

Europe's Energy Security: Energy is the Lifeblood of Modern Society

Global Energy Sector Commentary

May 2025





Abstract

This commentary explores the evolving challenges of energy security in Europe, framed by the outcomes of the 2025 Energy Security Summit and recent large-scale power outages in Spain, Portugal, and France. It examines the complex interplay between energy availability, sustainability, and security—commonly known as the energy trilemma—and assesses the role of legacy energy systems in bridging the

transition to a low-carbon future. Highlighting the urgent need for resilient, inclusive, and pragmatic energy policies, the commentary offers insights into strategic priorities for modernising energy infrastructure while ensuring reliability, affordability, and climate equity.



Commentary Overview



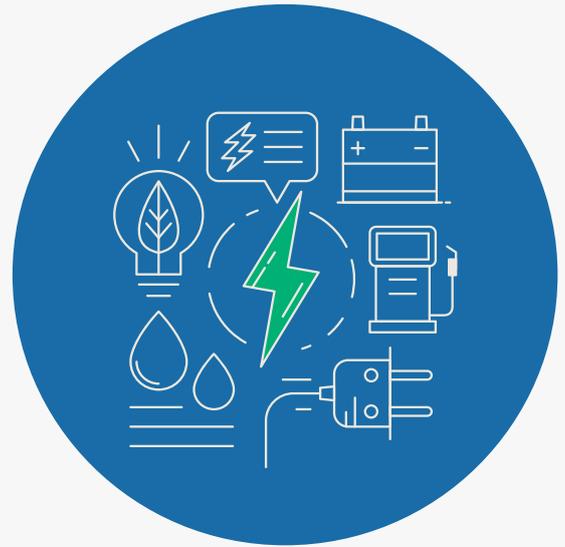
Focusing on the multifaceted nature of energy security, the International Energy Agency (IEA) and UK Government co-hosted an Energy Security Summit on April 24th and 25th, 2025. The Summit brought together about 60 governments and 65 industry leaders, international organisations, civil society and other key stakeholders to discuss a response to the changing nature of energy security. This summit was the first global event to address a 2024 IEA request for research and insight into the future of energy security. Unpredictably, days after the summit on the 28th of April, three European countries experienced a significant power failure. The power outage that plunged some 50 million people into a pre-electric age

evidenced modern society's unquestionable reliance on energy for its functioning; Spain, Portugal, and parts of southern France suffered the worst power outages in recent European history. The incidents highlighted vulnerabilities in Europe's energy infrastructure and underscored the urgency of the energy security issues discussed at the summit. The impact included widespread disruptions to transportation, businesses, and essential services. These incidents have raised various questions on the European energy security, and more importantly the resilience of the European energy systems.

Energy Security at the Fore



Energy is the bedrock of modern society



Conceptualising energy security



Energy is the bedrock of modern society; it cuts across all sectors and contributes to the development of economies around the world. Energy supply, physical availability and affordability are the key components of the energy security. Conceptualising energy security from a legal perspective promotes the uninterruptedness of energy supply proportionate to demand. Unlike the 1973 Arab oil embargo's impact on global energy policy and regulatory frameworks, the Summit underscored energy security as a collaborative imperative transcending governmental and organisational boundary.

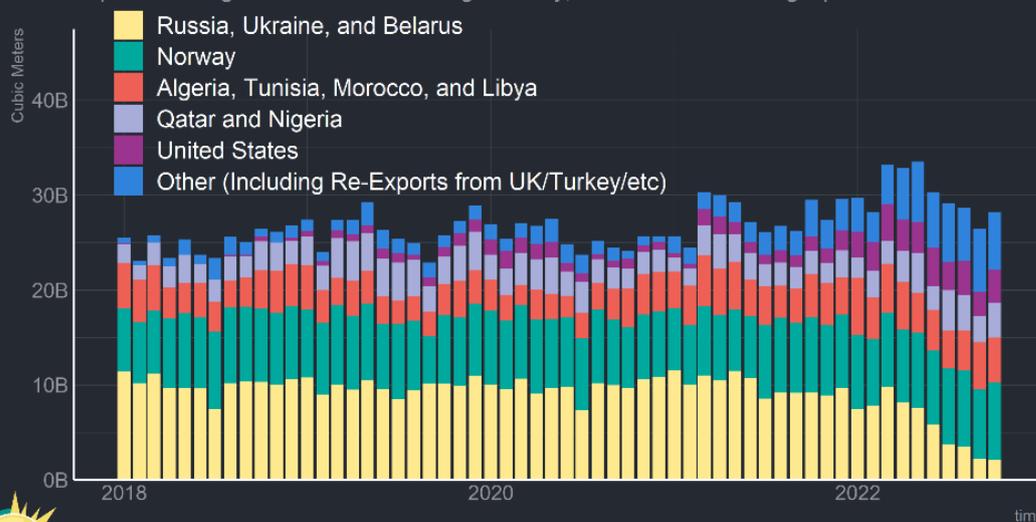
The International Energy Agency (IEA) defines energy security as the uninterrupted, affordable availability of energy sources. Therefore, with energy security, the time-related preferences made by the government and the manner it balances national security, economic and environmental issues are

based on the perspective of the government. The Energy Security Summit ('the Summit') discussed the various dimensions and changing nature of energy security, reiterating that energy, in all its forms, underpins human and economic development. Therefore, securing affordable and sustainable energy for everyone remains a fundamental priority in the coming years, and this goal for governments must never take it for granted.

Prior to the major power failures in Spain, Portugal and parts of France, the British National Energy System Operator (NESO) grid operator was investigating unexplained power plant failures at the Keadby 2 gas-fired power plant in Lincolnshire, which was followed by an unexplained failure of the Viking Link interconnection between the UK and Denmark raises serious questions about resilience and the potential for further widespread blackouts. This prompts crucial

EU-27 Natural Gas Imports

Imports Through Russia are Down Significantly, But the EU is Making Up the Difference

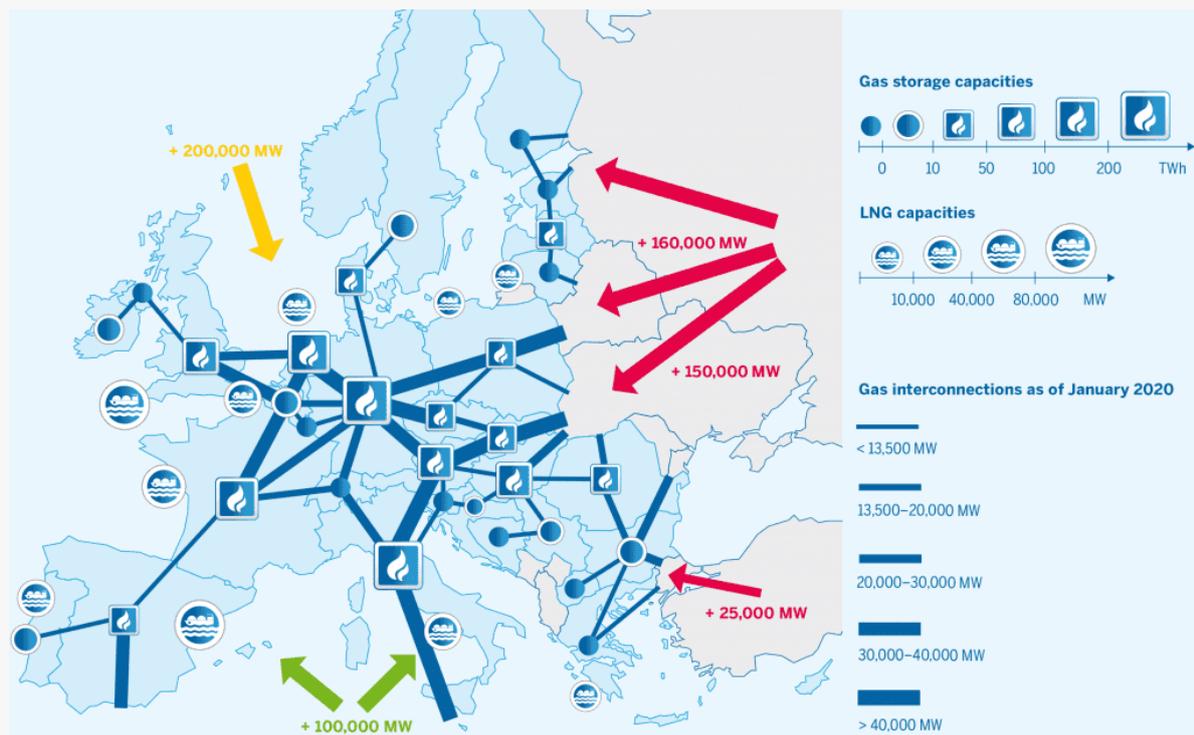


Graph created by @JosephPolitano using Eurostat data

questions regarding Europe's preparedness for large-scale power failures. In the wake of these events, the UK's Energy Secretary, Ed Miliband, asserted the UK's commitment to energy resilience. This raises the broader question of what energy resilience entails for other nations. At CIRUU Energy, we propose a practical path forward, acknowledging that this may sometimes require compromises in decarbonisation efforts. We are aware of the need for further research and analysis to understand the implications of these events and develop comprehensive strategies for enhancing global energy resilience.

Jonathan Elkind of the Center on Global Energy Policy's definition of energy security did not limit it to the availability of energy resources but also included reliability of supply, economic affordability, and sustainability. These necessary elements appear, in principle, to be in conflict. For

example, while the European Union's (EU) push for the increased use of sustainable-renewable energy sources, the immediate needs for energy to fuel economic growth and development often upset the long-term need for climate action. This situation has intensified because of the Russia-Ukraine conflict. The intrepid plans laid out in various themes from the Summit are to boost long-term energy security and independence. As a result of recent power disruptions — from a physical security perspective, and as energy security is an element of national security, there is a need to reassess the longer-term energy policy of Europe, also drawing from the Summit's oil and gas security during a just and fair transition theme which maintains the continued need of oil and gas in years to come as countries increase the use of various forms of renewable energy. Considering the present situation in the energy market, countries are giving top

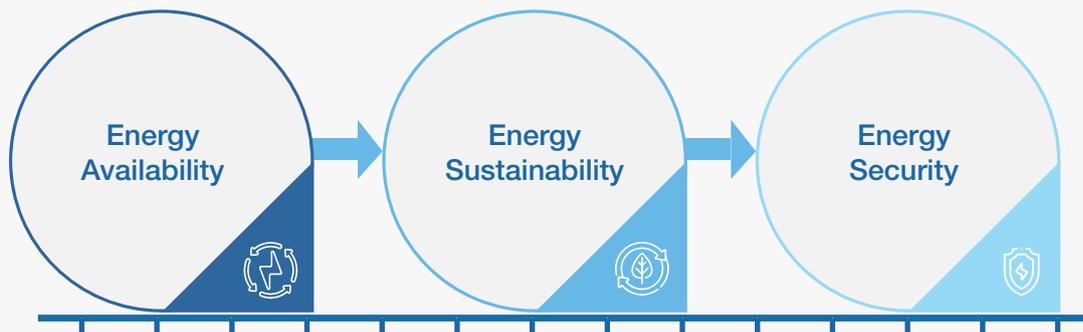


priority to energy security and seeking ways to balance this with broader decarbonisation policies and the achievement of net-zero targets. The change or modification of the old energy systems to factor in the renewable energy systems will not happen overnight. Here lie some of the important roles the old

energy system will have to play in the short term. As some speakers at the Summit speakers highlighted, modernising and expanding grid infrastructure will require high-level investment, as modern lives and economies increasingly depend on electricity.



Navigating the Energy Trilemma: Security, Decarbonisation, and the Role of Legacy Systems



The Energy Trilemma

As highlighted during the Summit, achieving the energy trilemma—balancing energy availability, sustainability, and security—is a complex challenge that requires navigating competing priorities within diverse political, economic, and social contexts. Many countries, especially developing economies, struggle to expand access to reliable energy while ensuring its affordability and environmental responsibility. Efforts to decarbonise energy systems through renewable sources often face intermittent supply issues, limited infrastructure, and high initial costs, which can compromise availability and grid stability. Meanwhile, fossil fuels, although more reliable in the short term, conflict with sustainability targets and exacerbate long-term environmental risks. Practical solutions must be context specific, varied in technology, and rooted in adaptive policy frameworks.

Integrating the principle of energy equity—ensuring universal access to affordable and fairly priced energy—fully addresses the trilemma. Billions of people worldwide still

lack access to modern energy services, which hampers economic development, healthcare, education, and quality of life. This inequity perpetuates global disparities and undermines climate justice. Pragmatic energy policies must prioritise inclusive development by scaling up decentralised energy systems like mini-grids, leveraging low-carbon technologies, and fostering international cooperation and financing. Without intentional efforts to democratise energy access, sustainability and security efforts risk being skewed toward wealthier nations and populations.

Energy security further complicates the trilemma, especially in a world of geopolitical instability and volatile energy markets. Overreliance on imported fossil fuels or critical raw materials (CRMs) for clean energy technologies exposes nations to supply chain disruptions and price shocks. A resilient energy system must diversify sources, invest in strategic reserves, and support domestic innovation in energy technologies, including storage and

Balancing Security and Decarbonisation



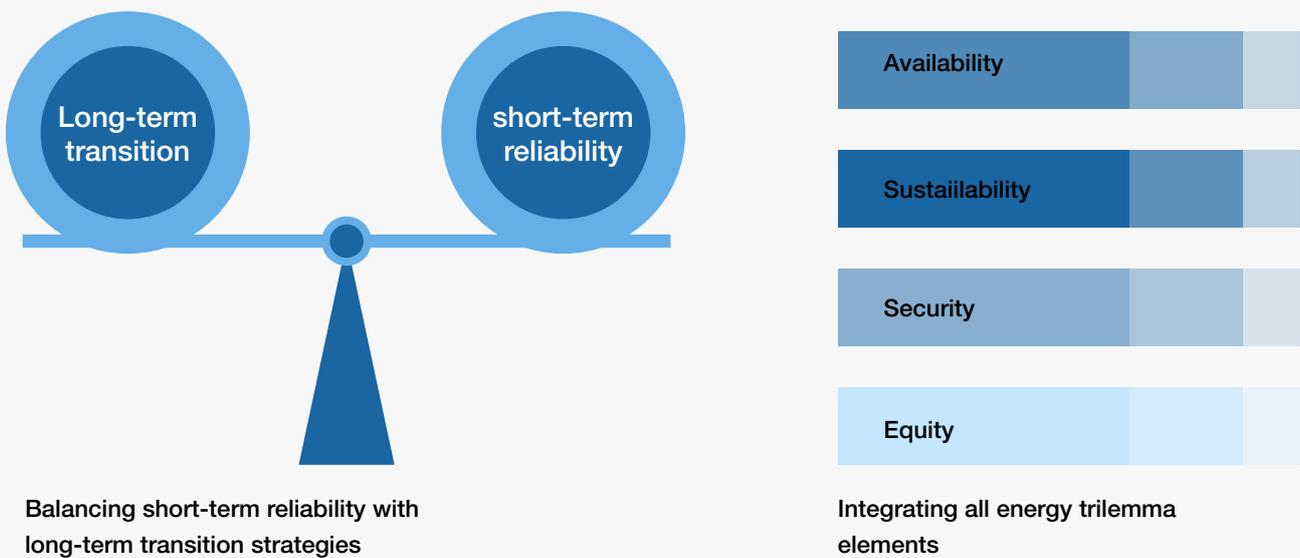
Fossil fuels for baseload power



Grid modernisation



Renewable integration



smart grids. Importantly, pursuing security should not override environmental goals or exacerbate inequalities. A critical, pragmatic approach involves balancing short-term reliability with long-term transition strategies that are inclusive, environmentally sound, and economically viable. Nations can resolve the energy trilemma only by integrating all elements—availability, sustainability, security, and equity.

The current energy market presents a complex challenge: balancing energy security with the urgent need for decarbonisation and the pursuit of net-zero targets. This “energy trilemma” demands a pragmatic approach, acknowledging the inherent tension between ensuring a reliable energy supply and transitioning to renewable sources. A complete overhaul of existing energy systems to incorporate renewables is unrealistic in the short term. Traditional energy systems will continue to play a crucial role in the foreseeable future. Several key aspects highlight this necessity:

- **Bridging the Transition:** The shift

to renewable energy sources is not instantaneous. Existing fossil fuel-based infrastructure will be essential to provide base-load power and address intermittency issues associated with solar and wind energy. This interim reliance requires responsible management of existing resources to minimise environmental impact while maximising the integration of renewables.

- **Grid Modernisation:** The increased reliance on electricity, driven by electrification across various sectors (transportation, heating, industry), demands significant investment in modernising and expanding grid infrastructure. This involves upgrading transmission and distribution networks to accommodate the fluctuating nature of renewable energy sources and ensure grid stability and resilience. The scale of investment required underscores the continued importance of traditional energy sources in funding this crucial transition.
- **Technological Advancements:**

Research and development in carbon capture, utilisation, and storage (CCUS) technologies are vital to mitigate the environmental impact of continued fossil fuel use while transitioning to a cleaner energy system. These technologies, while promising, are not yet mature enough to provide a complete solution, highlighting the interim role of conventional energy.

- **Geopolitical Factors:** Energy security considerations are paramount. Diversifying energy sources and enhancing energy independence often require leveraging existing infrastructure and partnerships, further emphasising

the continuing role of the legacy energy system, at least in the short to medium term.

As agreed, across various speakers at the Summit, the substantial investments needed for grid modernisation and renewable energy integration cause a strategic approach that leverages the capabilities of both traditional and emerging energy systems. The transition to a sustainable energy future requires a managed phasing out of fossil fuels, with responsible and realistic timeliness that acknowledges the essential bridging role of existing energy infrastructure.

The role of legacy energy systems

			
Bridging the Transition Fossil Fuel	Grid Modernisation	Technological Advancement	Geopolitical Factors
Infrastructure is needed to provide reliable baseload power and support renewable integration	Investment in grid upgrades is essential to accommodate increased electrification and renewables	CCS technologies are vital to mitigate the environmental impact of continued fossil fuel use	Diversification of energy sources is key to enhancing security and reducing dependence on fuel imports

Conclusion

The Arab oil embargo of 1973 served as a pivotal moment, forcing governments worldwide to re-evaluate and overhaul their energy policies and regulations. This initial shock, however, pales in comparison to the multifaceted energy security crisis of the present day. Unlike the singular focus on oil in the 1970s, today's crisis encompasses a complex web of interconnected challenges: natural gas shortages, volatile oil prices, coal supply disruptions, electricity grid instability, food security threats exacerbated by energy costs and agricultural inputs, and the overarching urgency of mitigating climate change. This causes not only a diversification of energy sources, but a fundamental transformation of the entire energy system. The challenge lies in achieving this systemic change while ensuring the affordable and reliable provision of energy to populations. The policy responses adopted by governments will play a crucial role in determining the ultimate outcome of this crisis. Success hinges on building

resilience into the energy transition process. This requires a delicate balancing act, progressing on three critical fronts: sustaining economic growth and development, guaranteeing energy security, and advancing environmental sustainability. Failure to navigate these interconnected priorities risks exacerbating existing inequalities and hindering progress towards a more secure and sustainable energy future. The specific strategies employed — from investments in renewable energy infrastructure and energy efficiency measures to the development of robust energy storage solutions and implementing effective regulatory frameworks will influence the effectiveness and equity of the global response. The scale and speed of these efforts will determine whether the current crisis becomes a catalyst for transformative change or a prolonged period of instability and uncertainty.



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