

# Conclusions

The 4<sup>th</sup> Smart Grid PCI Summit convened a diverse group of experts from the smart grid community, including European operators, regulators, energy organisations, institutions, and technology vendors. The discussions were wide-ranging and insightful, focusing on the present challenges and current and future directions of smart grid development.

## **Key challenges were identified:**

- Complexities from shifting towards decentralised systems with the integration of renewable energy sources and new participants in the system.
- Increasing vulnerabilities due to extreme weather events, as well as cyber and physical threats.
- Potential bottlenecks from supply chain disruptions and permitting delays.
- Ageing electrical infrastructure.

## **Despite all these challenges, solutions driven by a shared vision were articulated by the participants:**

- Europe is embarking on an energy transition towards a decarbonised, fully independent, and efficient energy system.
- This transition aims to provide fair, competitive energy prices across Europe.
- However, no energy transition can occur without a smart, integrated, and resilient European energy system, where electrification will play a key role.

## **To accomplish this vision, the speakers acknowledged that modernising the European electricity infrastructure is crucial, by both digital and physical means:**

- Strong investments in the grid are essential, supported by effective planning and streamlined permitting processes.
- Anticipatory investments, supported by aligned financial frameworks, are also crucial for accommodating fast-growing demand and the rapid development of renewable energy sources.
- Regulatory frameworks must evolve to support the integration of flexibility and innovation in grid infrastructure.
- Traditional regulatory models need to evolve to frameworks that incentivise investments in modern and flexible systems.

- Coordinated regulatory and financial efforts are necessary to ensure that the investments materialise.
- Digitalisation and smart technologies should be the means but not the end. They should be enablers driven by data collection and analysis, enabling them to enhance operational efficiency, inform decision-making, and establish strategic priorities.

**It was agreed that cooperation among the various stakeholders involved in the electrical grid is paramount to achieve the goal of a resilient and interconnected European energy system.**

- Programs such as CEF and Horizon serve as catalysts, reducing fragmentation and facilitating the knowledge transfer and replication of good practices, as well as enhancing technologies.
- AI, which is here to stay, was discussed as a specific example. Cooperation is essential for the rapid development of models that will enable Europe to achieve sovereignty and independence.
- However, the discussed technological challenges require that humans remain in the loop, with close monitoring of associated risks.

These discussions are not to be concluded here, but rather continued in future forums, such as the Energy PCI Days in Brussels in December 2025 and next year's Smart Grid PCI Summit in Slovakia.

