3-Part Course | 7 Hours
July 11, 12, and 13, 2023 from 2:00 - 4:30 PM Eastern
On-Demand Available July 27, 2023

Session 1: The Big Picture—Energy Storage to Date, Applications, and Its Growing Role on the Grid Today

- Key challenges and aspects of the power grid—how it works, markets, keys to grid stability.
- Renewable energy—growth in wind and solar and production profiles.
- Storage processes, technologies, and applications across the energy industry.
- Types of energy storage, advantages and disadvantages.
  - Pumped storage.
  - Compressed air energy.
  - Hydrogen.
  - Elevated rail.
  - Elevated weight.
  - Flywheels.
  - Liquid air.
  - Thermal (ice and hot rock).
  - Advanced lead acid.
  - Flow batteries.
  - Hydrogen.
  - Lithium ion batteries (multiple chemistries).
- Trends and shifts in today’s electricity markets—drivers of change.
- Battery storage technologies—cost and performance.
  - Technical fundamentals—how each chemical storage technology works.
  - Understanding their potentials, limitations, and promising applications.
  - Lithium ion supply chain dynamics.
  - The impact of electric vehicles (EVs).
  - Balance of system costs.
  - The role of storage-related software.
  - Market dynamics and competitive positioning—why lithium ion is winning.
Session 2: Valuing Storage as a Resource in Utility Portfolio Planning

- Determining optimal levels and values for storage applications as the grid evolves and why the need for storage will increase.
- Power system planning requirements for achieving successful integration of energy storage.
- Megawatt hours (MWh) vs. megawatts (MW)—optimal energy to capacity ratios.
- Best planning practices for grid operations and utilities.
- Safety concerns and best practices.

- Benefits of energy storage, applications, and use cases.
  - Grid reliability—frequency regulation, peak management.
  - Infrastructure enhancement.
  - Utility-scale renewables firming and enhancement.
  - Gas peaker replacements and hybrid fossil generation.
  - Distribution infrastructure enhancement/replacement and resilience projects.
  - Aggregated on-site virtual power plant.
  - Customer cost mitigation: solar self-storage, time-of-use and demand charge management.
  - Microgrids.
  - Managed EV charging.

Session 3: Storage, Policy, Future Considerations—the Regulatory Framework and Rate Structures

- Understanding the policy landscape relevant to storage at the federal level.
  - Investment tax credit (ITC) tied to solar projects.
  - FERC Order 841 and integration of storage into wholesale energy markets.
- State, province, and local policy drivers.
  - The growing need for coordination among various parties.
  - California’s 12 clarifying rules of implementation/dischage.
  - State-specific storage initiatives and mandates, including utility grid modernization proceedings and NYREV.
- End-of-life disposition.
  - Charging life cycles for main lithium battery chemistries.
  - Repurposing and recycling EV batteries.

- Battery storage heading into the future: chemistries and applications.
  - Future technological development.
  - Ongoing energy market disruptions and projections for future storage deployments.
  - Optimizing storage as a resource in the short- and long-term.
- Cybersecurity concerns and batteries as an asset or a threat to the power.