

SESSION 4

Session on Growth of RE and EV; and the Plan for Enhancing Grid Flexibility

INTRODUCTION

The Indian energy landscape is undergoing a profound and transformative evolution, driven by the determination to achieve Net Zero by 2070. Central to this transformation being electrification of all plausible sectors. Two dynamic and interrelated trends that have garnered global attention - the unprecedented growth of renewable energy (RE) resources and the swift adoption of electric vehicles (EVs). These trends stand as the vanguards of India's energy future, heralding a departure from fossil fuel dependence towards cleaner and more efficient alternatives. This session served as a pivotal platform for examining these trends, assessing their impact, and formulating strategies to further their integration with the national grid.

PARTICIPANTS

Alok Tandon, Chairperson, JERC (Chair); Ravi Seethapathy, ISGF WG Chair and GSEF Ambassador for Americas (Moderator); Killian McKenna, NREL, USA; Zakir Rather, Associate Professor, IIT MUMBAI; Hans Peter Waldl, Managing Director, Overspeed GmbH, Germany; Sharvari Patki, Program Head, Electric Mobility, WRI India; Sainath Bandhakavi, Principal Solutions Architect - Power & Utilities, Sustainability, Amazon Web Services (AWS); Vishal Kumar, BU Manager-IMA, Phoenix Contact; Nilesh Kane, Chief-Mumbai Distribution, Tata Power Company Ltd; and Narayankumar Sreekumar, Associate Director - Electric Mobility Program, Shakti Sustainable Energy Foundation.

KEY TAKEAWAYS

- The session discussed India's significant growth in renewable energy, particularly solar power, and the increasing adoption of electric vehicles. Government initiatives like the FAME scheme and the National Electric Bus Program were mentioned as key drivers. The session also touched upon the challenges and forecasts related to EV adoption and the importance of developing standards for inverter-based resources for grid stability.
- Grid Flexibility and Integration Challenges: Speakers discussed the need for enhancing grid flexibility to accommodate the growing share of intermittent RE resources and the fast-increasing power demand for EV charging.
- The importance of proper communication protocols and connectivity for integrating renewable energy resources with the grid was emphasized, along with the potential of various aggregator models and vehicle-to-grid (V2G) applications.

- Grid flexibility is key to renewables integration, resiliency, and disaster recovery. “Load-following-RE Generation” attributes becomes vital in the emerging power systems with larger share of intermittent RE resources; and feature of asynchronous islanding and reconnection back to grid will be a beneficial feature.
- “Control Architectures” could include a home, a building, a campus or a utility service area; and segregating interruptible and non-interruptible loads enables better response.
- Important to have efficient systems for quick capture of RE surpluses when it occurs and then release to loads when needed
- Technical and Regulatory Aspects: The session deliberated on the technical and regulatory requirements for the adoption of V2G technologies, including the need for technical regulations alongside commercial ones. The discussion also highlighted the importance of cybersecurity in the energy sector and the specific guidelines provided by standards like IEC 62443.
- Innovative Solutions and Future Directions: Speakers presented innovative solutions and projects, such as using electric buses as energy storage systems and peer-to-peer (P2P) energy trading. The role of utilities in adapting to changing consumer demands and the potential of distributed energy resources like rooftop solar PV were also discussed. The session concluded with insights from the experts, emphasizing the need for a collaborative approach to address the challenges in integrating RE and EVs into the grid.

