decisions.

Switchgear is electrical equipment used to control, protect and isolate parts of the power system.

Appendix

Historical performance

	16.8.2021 – 16.8.2022	16.8.2022 – 16.8.2023	16.8.2023 – 16.8.2024	16.8.2024 – 16.8.2025	16.8.2025 – 16.8.2026
MSCI World	-8.90%	2.90%	22.50%	16.50%	20.50%
S&P 500	-3.90%	2.30%	26.10%	16.10%	20.70%
STOXX Europe 600	-6.40%	2.80%	12.30%	8.20%	18.80%
DAX	-12.70%	13.50%	16.00%	32.90%	8.50%
CAC 40	-3.60%	10.10%	2.60%	6.40%	9.00%
SMI	-10.40%	-1.20%	10.90%	-0.90%	19.20%
FTSE 100	5.30%	-2.40%	13.00%	10.00%	17.60%
FTSE MIB	-13.00%	22.50%	17.30%	29.10%	25.60%
Crude Oil (Brent Spot, bbl)	32.80%	-9.60%	-4.50%	-17.40%	34.40%
Copper (t)	-15.30%	1.80%	11.00%	7.50%	50.60%
Aluminium	-8.80%	-12.20%	10.70%	12.50%	24.50%

Source: Deutsche Bank AG, Bloomberg Finance L.P., LSEG Datastream; Data as of August 17, 2026.

Appendix

Important note

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