

**8th AIEE Energy Symposium, Padua**

# Energy Transition: Security, Innovation, and Strategic Leadership"

*Redefining the global  
landscape through resilience  
and technology*

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# *Geopolitics of the Energy Transition*



- Renewables change energy dependencies from fuels to critical materials.
- China controls 70% of global clean tech production and 80% of rare earth processing.
- Investments in renewables reached \$1.77 trillion in 2023, twice that of fossil fuels.

# *Critical Dependencies and Risks*



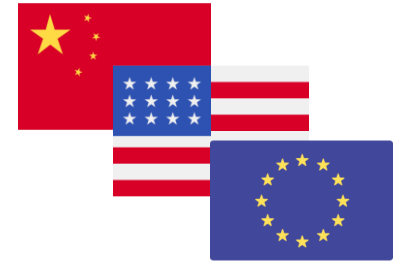
- Top producers of lithium: Australia (53%), Chile (26%), and China (13%).
- Global battery market heavily reliant on Chinese manufacturing, with costs 40-45% lower than Europe.
- 200+ trade restrictions on clean energy technologies introduced since 2020.

# *Technological Vulnerabilities*



- \$310 billion invested in smart grids in 2023 to manage renewable energy intermittence.
- Cyber risks in decentralized systems: attacks on grids can disrupt power supply chains.
- Importance of integrating advanced cybersecurity measures into energy infrastructure.

# *Technological Race: China, USA, Europe*



- Clean tech market reached \$700 billion in 2023, expected to triple by 2035.
- China leads in photovoltaic and battery production, with 60% of new global renewable installations.
- US invests \$230 billion via Inflation Reduction Act; Europe allocates €300 billion via Net Zero Industry Act.

# *Rare Earths and Critical Minerals: Geopolitical Implications*



- Top rare earth processors: China (80%), USA (15%).
- Vulnerability of supply chains to trade restrictions and political tensions.
- Rising global demand for critical materials is reshaping alliances.

# *Europe's Position in the Energy Transition*



- Fragmented market increases costs and reduces scalability.
- 45% higher production costs compared to China.
- EU initiatives: Net Zero Industry Act and RePowerEU with €300 billion in funding.

# *Shaping a Resilient and Competitive Future*

1. Invest in R&D for alternative technologies (e.g., cobalt-free batteries).
2. Build resilient supply chains via partnerships (e.g., Australia, Chile, Africa).
3. Strengthen cybersecurity and grid resilience.
4. Coordinate European industrial policies to compete effectively.

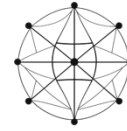




# New Research Paper

# Stay Tuned!

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## **Geopolitics and Energy Transition**

***The strategic value of renewables, between cooperation and competition.***

- National security nexus analysis (long-term), energy policies (medium-term), political risk (short-term)
- Mapping critical assets: technology, resources, timing
- Analysis of key country profiles (China, US, EU, Russia)
- 3 Scenarios and recommendations: national security choices to reduce political risk and structural dependence

***Out in January 2025!***

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Keep in touch with me!

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Thank You