

5th LTES Forum: Broadening LTES to Feature Socioeconomic Aspects

Insights from the World Energy Trilemma 2024

World Energy Trilemma history



At its Centennial Congress, the World Energy Council community commits to the radical redesign of the World Energy Trilemma framework and tool, aiming to extend its use and empower regions, cities, and citizens to manage deeper decarbonization with justice and resilience.





2024

World Energy Council leading the way in measuring and managing energy transitions for almost 25 years.

In 2000, the UN Millennium Declaration was signed. The Millennium Development Goals, formulated in 2001, did not include energy.

In 2012, the UN Sustainable Energy for All initiative began work on the **Global Tracking Framework**, publishing it in 2013.

In the Assessment of

Practices - White Paper,

the Council community

measuring "3 As" - the

country's energy policy

2009

performance of the

Energy Policy and

published the first

framework for

and practices.

The aim of the annual assessment process

was to contribute to more consistent and

0

In 2015, the UN Sustainable Development Goals are adopted, including a goal on affordable and clean energy.

In Energy for Tomorrow's World - Acting Now, the World Energy Council community responds to new demands for energy and sustainable development by establishing three sustainability objectives "3 As": Accessibility to modern, affordable energy for all; Availability in terms of continuity of supply and quality and reliability of service; and Acceptability in terms of social and environmental goals. These

2000

In **Decidina** 0 the Future: **Energy Policy** 2050, the Council community for

the first time assessed the

2007

Scenarios to

World Energy

WORLD ENERGY COUNCIL

ENERGY SECURITY

Reflects a nation's capacity to meet current and future energy demand reliably, withstand and bounce back swiftly from system shocks with minimal disruption to supplies.

ENERGY EQUITY

Assesses a country's ability to provide universal access to affordable, fairly priced and abundant energy for domestic and commercial use.

ENVIRONMENTAL SUSTAINABILITY

Represents the transition of a country's energy system towards mitigating and avoiding potential environmental harm and climate change impacts.

Evolving with Resilience and Justice



Environmental Sustainability: Encompass the global shift away from fossil fuels like oil, natural gas, and coal, towards renewable sources such as wind, solar, and lithium-ion batteries, and the existence of non-negotiable thresholds — planetary boundaries. A more holistic view of environmental impacts, including those associated with mining and mineral extraction. Key concepts such as circularity, biofuels, biodiversity, waterfood-energy nexus), and the importance of securing a social license to operate. ENERGY SECURITY

₿.

ENERGY

EQUITY

Energy Security: Scope has widened to address new challenges, like demand-driven shocks—highlighted by Europe reducing reliance on Russian gas post-Ukraine invasion—and a norm of continuous disruption that spans extreme weather, tech dependencies, critical minerals, and emerging threats to physical and cyber infrastructure.

Energy Equity: Equity has evolved beyond ensuring access to affordable energy; it demands consideration of the interplay between cost, price, and value, and the financial and societal impacts of changes in any of these dimensions—as well as the increased short-term costs of the shift to renewable energy.

Energy Equity- Connecting Cost, Price and Value of Energy

Expanded Metrics for Equitable Energy:

- The definition of equitable energy has expanded beyond access and affordability to consider its role in economic opportunity and societal benefits.
- **Energy equity** now also emphasizes the importance of ensuring that all segments of society benefit from energy transitions.
- **Consumer energy prices** are often distorted by inadequately structured markets or reliance on subsidies. These factors can **obscure real price signals** that reflect supply scarcity or other challenges in the energy system.
- **Upskilling & Workforce Development**: Critical for ensuring a just transition. Extends beyond energy systems to include economic and social dimensions.
- **Cost of Technology & Knowledge Transfer**: Includes upskilling required for deployment and maintenance of new technologies.
- **Productive Energy Use:** redefinition of **modern energy minimum**, beyond existing indicators, which focus mainly on household electricity, report that access to electricity averages 50-100 kWh per person per year. While addressing basic needs, this perspective falls short of capturing the dynamism required for comprehensive economic growth.





Drivers of balancing the energy trilemma

Macroeconomic environment

 capacity of a country to sustain an enabling environment for proactive delivery of energy policy goals

Governance

- effectiveness of government
- political stability and impact on climate policies
- rule of law and regulatory quality of a country
- Energy market re/design

Stability for investment and innovation

- capacity of a country to attract investments and stimulate R&D and innovation
- Social license to operate
- Transparency of contracts



WORLD

ENERGY

COUNCI

YEARS OF

IMPACT

