Research. Connect. Lead

Unlocking the power of AI in Europe's energy systems

KEY ARGUMENT

AI can significantly improve the efficiency, flexibility, and decarbonisation of Europe's energy systems, but only if deployed through **coordinated governance**, **quality data** and **strategic investment** at the EU level.

MAIN TAKEWAYS

1 **Accelerate deployment**

👍 Smart grids, predictive maintenance, renewable forecasting, cybersecurity, materials discovery, Energy-as-a-Service.

⚠ Siloed data, legacy infrastructure, "black box" systems erode operator trust.

2 **Foster R&I and coordination**

👍 EU-wide AI energy testbeds; Common European Energy Data Space; strategic open-source models.

⚠ Fragmented funding; pilots that don't scale; workforce skills gap.

3 **Sustainably integrate data centres**

👍 Flexible demand, waste heat for district heating, grid flexibility services.

⚠ ~70% of EU cloud held by 3 non-European providers; grid congestion; local price spikes.

4 **Enhance transparency and oversight**

👍 EU leadership in Explainable AI for Energy (XAI-E); AI Act "high-risk" classification as opportunity.

⚠ No standard explainability metrics; black-box cybersecurity vulnerabilities.

5 **Establish coordination and governance**

👍 Unified regulatory environment; public-private partnerships; EU seal of approval for responsible AI.

⚠ Cross-border governance misaligned; industry reluctance to share data.

THREE POLICY RECOMMENDATIONS

1 **Create an EU AI in Energy Mission Board**
Coordinate funding, host sandboxes for policymaker–academia–industry collaboration, issue an EU seal of approval for responsible AI solutions in energy.

2 **Build secure data and innovation ecosystems**
Implement the Common European Energy Data Space; create a network of AI energy testbeds; mandate interoperability standards to prevent vendor lock-in.

3 **Develop AI in energy competencies**
Require lifecycle sustainability assessments for large-scale AI deployments; redesign curricula; launch EU-wide campaigns to build public trust in responsible AI.

Europe can ensure that digitalisation directly contributes to climate goals, setting a global standard for transparent, fair and sustainable digital energy governance.

EERA
European Energy Research Alliance