

Renewables and Wholesale Electricity Markets

August 31 - September 1, 2021 | Digital Access

August 31, 2021

8:20-8:40 am PT Introduction and Opening Remarks

Day one will provide a high-level view of U.S. power markets, and take a deep dive into some of seismic policy, technology and market factors that are driving opportunities to develop profitable renewable energy projects. The aim is to identify how major trends such as growth of solar, deployment of storage, and the enormous coming wave of offshore wind will affect price formation, interconnection, asymmetric risks and dispatch.

8:40-9:20 am **Session 1: Understanding the Key Distinctions Between U.S. Wholesale Power Markets**

This session will provide insights into the activities and major trends within the various U.S. power markets, pointing out the key differences and key distinctions between them from the perspective of those looking to develop or trade renewable energy in these regions.

- Total trading picture: activity, how much traded now vs years ago, how much generation built, etc.
- Origins and evolution of structured markets
- Current status
- Why some are still utility dominated (bi-lateral) vs competitive
- Strategies for extracting value from a centralized market

Lee Van Atta, *Vice President, Energy & Infrastructure Consulting*, LEIDOS

9:20-9:35 am *Live Q&A*

9:35-9:45 am *Break*

9:45-10:15 am **Session 2: Regulatory and Policy Issues Affecting Renewable Participation in Wholesale Power Markets**

This session will provide a brief update on the key regulatory and market policy issues that are creating uncertainty and potential opportunities to extract value in markets going forward. It will look at current trends at the federal, regional and state levels and their potential impacts, and how that can affect thinking going forward.

- Potential impacts of the American Job Plan and other Biden Administration initiatives

- FERC and State Policy Initiatives – what ongoing?
- Federal and State Carbon Actions
- RPS and REC markets

Molli Gerken, P.E., *Environmental Engineer, Commercial Energy Solutions, LEIDOS*
Lee Van Atta, *Vice President, Energy & Infrastructure Consulting, LEIDOS*

10:15-10:30 am

Live Q&A

10:30-10:40 am

Break

10:40 – 11:25 am

Session 3: Solar’s Impacts on Wholesale Power Markets...And Vice Versa

As solar penetration accelerates its impacts on wholesale markets and pricing increase, introducing challenges and risks both to the owners of existing generation and those looking to deploy more. This session will examine how these impacts are playing out, and explore how the vagaries of wholesale markets impacts renewable asset earnings.

- Assessing the issues affecting the growth of solar projects: technology, challenges and state of the development market
 - Transmission constraint/basis risks
 - Volatility
 - Variability around output
- Discussion: How power markets could be affected by increased dependence on solar
 - Impact of high penetration of solar on power pricing
 - Risks and challenges, shape risk and hedges
 - Financial settlements and asset production risk during periods of high energy pricing

Michael Giampetro, *Vice President – Conventional and Emerging Technologies, Energy & Infrastructure Consulting, LEIDOS*

Lee Van Atta, *Vice President, Energy & Infrastructure Consulting, LEIDOS*

11:25 – 11:40 am

Live Q&A

11:40 – 12:10 pm

Lunch

12:10 pm – 1:20 pm

Session 4: Battery Energy Storage: Interactions with and Impacts on U.S. Power Markets

Storage is proving to be a game-changer in many markets. As the generation mix increasingly shifts to renewables and decarbonization goals expand, storage is increasingly being deployed both as an adjunct to solar projects and as standalone systems. This session will discuss the potential roles, impacts and monetization strategies for energy storage systems, including:

- Long, medium and short duration storage: how market characteristics and policies affect their use and profitability

- What products can they offer?
- Where is the energy storage sector trending for BESS duration? What is driving this trend?
- Roles (Use Cases) for batteries in wholesale markets
- Regulation: what it is, and what drives its pricing?
- Modeling of batteries in wholesale markets
- Discussion: Impacts of battery storage on markets in areas with high penetration of wind and solar
 - How they affect wholesale pricing
 - How do you value the battery operating in hybrid projects?
 - What are some advantages of solar PV either AC or DC coupled with storage?
 - Issues with maintaining firm capacity value

Mark Hardin, *Senior Consultant – Battery Energy Storage Expert, Energy & Infrastructure Consulting, LEIDOS*

Lee Van Atta, *Vice President, Energy & Infrastructure Consulting, LEIDOS*

1:20 – 1:35 pm

Live Q&A

1:35 – 1:45 pm

Break

1:45 – 2:35 pm

Session 5: The Coming Vast Buildout of Offshore Wind: Integration Challenges and Impacts on Wholesale Power Markets

A vast buildout of offshore wind is expected off the Eastern seaboard in the near-term, while floating deep water projects off the Pacific Coast are anticipated in the longer term. Interconnecting these projects could be challenging in many markets, while their impacts on power pricing could be substantial. This session will explore the potential challenges and impacts on power markets.

- Assessing when, where and how much OSW is coming:
 - Overview of current projects and future development zones
 - State plans and initiatives
 - Project timelines and challenges
- Identifying the challenges of introducing OSW in markets:
 - Integration planning in NYISO, ISO-NE, PJM
 - Project timelines and challenges
 - Impacts of market rules and operations on OSW projects
- Discussion: how the introduction of OSW assets is likely to affect markets
 - How will the deployment of OSW effect price formation?
 - Will there be impacts on reliability?

Brian Armstrong, *Managing Director, Energy & Infrastructure Consulting, LEIDOS*

Christian H. Carpenter, *Vice President, Energy & Infrastructure Consulting, LEIDOS*

2:35 – 2:50 pm *Live Q&A*

2:50 – 3:50 pm *Virtual Networking*

September 1, 2021

Day two will provide insights and assessments of how best to extract value out of renewables in various regional markets. Each session will provide an introduction to the market structures utilized in each RTO/ISO, and the key issues being faced by developers in each. The session will then delve into the fundamentals in play such as capacity mix, dispatch stack and changes to market rules in each, and their impacts on capacity additions, profitability of market niches and long-term revenue streams. Finally, the individual factors that can contribute to the forming successful strategies to extract value will be identified.

8:30-9:30 am PT **Session 6: Assessment of the ERCOT Market—Policy Shifts, Risks and Pricing Post-February Crisis**

ERCOT was shaken to its roots by the extended outages and price spikes in February of 2021. Despite extended pricing at the maximum \$9000 per MWh, it proved impossible to maintain enough supply, nearly leading to a total blackout. These events resulted in significant economic winners and losers in the ERCOT market, a changeover in ERCOT and PUCT leadership, and the potential for significant policy changes. ERCOT was already a hotbed of development of large amounts of wind, solar and storage...will this be affected? This session will explore the potential short and long-term prospects for the nation's only structured wholesale power market without a capacity market.

- Recap of February's events
- What is happening as regulatory process unfolds
- Will the asymmetric risks brought to light change project structure, risk management and contracting strategies?
- Will there be more focus on merchant power in ERCOT?
- Outlook for renewable growth and value

John Higgins, *Director, Energy & Infrastructure Consulting, LEIDOS*

9:30-9:45 am *Live Q&A*

9:45-9:50 am *Break*

9:50-10:50 am **Session 7: Spotlight on the Emerging Opportunities and Risks for Renewables in the "Merchant" Eastern U.S. Markets (PJM, NYISO, ISO-NE)**

Development queues in PJM, NYISO, and ISO-NE are shifting sharply to renewable projects and energy storage. All three markets have huge offshore wind potential while at the same time expecting growth in solar. Can the traditional "merchant" power markets continue to support and integrate increasing quantities of renewables? How will state policy objectives for renewables be reconciled with FERC views of subsidies and the impact on administered capacity markets?

- Capacity Market Design and Capacity Auction Process
- Policy Developments
- Outlook for Renewable Growth and Value

John Higgins, *Director, Energy & Infrastructure Consulting*, LEIDOS

10:50-11:05 am

Live Q&A

11:05 -11:40 am

Lunch

11:40 am-12:40 pm

Session 8: Renewables and the Western U.S. Markets—Assessing Opportunities and Challenges to Meet Low-Carbon Policy Goals

California and other western states are moving aggressively to a low carbon future. Can the current market structures in CAISO and the non-ISO WECC support a reliable grid as they become ever more dependent on carbon-free energy sources? What market changes may be needed to support state renewable policy objectives, and how would those effect renewables? How will the duck curve evolve as solar penetration and battery additions continue in CA?

- Resource Adequacy and Reliability
- Policy Developments
- Outlook for Renewable Growth and Value

Lee Van Atta, *Vice President, Energy & Infrastructure Consulting*, LEIDOS

12:40 – 12:55 pm

Live Q&A

12:55 -1:00 pm

Break

1:00 pm -1:35 pm

Session 9: Assessing the Opportunities for Wind, Solar and Storage in the Central U.S. Markets (MISO and SPP)

MISO and SPP have some of the best wind resources in the U.S. and wind penetration is already very high during certain times of the year. How much additional wind can be supported in these regions and where are opportunities best for solar and energy storage in these markets?

- Co-existence of bilateral capacity market and voluntary auctions
- Policy Developments
- Outlook for Renewable Growth and Value

Dr. Amrita Bhattacharyya, *Associate Director, Energy & Infrastructure Consulting*, LEIDOS

1:35-1:50 pm

Live Q&A

1:50-1:55 pm

Break

1:55-2:35 pm

Session 10: Prospects for Renewables in the Southeast Markets (SEEM, SERC, TVA, Florida)

The power markets in the Southeast US. are primarily bi-lateral in nature and heavily dominated by the major utilities in each region. However, that might change to some degree, as several utilities recently filed plans for a Southeast Energy Exchange Market (SEEM) with FERC, though it is not certain that plan will be approved as filed. Where can renewable developers find opportunities in these regions? How will utility avoided cost regulation evolve and what are the implications for off-take contracts?

- Overview of the SEEM proposal
- Price Formation
- Capacity Value and Reliability
- Policy Developments
- Outlook for Renewable Growth and Value

Dr. Amrita Bhattacharyya, *Associate Director, Energy & Infrastructure Consulting, LEIDOS*

2:35-2:50 pm

Live Q&A

2:50-3:00 pm

Break

3:00-4:00 pm

Session 11: Office Hours: Interactive Live Zoom Session

This Interactive Live Zoom Session at the class conclusion allows you to get your most pressing questions answered, and to interact with Master Class Instructors in real time.

Lee Van Atta, *Vice President, Energy & Infrastructure Consulting, LEIDOS*

Dr. Amrita Bhattacharyya, *Associate Director, Energy & Infrastructure Consulting, LEIDOS*

John Higgins, *Director, Energy & Infrastructure Consulting, LEIDOS*

Michael Giampetro, *Vice President – Conventional and Emerging Technologies, Energy & Infrastructure Consulting, LEIDOS*

4:00 pm

Master Class adjourns