REGIONAL DEEP DIVE

EUROPE

INTRODUCTION

Europe's energy transition is at a pivotal moment – navigating geopolitical disruptions, rising affordability pressures, and divergent national approaches to climate and energy policy. While the region remains a global leader in clean energy innovation, it must confront the realities of aging infrastructure, fluctuating commodity prices, and persistent public concern over cost and equity.

The **2025 World Energy Issues** Monitor reveals a complex picture: strong momentum in renewable integration and digital grid upgrades in parts of **Northern and Western Europe**, contrasted with infrastructure and investment gaps in **Southern and Eastern** regions. Transmission grid expansion remains the region's top action priority, while uncertainty around commodity prices - especially fossil fuels and critical minerals - continues to challenge long-term planning and energy security.

France has committed €100 billion to nuclear and grid expansion, reinforcing its low-carbon leadership. **Germany** is accelerating solar and offshore wind to reach 80% renewable electricity by 2030. In contrast, **Eastern and Southern** European nations continue to face investment barriers, affordability pressures, and permitting delays that slow progress. These divergences underscore the need for shared solutions across Europe's fragmented energy landscape.

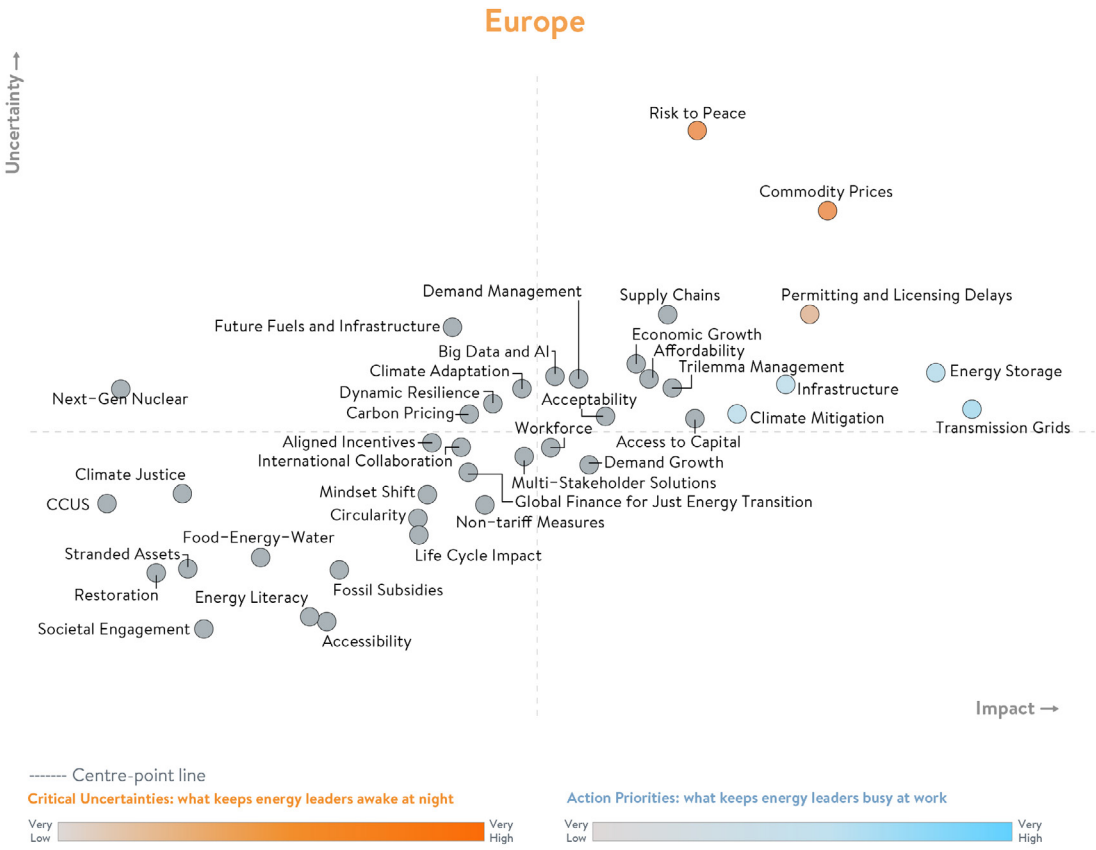
As Europe deepens cross-border collaboration and accelerates electrification across sectors, success will depend on its ability to maintain policy cohesion, address community concerns, and embed social equity into every stage of the transition. The task ahead is to sustain Europe's energy leadership into an inclusive, resilient, and competitive advantage.

ABOUT THE WORLD ENERGY ISSUES MONITOR

Energy transitions are complex, evolving, and deeply interconnected, shaped by shifting priorities, emerging uncertainties, and regional realities. Since 2009, the World Energy Issues Monitor has offered a unique lens into the dynamic forces driving energy transitions worldwide. This year's survey spans 39 core transition issues across six categories – spotlighting blind spots, new signals, and shifting leadership priorities. Amid growing uncertainty, leaders across the World Energy Council community are asking sharper questions: What's working? What can be adapted across regions? And where are the real opportunities to turn blind spots into bright spots?

NOTE ON TIMING AND CONTEXT

The World Energy Issues Monitor survey was conducted between 24 November 2024 and 10 January 2025. The regional workshops that informed the commentary insights took place in the second half of February 2025, before the current trade tensions and the US-led trade tariffs. As such, the regional commentaries should be read in the context in which they were developed, prior to the escalation of current global trade dynamics.



CRITICAL UNCERTAINTIES AND ACTION PRIORITIES

TOP CRITICAL UNCERTAINTY: COMMODITY PRICES

From the vantage point of Europe's ambitious climate agenda, the rollercoaster of global **commodity prices** stands out as a significant disruptor. Despite leading the charge in renewables, Europe remains heavily reliant on imported fossil fuels and minerals. Spikes in gas or battery metal prices can derail clean tech investments, trigger emergency coal restarts, and disrupt policy cohesion as seen in 2022, when gas price volatility prompted coal plant restarts across parts of Central Europe.

- FOSSIL IMPORT RELIANCE VS. DECARBONISATION
  While phasing out coal, some nations substitute with natural gas, exposing them to volatile global gas markets and sudden supply squeezes. This vulnerability hinders the region's otherwise steady drive to cut carbon emissions.

- CRITICAL MINERALS VULNERABILITY
  Europe's high-tech energy aspirations - especially advanced battery manufacturing - demand secure and affordable metals like lithium, nickel, and cobalt. Rapidly fluctuating costs or potential supply chain bottlenecks can derail scale-up of key green technologies.

- POLICY FRAGMENTATION UNDER PRESSURE
  In times of commodity shocks, EU countries often prioritise security measures such as reinstating coal plants or imposing price caps, which can weaken EU climate unity and deter long-term investment.

TOP ACTION PRIORITY: TRANSMISSION GRIDS

Modernising and linking European **grids** top the region's daily agenda, cementing a path for deep electrification while facilitating cross-border power exchanges. Although not free of complexities, infrastructure updates have clearer technical roadmaps than other uncertainties.

- OFFSHORE WIND INTEGRATION
  Large-scale developments in coastal waters demand new high-voltage networks to deliver power from turbines at sea to inland load centres. Although local community and environmental reviews can prolong timelines, the core engineering solutions are well established.

- INTERCONNECTION & MARKET INTEGRATION
  Northern and Eastern Europe can reduce consumer costs and bolster resilience. Projects advanced under REPowerEU highlight the tangible wins of collaborative TSO planning.

- PERMITTING DELAYS
  Despite the impetus for faster green infrastructure, complex bureaucracy for permitting licenses and community resistance can stall or reshape proposed line routes. Early stakeholder engagement - an emerging best practice in some countries - helps maintain social licence while keeping expansions on schedule.

ENERGY-CYBER NEXUS – AI AND GRID RESILIENCE IN EUROPE

- **Data centre growth is amplifying the challenge:** In 2025, Europe is projected to add data centres accounting for 937 megawatts (MW) of power demand, marking a 43% increase from the 655 MW added in 2024. This surge will place further pressure on grid stability and cyber preparedness across the continent.

- **Digitalisation is accelerating grid complexity:** AI-enabled systems and real-time analytics are improving forecasting and load balancing, but also increasing vulnerability to cyberattacks on critical energy infrastructure.

- **Cyber risks are rising across interlinked networks:** As European TSOs expand regional interconnectors and smart grid capabilities, coordinated cybersecurity protocols are essential to prevent cascading disruptions across borders.

- **Resilience depends on investment in both technology and governance:** The EU's NIS2 directive expands cybersecurity requirements, but smaller operators in emerging markets may struggle with compliance and implementation capacity.

BLIND SPOTS AND BRIGHT SPOTS

BLIND SPOTS

- SOCIETAL ENGAGEMENT & COMMUNITY ACCEPTANCE
  Protests over rising power bills in Europe highlight the need for stronger community involvement in energy transition planning. Targeted outreach and education are essential to ensure local populations understand the benefits, costs, and trade-offs of new infrastructure. By actively engaging communities - including younger generations through schools and youth programs - stakeholders can foster trust, build energy literacy, and support inclusive decision-making processes that accelerate climate goals.

- ACCESSIBILITY GAPS
  Even with strong policy frameworks, some parts of Eastern and Southern Europe still lack modern infrastructure. Rising power prices risk deepening energy poverty if affordability mechanisms and infrastructure investment aren't deployed at scale. Closing this divide is essential to achieving a unified and just transition.

- ANTICIPATING THE POWER DEMAND TSUNAMI
  Europe's transition efforts have focused heavily on expanding renewable supply, but growing electricity demand is emerging as a critical blind spot. A surge in consumption is projected from AI data centres, electric mobility, green hydrogen production, and industrial reshoring - what some are calling a "power demand tsunami."

  Without more integrated planning across supply, infrastructure, and demand-side response, this surge could outpace the region's grid resilience and compromise energy security. The challenge is especially acute in countries still recovering from the dual shocks of energy price volatility and geopolitical disruption. Permitting reform alone won't solve it - anticipatory and coordinated planning is now essential.

BRIGHT SPOTS

Despite differing starting points, several countries are making headway by aligning industrial strategy with grid upgrades and innovation.

- FRANCE'S TRANSMISSION GRID AND NUCLEAR STRATEGY
  France announced a €100 billion investment to modernise its transmission grid and expand nuclear capacity. France is reinforcing its position as a domestic and regional low-carbon electricity leader, targeting AI and industrial consumers.

- GERMANY: ADVANCING A NATIONAL HYDROGEN BACKBONE
  Germany is making decisive progress on green hydrogen, with a 10,000 km hydrogen backbone network approved and partially under construction. This infrastructure aims to connect industrial clusters and import hubs, supporting the scale-up of domestic production and future imports while reinforcing Germany's long-term decarbonisation strategy.

- TÜRKIYE'S SOLAR AND WIND MANUFACTURING LEADERSHIP
  Türkiye now leads Europe in solar panel manufacturing and a growing player in wind energy. Localised supply chains are reducing dependency on imports and strengthening resilience.

- AUSTRIA: ON TRACK FOR 100% RENEWABLE ELECTRICITY BY 2030
  Austria is successfully advancing toward its target of achieving 100% renewable electricity by 2030. Strong national coordination, hydropower expansion, and support for solar and wind are helping accelerate the transition, positioning Austria as a frontrunner in Europe's clean power shift.

- EUROPEAN UNION'S GREEN TRANSITION AND INNOVATION STRATEGY
  The EU is focusing on closing innovation gaps and accelerating clean energy adoption, with a goal to lead in clean technologies by 2030. Initiatives like the Competitiveness Compass and cross-border collaborations aim to enhance energy security and decarbonise industrial sectors.

CONCLUSION

Just as observing a flock of birds in flight can reveal emergent patterns, Europe's energy landscape highlights both decisive advances and slower, more fragmented processes. This interplay underscores several key insights:

- **Uncertainty around Commodity Prices** underscores Europe's reliance on imported fuels and minerals, leaving it vulnerable to market volatility that can disrupt long-term decarbonisation plans.
- **Transmission Grids** remain the top action priority, offering a clearer technical roadmap for electrification and regional integration, despite national policy differences and local permitting delays.
- **Blind Spots** – including societal engagement, rising electricity demand, and uneven infrastructure – risk slowing even the most well-designed initiatives. Stronger planning, communication, and equitable investment are essential.
- **Bright Spots** – such as France's nuclear and grid upgrades, Germany's progress on green hydrogen, Türkiye's solar manufacturing ecosystem and Austria's grid decarbonisation – show how targeted policies and coordinated efforts can transform local energy landscapes and deliver tangible climate gains.

Guided by robust strategies like the Competitiveness Compass and cross-border infrastructure collaborations, Europe can continue evolving as a strategic player in energy transitions. The region's future success relies on bridging policy fragmentation, expanding global stakeholder engagement, and accelerating both infrastructure and demand-side measures in pursuit of a Trilemma-balanced energy future.

KEY CONTRIBUTORS

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