11th Annual IEA-EPRI Challenges in Electricity Decarbonisation Workshop

17 and 18 September 2024

Room 1 (first floor)
9 Rue de la Fédération, 75015, Paris

International Energy Agency

Background

Electricity currently accounts for just over one-fifth of final energy consumption. With energy and climate strategies increasingly prioritizing electrification, the share of electricity in end-use is expected to double by 2050 to meet international climate commitments. As a result, electricity security will become even more critical to modern societies.

Power systems are undergoing significant transformation to support the expanding role of electricity, reduce reliance on imported fuels, and integrate more variable renewable resources and storage across larger interconnections. This shift is further enabled by digitalization, which promotes decentralization and greater consumer engagement. However, electricity infrastructure faces challenges from development barriers, geopolitical tensions, and climate-related threats. These issues necessitate a rethinking of electricity security, addressing system adequacy and flexibility, dependencies, and coordination within the power sector and across other sectors, as well as resilience to cyber threats and extreme weather events.

Since 2014, the International Energy Agency (IEA) and the Electric Power Research Institute (EPRI) have co-hosted workshops bringing together experts, policymakers, and regulators to discuss key challenges in the power sector's transition.

The 11th IEA-EPRI Challenges in Electricity Decarbonisation workshop will follow the Electricity Security Advisory Board and will delve deeper into topics such as power market design, the impact of Artificial Intelligence, and the growing trend of resource decentralization. The final session will pay special attention to the role of decentralization in enhancing the resilience of Ukraine's electricity system.

Format

The meeting will be informal and conducted under the Chatham House Rule. Each session will be introduced by invited speakers, followed by a roundtable discussion. Attendance is by invitation only.

For more information, please contact: esab@iea.org.

Agenda

IEA-EPRI Challenges in Electricity Decarbonisation Workshop	
Day 1: Tuesday 17 September	
13h45-14h15	Welcome coffee and registration
14h15-14h30	**Welcome and Opening** *Tom Terbush, Director, EPRI International* **Reflections on the Electricity Security Advisory Board** *Pablo Hevia-Koch, Head of Unit, Renewables Integration and Secure Electricity, IEA*
14h30-15h55	**Session 1: Setting the Scene: Power Systems in Transitions** • *Lena Kitzing, Professor and Head of Division Wind Energy Systems, Technical University of Denmark (DTU)* • *Tom Terbush, Director, EPRI International* Followed by Roundtable discussion
15h55-16h15	Coffee Break
16h15-18h00	**Session 2: Market Designs for Secure Transitions** Power markets play a crucial role in ensuring electricity security, especially as power systems undergo transformation and decarbonization. To maintain reliability, markets must send effective signals and reward availability where it is most critical. This session will explore how markets are evolving to address these challenges. The discussion will focus on the strengths and weaknesses of current markets, the design features needed to enhance flexibility — including grids and energy storage deployment — and the development of new markets and capacity mechanisms to ensure a diverse and reliable energy supply. Moderator: *Mo Cloonan, Principal Project Manager, EPRI* Introductory interventions: • *Kelli Joseph, Senior Fellow, Electricity Market Design and Climate, University of Pennsylvania*

	• *Sarah Keay-Bright, Market Strategy Manager, National Grid Electricity System Operator, United Kingdom* • *Cillian O'Donoghue, Policy Director, Eurelectric* • *Devon Swezey, Senior Manager Global Energy and Climate, Google* • *Craig Glazer, Vice President Federal Government Policy, PJM Interconnection* Followed by Roundtable discussion
18h00	Reception

Day 2: Wednesday 18 September, 8h30-12h45

8h30-9h00	Welcome coffee
9h00-10h30	**Session 3: Secure electricity in the era of Artificial Intelligence** Artificial Intelligence (AI) is rapidly advancing digital transformation and bringing new opportunities to the power sector. As power systems become increasingly digitalized, the question arises: should the power sector fear or embrace AI? This session will examine the impact of AI on electricity security, exploring the growth of servers and their implications for grids, including the potential for demand-side response. The discussion will also address the importance of locational signals for new server deployment, the management of cybersecurity risks, and the role of AI in electricity systems management, considering the associated risks related to responsibility and decision-making. Moderator: *Wil Smith, Senior Advisor, Government and External Affairs, EPRI* Introductory interventions: • *(TBC) Thomas Spencer, Power Sector Modeller, IEA* • *David Carroll, Head of Future Power Markets, Eirgrid* • *(Speaker TBC), Microsoft*

	• *Gabriel Bareux, Director of Research, Réseau de Transport d'Electricité (RTE)* • *Arne Brufladt Svendsen, Chief Technology Officer, Infinigrid* Followed by Roundtable discussion
10h30-10h50	Coffee Break
10h50-12h30	**Session 4: Resilience of Decentralised Power Systems (Ukraine study case)** The aggregation of distributed energy resources, Virtual Power Plants (VPPs), and energy communities are emerging as key solutions for enhancing electricity security, affordability, and decarbonization. While pilot projects are increasing, their long-term success depends on properly valuing their contributions to the system and its participants. This session will examine the factors that enable the growth of energy communities, aggregators, and VPPs, and discuss how to engage consumers in the energy transition. It will also address how decentralization can strengthen system security, with a focus on Ukraine's energy security challenges. The insights gained from Ukraine's experience will be explored for their relevance to other power systems, particularly in enhancing resilience against internal and external threats. Moderator: *Talya Vatman, Russia, Caspian and Black Sea Programme Manager, IEA* Introductory interventions: • *Roman Grabchak, Head of Balance Reliability Department, Ukrenergo* • *(Speaker TBC) DTEK* • *Olga Khakova, Deputy Director for European Energy Security, Global Energy Centre at Atlantic Council* • *Ryan Hledik, Principal, The Brattle Group* • *Craig Hart, Energy Analyst, Renewable Integration and Secure Electricity, IEA* Followed by Roundtable discussion
12h30-12h45	Closing Remarks