



The 2024 World Energy Issues Monitor for Italy highlights the critical importance of securing energy supply chains and critical materials. While the previous survey emphasised renewable energies as the top Action Priority, the current focus has shifted to the infrastructures and technologies that enable these renewables, such as **power grids** and **energy storage**. Italy has long prioritised the energy transition, as evidenced by past World Energy Issues Monitor survey results. However, significant steps are still needed to achieve Italy's ambitious climate goals, with Critical Uncertainties remaining and urgent actions required.

Power grids have emerged as the top Action Priority in Italy. With the growth of renewable electricity generation and increased electrification, robust power grids are essential for enabling the energy transition. Italy's largest power utility [plans to invest](#) EUR 12.2 billion from 2024 to 2026 to expand, modernise, and digitalise the country's grids. This investment aims to enhance grid resilience against climate-related events and improve flexibility in managing peak loads, addressing critical uncertainties and high-impact issues such as climate adaptation and demand-side management.

Regarding **climate adaptation**, beyond reducing carbon emissions and embracing renewable energy, building resilient **infrastructure** is vital for Italy. This is particularly due to the country's high population density, vulnerable soil prone to hydro-geological instability, and exposure to extreme events like fires and floods. Although resilient infrastructure is crucial, Italy's full capacity to adapt remains uncertain. Ensuring reliable infrastructure during extreme circumstances, whether geopolitical or natural, necessitates robust crisis prevention and emergency response mechanisms, including cyberspace and maritime monitoring.

Demand management is a top uncertainty and high-impact issue in Italy. Demand Response resources, where customers adjust their electricity consumption based on grid conditions or prices, hold great potential for system reliability. However, regulatory uncertainty has hindered the deployment of Demand Response programs. The upcoming TIDE (Testo Integrato del Dispacciamento Elettrico) regulation, set to take effect in 2025, aims to address these issues, but many implementation details remain unclear.

The global energy transition has led to a surge in demand for **critical minerals**, identified as a top critical uncertainty. Concerns over supply chain disruptions and the concentration of critical minerals in a few countries, notably China, have been exacerbated by **rising geopolitical tensions**. In February 2023, Italy joined the US-led Mineral Security Partnership (MSP) to strengthen mineral value chains essential for the energy transition. Additionally, WEC Italy launched the [Italian Observatory of Critical Raw Materials for Energy](#).

Artificial Intelligence (AI) is a top critical uncertainty for Italy, essential for **competitiveness** and the development of **decarbonisation** technologies. AI offers unprecedented opportunities to enhance business processes and tools. However, it is crucial to promote responsible AI use while scaling up AI solutions for business.

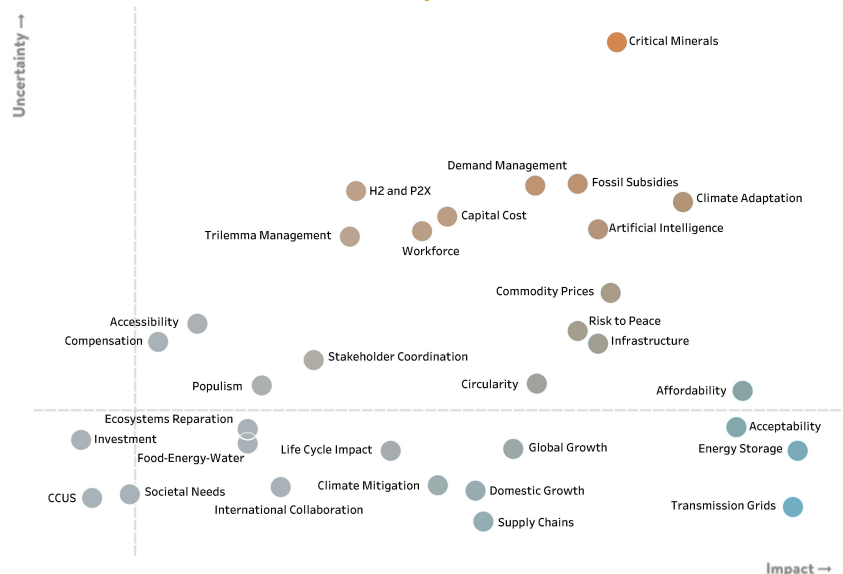
Energy storage has emerged the second Action Priority, crucial for the global deployment of renewable energy. [Italy expects](#) large-scale battery storage capacity to exceed 80 GWh by 2030, and the development of hydroelectric pumping solutions is vital for integrating renewables and ensuring grid stability. This increase depends on securing suitable locations with necessary environmental permits and proximity to renewable energy sources. Energy storage enhances grid flexibility and reliability, improves power quality, and supports the scale-up of variable renewable energies. However, supply chain constraints and revenue security issues, exacerbated by a lack of government support, remain significant challenges that can undermine investor confidence.

Affordability is the fourth action priority. Ensuring reliable, low-cost access to energy is crucial for maintaining the competitiveness of Italy's economic systems during the transition to net zero. Guaranteeing an adequate security of supply through a technology-neutral approach is essential.

The World Energy Issues Monitor also highlights the importance of **circularity**. A circular model overhauls business processes to minimise natural resource withdrawal, favour sustainable inputs, reduce waste through recovery or recycling, and extend product and asset service life. In the energy field, technologies like **Waste to Fuel (W2F)** enhance the energy potential of organic waste by transforming biomass feedstock into bio-oil and biomethane, mimicking natural processes over millions of years in just a few hours.

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Italy



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Critical Uncertainties: what keeps energy leaders awake at night
 Very Low ————— Very High
Action Priorities: what keeps energy leaders busy at work
 Very Low ————— Very High

WORLD ENERGY COUNCIL

Acknowledgements
 Italy Member Committee