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EERA
European Energy Research Alliance

HIGH-LEVEL POLICY CONFERENCE

From science to market – Implementing the Clean Industrial Deal for a competitive, low-carbon Europe

3 December 2025 • TownHall Europe, Brussels & Online

EVENT REPORT

INTRODUCTION

Europe enters a decisive decade in which competitiveness, climate ambition, and resilience are no longer parallel objectives but mutually reinforcing imperatives. As global competition intensifies and geopolitical pressures reshape the strategic landscape, the role of research and innovation (R&I) has moved from important to indispensable. Against this backdrop, the 2025 EERA High-Level Policy Conference gathered policymakers, researchers, industry leaders, and system actors to explore how science-driven solutions can accelerate Europe's pathway from laboratories to markets under the emerging Clean Industrial Deal.

The conference brought together perspectives from across the value chain, anchored by three new EERA position papers on Europe's research-to-impact gap, the governance and deployment of AI in energy systems, and the contribution of low-carbon R&I to resilience and preparedness. This report provides a synthesis of the discussions, highlighting the strategic insights, key arguments and central messages raised throughout the day.

EVENT SUMMARY

Opening remarks

Henk-Jan Vink - President, EERA

The conference opened with a clear reminder of how Europe's policy narrative has shifted over the past decade. While climate change drove much of the policy momentum following the Paris Agreement, today competitiveness, resilience and strategic autonomy stand alongside climate action as core priorities. Henk-Jan Vink emphasised that these themes are deeply interconnected and that the energy transition remains essential to all three.

He highlighted the strength of the EERA community — 250 universities and RTOs across Europe— and stressed that its scientific excellence must increasingly be converted into industrial impact. The three new EERA papers presented during the event were framed as concrete contributions to accelerating this shift.

Henk-Jan Vink, President, EERA

KEYNOTE SPEECHES

Philippe Lamberts - Advisor to European Commission President Ursula von der Leyen, Directorate-General IDEA

The first keynote provided a strategic reflection on Europe's geopolitical and economic position. The Clean Industrial Deal was presented as a natural continuation of the European Green Deal, its industrial and competitiveness-focused counterpart. The shift away from fossil fuel imports was emphasised as both a climate requirement and a means of addressing structural vulnerabilities that continue to limit Europe's strategic autonomy.

The keynote highlighted Europe's institutional and societal strengths, including its commitment to democratic governance, social cohesion and rule-based cooperation. These characteristics were described as competitive advantages in a world increasingly shaped by technological rivalry and geopolitical tension. Long-term investment in research, skills and innovation infrastructures was considered essential for ensuring that Europe can act on its ambitions.

The message was clear: the scale of the current challenge requires coordinated action and investment that move beyond incremental adjustments.

> **We are still spending hundreds of billions every year buying stuff that we burn — often from people increasingly unfriendly to the European Union. That is not a foundation for competitiveness.**
>
> Philippe Lamberts - Advisor to European Commission President Ursula von der Leyen, Directorate-General IDEA

Mariana Mazzucato - Professor at University College London, UCL and Founding Director of the UCL Institute for Innovation & Public Purpose IIPP

The second keynote introduced a mission-oriented perspective on Europe's industrial transformation. The challenges associated with the energy transition, resilience and technological renewal were framed as missions that require clear direction, ambitious public investment and coherent governance. Drawing from mission programmes, the keynote outlined how public institutions can guide innovation by establishing shared goals, using procurement strategically and shaping markets around societal needs.

The intervention drew attention to the disconnect between available financial resources and their deployment. While significant capital circulates within the economy, much of it remains diverted towards non-productive activities, leaving mission-driven investment underfunded. A reorientation of financial governance was therefore presented as central to accelerating Europe's transformation.

Partnership models that deliver broad public value, while avoiding structures in which risks and rewards are unevenly distributed, were emphasised as key elements of an effective industrial strategy. Europe's scientific base and strong public institutions were described as essential assets for this approach.

Joshua Steib, playing Here Comes the Sun

Performance Here Comes the Sun by Joshua Steib

To close the opening block, pianist and climate advocate Joshua Steib performed a piano-poetry piece titled Here Comes the Sun. Blending music and poetry, his performance translated the themes of climate urgency, justice and collective responsibility into an emotional register. The interlude offered a reflective pause in the agenda and underlined that Europe's transition to a competitive, low-carbon economy is not only a technological and industrial challenge, but also a societal journey that must connect head and heart.

Introducing the conference: keynote speeches and piano poetry

INNOVATION HUBS: THE ROLE OF R&I IN BOOSTING EU COMPETITIVENESS

Presentation of EERA position paper "From lab to leadership: bridging Europe's research-to-impact gap"

Ivan Matejak - SET Plan & Strategic Programming Director, EERA

Presenting the report "From lab to leadership: bridging Europe's research-to-impact gap", Ivan Matejak outlined Europe's persistent difficulty in converting scientific excellence into industrial strength. He identified five systemic challenges: fragmentation, insufficient de-risking instruments, skills shortages, regulatory barriers, and limited access to research and technology infrastructures.

The proposed EERA Innovation Hubs offer a coordinated, pan-European response, conceptualised not as new institutions but as connecting platforms that align stakeholders, accelerate de-risking, and support a continuous innovation pathway.

Panel discussion

Davide Amato - Deputy Head of Unit, Clean Energy Transitions, DG RTD, European Commission

Amato outlined how the European Commission is working to create a more coherent and predictable innovation pathway across Europe. He highlighted efforts to address the lack of strategic investment and de-risking mechanisms through the proposed Framework Programme 10 (FP10) and the European Competitiveness Fund, aimed at creating a continuous pathway from low-TRL research to market deployment. He noted that the forthcoming ERA Act and Innovation Act seek to reduce fragmentation and offer clearer framework conditions for research and innovation. Amato also underlined the need to simplify access to funding, accelerate evaluations and calls, and use broader, challenge-driven topics to speed up solutions. He emphasised that innovation hubs could play a central role in orchestrating the de-risking chain and providing a one-stop point for regulatory advice, data spaces and permitting—helping to prevent innovation leakage and retain scaling activities within Europe.

> **What we want to make sure is that if you want to do research or if you want to do innovation in Europe, that you have the right conditions to do it here from TRL1 up to scale-up.**
>
> Davide Amato - Deputy Head of Unit, Clean Energy Transitions, DG RTD, European Commission

Maurits Ornstein - Managing Director, Hitachi Energy

Ornstein offered the perspective of an industry working at full speed to deliver the energy transition but increasingly constrained by skills shortages and regulatory uncertainty. He stressed that Europe's competitiveness depends on predictable, long-term policy frameworks that allow companies to commit major investments in new technologies and manufacturing capacity. Drawing on Dutch offshore wind development, he showed how stable policy signals enable focused innovation and cost reductions, and he reminded that breakthrough solutions often begin as high-risk ideas that require room for experimentation and failure.

Prof. Henry Jeffrey - Head of Policy and Innovation Group, The University of Edinburgh and EERA Joint Programme Coordinator Ocean Energy

Henry Jeffrey emphasised that Europe's innovation challenges cannot be solved by addressing any single barrier in isolation. Drawing on the UK experience, he argued that success requires all components of the innovation chain — research, supply-chain capabilities, infrastructure, skills, and enabling regulation— to advance together under clear leadership. Jeffrey stressed that disruptive innovation is essential for long-term competitiveness and that the research community plays a dual role: delivering future-oriented breakthroughs and providing impartial, evidence-based advice in a landscape often shaped by strong lobbying pressures. He highlighted that well-coordinated ecosystems attract investment, and that innovation hubs can help ensure coherent action across research, industry, policy and finance by reducing risk through trusted, science-driven coordination.

Pietro Bernardara- Director of European Projects, EDF

Pietro Bernardara brought an industry perspective grounded in hands-on innovation experience. He described how EDF's high-temperature heat-pump innovation required ten years and four separate funding instruments, from PhD work to H2020, Horizon Europe and national support, illustrating how fragmented pathways slow deployment to an unsustainable pace. Bernardara stressed that Europe must simplify and accelerate its funding architecture, remove sequential bottlenecks and better integrate low- and high-TRL work. Skills shortages, particularly in sectors such as nuclear and AI, were identified as structural threats to Europe's ability to scale technologies. He argued that collaborative, cross-disciplinary innovation, from engineers to social scientists and economists, is essential to shorten time-to-market and develop viable business models. Bernardara welcomed the Innovation Hubs concept as a potential place of leadership capable of guiding actors "from blue-sky research to market uptake" and ensuring that all pieces of the value chain move together at speed.

Panel Discussion 1 - Innovation Hubs: The role of R&I in boosting EU competitiveness, moderated by Anna Gumbau

Ivan Matejak - SET Plan & Strategic Programming Director, EERA

Position paper "From lab to leadership: bridging Europe's research-to-impact gap"

AI for energy and energy for AI: how do we bridge the gap between ambition and feasibility?

Presentation of EERA position paper "Unlocking the power of AI in Europe's energy systems"

Julio Serrano - Applied AI Scholar, University of Vaasa

Presenting the report "Unlocking the power of AI in Europe's energy systems", Julio Serrano highlighted the growing mismatch between Europe's AI ambitions and the infrastructure, data quality and governance frameworks required to achieve them. He emphasised that energy systems are becoming more complex and interdependent, yet the datasets used to operate them remain fragmented, inconsistent and often inaccessible. Without shared, high-quality and interoperable data, he noted, AI cannot support the transition in a meaningful or trustworthy way. The presentation outlined several structural challenges: the dominance of opaque "black-box" models, the lack of AI-ready infrastructure in Europe, and the rising computational and energy demands associated with advanced machine-learning tools. Serrano stressed that Europe must adopt a coordinated, value-aligned approach, one that embeds transparency, explainability and human oversight at the core of AI deployment in critical energy applications.

Julio Serrano - Applied AI Scholar, University of Vaasa

Panel discussion

Vincent Berrutto - Head of Unit, Digitalisation, Competitiveness, Research and Innovation, DG ENER, European Commission

Berrutto outlined the European Commission's work on a forthcoming Strategic Roadmap for Digitalisation and AI in the energy sector. Building on more than 320 responses to a recent public consultation, he noted that stakeholders consistently identify data access and interoperability as the primary enablers for deploying AI at scale. Berrutto explained that the planned Common European Energy Data Space will not centralise data, but instead establish shared standards, rules and governance structures that allow secure, cross-border exchange. This would enable innovators, SMEs and system operators to develop AI-based services that function seamlessly across all 27 Member States. He emphasised the need for stronger coordination across sectors, particularly mobility, where vehicle-to-grid opportunities depend on interoperable data, and highlighted the importance of clear governance frameworks and improved digital skills to support implementation.

Norela Constantinescu - Deputy Director, Innovation and Technology Centre (IITC), IRENA

Constantinescu placed Europe's AI progress in an international perspective, noting that Europe remains a frontrunner in deploying digital and AI solutions in the energy sector, though with different strengths compared to North America and Asia. She emphasised that data quality, timing, standardisation and interoperability remain foundational challenges across all regions. Without reliable and well-structured data, she observed, AI cannot meaningfully support optimisation or system-wide coordination. She also stressed the importance of cybersecurity and trust, particularly in the power sector as critical infrastructure. Persistent hesitancy around data sharing in some countries highlights the need for clearer governance and stronger incentives. Constantinescu pointed to a widening skills gap in digital and AI and underlined that demonstrating concrete system-level benefits —through clear use cases— is essential to overcoming resistance and integrating legacy systems.

Volker Hoffmann - Research Scientist, SINTEF and EERA member

Hoffmann offered a view from applied research, highlighting how organisational readiness remains a major bottleneck for deploying AI in real-world settings. He noted that many promising research outputs fail to scale because companies lack the internal skills and structures needed to take prototypes forward, often relying on a single enthusiastic individual rather than an embedded capability. Hoffmann stressed that AI readiness is therefore as much about people and processes as it is about technology. He emphasised the importance of semantic interoperability and data-space architectures that allow models to be trained and reused across contexts, and reminded that many high-value applications in the energy sector do not require large, compute-intensive models. Significant benefits can already be realised through efficient optimisation, statistics and machine-learning tools that support system operators and value-chain actors with practical, low-energy-demand solutions.

Julio Serrano - Applied AI Scholar, University of Vaasa

Serrano expanded on the structural challenges facing Europe as it seeks to apply AI at scale in the energy system. Speaking as both an AI researcher and practitioner, he warned that Europe's limited computing capacity places it at a disadvantage compared to global competitors, yet stressed that the true bottleneck is access to large volumes of high-quality, interoperable data. Serrano explained that training effective sector-specific AI models requires datasets spanning Europe's full geographic and operational diversity, and that unlocking them will demand strong policy intervention and incentives for data sharing. He argued that Europe's competitive edge lies not in replicating giant AI infrastructures elsewhere, but in developing efficient, fine-tuned models rooted in trustworthy data and robust governance. Serrano highlighted the need to distinguish between privacy concerns of consumer applications and the operational data needs of critical energy systems, noting that energy-sector AI requires its own regulatory logic.

> **We won't lead in AI by building the biggest infrastructure, but by training the smartest models on the best data.**
>
> Julio Serrano - Applied AI Scholar, University of Vaasa

Panel Discussion 2 - AI for energy and energy for AI: how do we bridge the gap between ambition and feasibility, moderated by Anna Gumbau

Strengthening Europe's energy resilience and preparedness

Presentation of EERA position paper "Resilience and preparedness in Europe's energy transition: the role of low-carbon energy R&I"

Rosita Zilli - Policy Director, EERA

Rosita Zilli introduced the new position paper by reflecting on the scale and diversity of Europe's evolving risk landscape. Drawing on a risk pyramid, she explained how geopolitical tensions, structural changes linked to renewable integration, climate-driven shocks, and hybrid cyber-physical threats together redefine what resilience must mean for Europe's energy system.

She emphasised the importance of a systemic perspective—one that accounts for interdependencies, vulnerabilities and the speed at which disruptions now propagate. Zilli outlined three clusters where low-carbon R&I plays a decisive role: technological and system robustness; anticipatory governance and planning; and the societal dimension, including participation, communication and trust-building. She stressed that preparedness must be embedded "by design," supported by policies that acknowledge research and innovation as core enabler of resilience.

Panel discussion

Ruud Kempener, Deputy Head of Unit, Energy Security and Safety, DG ENER, European Commission

Kempener emphasised that Europe's energy security challenge is shifting from traditional concerns about fossil-fuel imports to a broader question of system resilience. While the EU still relies on external suppliers for two-thirds of its energy, he argued that the emerging clean-energy system requires new forms of preparedness—addressing climate risks, cyber-physical threats, and the increasingly rapid dynamics of electricity systems where disruptions unfold in minutes rather than years. Kempener highlighted the need to modernise the EU's energy-security framework, moving from siloed views of gas, oil and electricity toward an integrated approach supported by real-time data exchange. He also stressed that distributed energy resources, energy communities and industrial actors must be meaningfully involved in resilience planning, noting that governance structures have not yet adapted to this growing decentralisation. Finally, he underscored the importance of societal engagement and anticipatory preparedness as essential pillars of future resilience, alongside technical measures and emergency-response capabilities.

> **Simply looking at the numbers, while we are progressing rapidly with the energy transition, we're still 67% dependent on imports. And that's a lot.**
>
> Ruud Kempener, Deputy Head of Unit, Energy Security and Safety, DG ENER, European Commission

Bernard De Clercq - Group Head of EU Affairs, Elia

De Clerq offered a system operator's perspective on Europe's resilience challenge, stressing that reducing fossil-fuel dependence remains the fastest way to strengthen energy security. He underlined that reinforcing the high-voltage grid is essential, not only to integrate renewables, but to deepen interconnection and reduce exposure to external shocks. He warned that Europe cannot meet its infrastructure needs with current funding levels and called for new approaches, including closer alignment with defence budgets and tax structures that no longer favour fossil fuels.
De Clerq also highlighted rapidly evolving security threats (cyber-attacks, physical intrusions and extreme-weather events) and stressed the need for stronger public-private cooperation and clearer roles and responsibilities. Resilience measures, he argued, must remain economically viable, enhancing robustness without undermining affordability.

Heather Grabbe - Senior fellow, Bruegel

Grabbe argued that Europe must rethink security through a comprehensive, mission-driven lens that treats defence preparedness, climate adaptation and the energy transition as interdependent challenges. She stressed that clinging to short-term cost considerations undermines both competitiveness and resilience, noting that Europe spends vast sums each year on fossil-fuel imports and subsidies that deliver no long-term value. Drawing lessons from Ukraine, she highlighted how ageing, centralised systems heighten vulnerability, while wider grid integration and distributed renewables improve resilience to both attacks and climate shocks. Grabbe underscored the need to align fiscal, industrial and circular-economy policies, particularly by recovering critical raw materials already embedded in Europe's economy. She called for better-designed price signals and incentives that enable households and firms to invest in resilience, arguing that Europe cannot afford to postpone structural change.

Nils Røkke - Executive Vice President Sustainability, SINTEF and EERA Vice President

Røkke highlighted how perceptions of Europe's resilience challenges vary significantly across Member States, noting that countries closer to geopolitical fault lines often place far greater emphasis on cyber-physical risks. He stressed that true preparedness requires both strategic autonomy in critical components and the capability to repair and replace assets rapidly, supported by adequate storage and supply-chain resilience. Røkke argued that the traditional energy "trilemma" still holds, but now includes a new dimension: the weaponisation of energy, which Europe had underestimated prior to recent crises. He identified advanced system-modelling and sector-coupling tools as a key blind spot, emphasising that Europe lacks integrated models capable of simulating shocks across electricity, gas, hydrogen and CO_2 networks. This limits the ability to anticipate cascading failures and train for extreme events. Røkke also pointed to cyber threats as an escalating concern, citing real incidents that demonstrate vulnerabilities even in systems thought to be insulated from digital intrusion. Looking ahead, he called for stronger research efforts on materials, circularity and supply-chain independence to support the massive electrification Europe is now entering.

> We shouldn't be seeing these things as a trade off. ... If we keep postponing key elements of the transition and we keep staying in a high carbon economy, that is going to cost us enormously in competitiveness, not by 2050, but just in the next few years...
>
> Heather Grabbe - Senior fellow, Bruegel

Rosita Zilli - Policy Director, EERA

A conference attendee takes the floor to ask a question, sparking an interactive exchange with the panel

Panel Discussion 3 - Strengthening Europe's energy resilience and preparedness, moderated by Anna Gumbau

Closing Speech

Adel El Gammal - Secretary General, EERA

Adel El Gammal closed the conference by returning to a central theme echoed throughout the day: trust. Trust in Europe's ability to act, trust in collaboration across countries and sectors, and trust in the scientific community's capacity to guide the transition with integrity and foresight. He noted that Europe stands at a turning point, faced with converging crises but equipped with the knowledge, values, and technological capabilities required to navigate them.

> **Thank you very much for being here, for your insights and for your trust in EERA and trust in what we do together. And I hope that this day has shown again the strength of this community, the strength of collaboration, and the strength of Europe when we work together**
>
> Adel El Gammal - Secretary General, EERA

EERA's three new position papers presented at the conference.

The EERA Secretariat welcoming participants at the entrance.

Entrance area with EERA's conference banner.

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