Session 1: How the Electric Grid and Energy Markets Function and the Key Drivers for Change

**How the Electricity Industry Works: Understanding Regulated and Restructured Markets**
- Vertically integrated utilities.
- Competitive markets and how they work.
  - Products & prices (capacity, grid balancing services, energy).
  - General cost structures.
  - Regulatory bodies and responsibilities.

**Electric Generation Assets**
- Operating characteristics
  - Nuclear.
  - Coal.
  - Gas.
  - Wind.
  - Solar.
  - Other resources.
- Capital vs. operating costs and levelized costs of energy.
- Understanding the dispatch resource stack.

Session 2: Challenges of Decarbonizing Energy: Growing Grid, Changing Supply/Demand Mix, Integrating Renewables, and Energy Storage

**Critical Issues Related to Beneficial Electrification and the Growth of the Grid**
- Drivers for increased electricity consumption.
  - Heat pumps.
  - Electric vehicles.
  - Hydrogen.
- Potential impacts on the future grid.
- Addressing uncertainties in energy planning, especially with recent federal subsidy programs.

**The Challenge of Decarbonization and the Evolution of the Generation Fleet**
- The impact of fracking on power markets and prices.
- Challenges of integrating renewables: Managing variability and negative co-variance of renewable resources.
- The growing role for energy storage, both short- and long-duration.
- The increasing role of distributed generation resources (DERs) and how they can aid in decarbonization strategies.

The Growing Tension Between Centralized and Distributed Resources
- The increasing role of distributed generation resources (continued).
  - Examples and business models pointing the way forward.
  - Distributed solar and the critical issue of net metering.
  - Coordination challenges and architectures.
  - Challenges related to the “electrification of everything”.

A Possible Roadmap for the Evolution of the Grid
- Where we stand today.
- Where we may be by mid-decade.
- 2030 and beyond: going the last mile to a cleaner grid.
  - Hydrogen.
  - Small modular nuclear.
  - Fusion.

Upcoming Live Virtual Events:
- March 26-28, 2024 - Distributed Energy Resource Fundamentals — In this training, make the case for DERs and look at qualifying resources that governs BER behavior and compensations while maximizing the benefits of DERs.
- May 21-23, 2024 - Energy Storage Fundamentals — In this training, we look at the big picture of energy storage to date and its growing role on the grid today while examining utility portfolio planning and future considerations of the regulatory framework.

- July 16-18, 2024 - Electrification of Transportation Fundamentals — In this training, we discuss the inherent advantages and promotion of EVs for policymakers and utilities and looking at increased consumption and networks and the emerging business models.
- October 22-24, 2024 - Hydrogen Basics — In this training, we look at long-term storage and the current applications as well as diving into green hydrogen and use cases and proposed projects.

Questions?
Contact learning@sepapower.org