OPTIMIZING THE RENEWABLE INTERCONNECTION PROCESS:
Addressing Process and Technical Issues for Renewable Energy and Storage Projects

January 18-19, 2017
Sheraton New Orleans Hotel
New Orleans, LA

POST-CONFERENCE WORKSHOP

Interconnection Guidelines, Standards & Requirements Update

THURSDAY, JANUARY 19, 2017
OVERVIEW

For the first time in 13 years, the Federal Energy Regulatory Commission (FERC) has proposed reforms to its large generator interconnection processes, to try to improve the efficiency of interconnection requests and remove barriers to development. Connecting utility-scale renewable energy and battery storage projects to the grid is a complex procedure governed by state and federal regulatory processes that specify technical, financial, and timing requirements. For utilities and grid operators charged with facilitating new projects onto the grid in a reliable manner, it is necessary to adhere to regional and federal regulations, engage in effective queue procedures, and comprehensively study the impact of the project on the larger grid and system. For renewable resource developers, transmission interconnection is a key challenge for successful project development, and often drives the economic viability of a new renewable project.

This conference will serve as a forum for utility and power technology experts to share their expertise and discuss best practices for optimizing the interconnection process. It will discuss FERC’s recent Notice of Proposed Rulemaking (NOPR) to improve the interconnection process, the RTO/ISO interconnection process in various regions across North America, technical requirements of the interconnection process from start to finish, the impact of FERC rules, and more. The particular application focus for this program will be large-scale wind, solar, and energy storage projects. Panel sessions will feature the perspectives of distribution, interconnection customers, developers, ISOs/RTOs, transmission owners, and utilities.

LEARNING OUTCOMES

• Review the history and background of the renewable interconnection process
• Identify the latest regulatory changes and rulemakings in process on the state and FERC level
• Examine key regulatory and policy challenges impacting renewable and storage interconnection
• Identify methods for estimating interconnection costs and considerations for keeping costs down
• Discuss cost allocation options among parties collaborating on new builds
• Discuss how to identify and evaluate potential sites for development of renewables based on interconnection needs
• Review the interconnection process from the perspective and experiences of:
  a. Investor-owned utilities in regulated and retail markets
  b. Renewable and storage project developers
  c. Independent System Operators (ISOs), Regional Transmission Organizations (RTOs), and Power Marketing Administrations (PMAs)
• Evaluate interconnection case studies across regional jurisdictions and project requirements for generator interconnection for specific RTOs, ISOs, and PMAs:
  a. Midcontinent Independent System Operator (MISO)
  b. PJM Interconnection LLC
  c. ISO New England (ISO-NE)
  d. New York Independent System Operator (NYISO)
  e. Bonneville Power Administration (BPA)
  f. Electric Reliability Council of Texas (ERCOT)
  g. Southwest Power Pool (SPP)
  h. Western Electricity Coordinating Council (WECC)
  i. SERC Reliability Corporation (SERC)
• Examine inefficiencies and outdated policies creating challenges in the interconnection process
• Discuss opportunities to address inefficiencies and optimize the interconnection process for all entities involved
AGENDA

WEDNESDAY, JANUARY 18, 2017

7:30 – 8:00 am  Registration and Continental Breakfast

I. Introduction to the Interconnection Process and Associated Challenges

8:00 – 9:00 am  Introduction to Renewable Interconnection: A Brief History and Overview of Current Challenges

• How did we get where we are today with the interconnection process and rules?
• Background/history of FERC standard interconnection agreements and procedures for generators
  o FERC Order 2003
  o FERC Order 2006
• Current status of FERC generator interconnection requirements
• The role of state rules and procedures for interconnection
• General process for interconnection requests
• Challenges to renewable and energy storage interconnection
• Queue Reforms- attempts to speed up queue processing and increase certainty regarding the cost of interconnection
  o Changing from first-come/first-served to first-ready/first-served processing
  o Redefining actions triggering Material Modifications
  o Use of Cluster Studies instead of individual serial studies
  o More equitably allocating the cost of common network upgrades
  o Developing fast-track process for very small projects
• What does meaningful queue reform look like?
• Notable regional queue reforms and new attempts
  
  Steven Garwood, Principal and Senior Consultant, PowerGrid Strategies LLC

9:00 – 9:45 am   Potential Regulatory and Policy Directions for Renewable and Storage Interconnection

Many of the grid rules governing how to plan for, interconnect, and operate power on the grid are believed to be inefficient and outdated, especially with regard to interconnection processes for renewable and battery storage resources. The overarching federal laws governing interstate transmission has been in place since the 1930s – well before solar and wind generation became available in significant amounts, both resources that are variable and fluctuate up and down based on factors like weather and time of day. This session will discuss regulatory and policy considerations for enabling a more optimal interconnection process that would better accommodate wind, solar, and battery storage resources on the grid. It will describe some of the efforts supported by The Sustainable FERC Project, an organization working to expand the deployment of clean energy resources into America’s electricity transmission grid. The Sustainable FERC Project is most active in the FERC-regulated grid organizations in the country.

  Jennifer Chen, Attorney, Sustainable FERC Project

9:45 – 10:00 am  Morning Break

10:00 – 11:00 am Estimating Interconnection Costs and Revenues

Interconnecting new renewable power plants and storage projects involves navigating the many rules and regulations of the given grid region, and assessing potential pricing impacts for different sites to try and evaluate the most economically advantageous area. This session will address the economics of project interconnection from a cost analysis perspective, discussing:

• Economic and pricing impacts of project interconnection based on site
• Hurdles and risks that can negatively impact prices
• Capacity performance and capacity revenues

  Bill Babcock, Consultant, PA Consulting
  Jonathon Abebe, Manager — Engineering and Transmission, Clean Line Energy
II. Regional Interconnection Requirements: RTO’s/ISO’s/PMAs

11:00 – 11:45 am MISO Interconnection Project Requirements
This session will discuss the process and requirements for generator interconnection in the Midcontinent Independent System Operator (MISO), a RTO operating in the Midwest and south United States, and in Manitoba Canada. It will describe the interconnection process from start to finish as well as key considerations for participating in MISO’s queue. Specifically, the session will evaluate:
• Queue policies, procedures, deadlines and requirements
• Considerations for site location and available points of interconnection
• Making requests and applying for interconnection
• Required and optional studies and analyses
• Interconnection agreements for a generator
Tim Aliff, Director- Reliability Planning, Resource Interconnection and Planning, MISO

11:45 am – 12:45 pm Group Luncheon

12:45 – 1:30 pm PJM Interconnection Project Requirements and Process
This session will discuss the process and requirements for generator and storage interconnection in the PJM Interconnection LLC, an RTO that is part of the Eastern Interconnection grid in the United States. The session will describe PJM’s current process and reasons it is done this specific way. It will also describe possible updates to the PJM’s interconnection process that FERC and stakeholders are reviewing, including the possibility of a future co-siting and interconnecting process for connected renewable and storage projects. Specifically, the session will describe:
• Queue policies, procedures, deadlines and requirements
• Considerations for site location and available points of interconnection
• Making requests and applying for interconnection
• Required and optional studies and analyses
• Interconnection agreements for a generator
David Egan, Manager, Interconnection Projects, PJM Interconnection

1:30 – 2:15 pm Northeast Interconnection Challenges: ISO-NE and NYISO
This session will focus on interconnection processes in the northeast, describing challenges currently being experienced by the ISO New England (ISO-NE) and New York Independent System Operator (NYISO). The session will identify inefficiencies in the interconnection process and describe how they create larger problems, with regard to the scheduling of project development in the region and meeting state and regional renewable policy goals. Along these lines, the session will evaluate:
• General challenges for interconnecting with facilities
• Considerations for interconnection costs based on site location
• Current areas of congestion in the northeast and challenges moving power to where it is actually needed
• How best to address needs for costly infrastructure upgrades
• Considerations for a more efficient queue process to meet renewable and policy goals
Paul Hibbard, Vice President, Analysis Group
WEDNESDAY, JANUARY 18, 2017 (CONTINUED)

2:15 – 3:00 pm  Requirements for Interconnection to BPA Transmission Grid
The Bonneville Power Administration (BPA) is a federal agency and designated marketing agent for power from all federally owned hydroelectric projects in the Pacific Northwest. Requests to interconnect generating resources or loads (projects) in BPA’s territory are typically submitted by the project developer, but may be made in conjunction with a utility located within BPA’s Balancing Authority Area. This session will provide an overview of requirements and considerations for interconnecting to the BPA transmission grid, discussing:
- Interconnection requests and other important information for new customers
- Technical and operations requirements for generation interconnection
- Applicable codes, standards, criteria and regulations
- Studies and cost estimates
  - Cost assignments for generation or line/load interconnections
  - Evaluation and study of project impact to transmission facilities and affected systems

Cherilyn Randall, Customer Service Engineering, Bonneville Power Administration (BPA)

3:00 – 3:15 pm  Afternoon Break

III. Project Developer Perspective

3:15 – 4:30 pm  Developer Perspective: Lessons Learned on Interconnection Across the United States
This session will describe lessons learned and experiences with the interconnection process from the perspective of Renewable Energy Systems (RES) Americas, an international renewable project developer. The session will generally describe a renewable developer’s process for interconnecting renewable and storage projects, and then discuss specific projects RES has developed and interconnected in jurisdictions across the country. The session will describe interconnection case studies in regulated environments, as well as in the grid-operated regions of MISO, PJM, NYISO, ERCOT, SPP, and WECC.
- Ravi Bantu, Senior Transmission Strategist, Americas, RES Americas
- Jesse Boyd, Transmission Analyst, RES Americas

IV. Storage Interconnection

4:30 – 5:15 pm  Panel: Improving the Process for Energy Storage Interconnection
Energy storage resources are a unique asset class that does not fall under traditional ‘generation’ or ‘load’ categories. They have the ability to be controllable, mitigate grid congestion, and integrate renewable generation. However, some believe existing interconnection rules, studies and processes do not entirely capture capabilities and benefits of electric storage resources. This session will evaluate:
- Systematic benefits of energy storage deployment on the electric grid
- Economic benefits of energy storage with renewable generation on the electric grid
- Where existing interconnection rules, studies and processes can be improved to facilitate the interconnection of electric storage resources
- Work FERC has done to facilitate storage interconnection

Moderator: Steve McKenergy, Vice President – Storage Solutions, 8minuteenergy
- Jennifer Chen, Attorney, Sustainable FERC Project
- David Egan, Manager – Interconnection Projects, PJM Interconnection
- Laura Hatfield, Contract Manager, Transmission Policy & Contracts, Puget Sound Energy (PSE)
- Chris Loeb, Consultant Analyst - Global Energy and Utilities, PA Consulting

5:15 – 6:15 pm  Networking Reception
THURSDAY, JANUARY 19, 2017

7:30 – 8:00 am  Continental Breakfast

V. Investor-Owned Utility (IOU) Interconnection Practices

8:00 – 8:45 am  Xcel Energy: Managing Wind Projects in the Interconnection Queue
Randall Oye, Transmission Access Analyst, Xcel Energy

8:45 – 9:15 am  Puget Sound Energy: Open Access Transmission Tariff (OATT) Scheduling Challenges
Laura Hatfield, Contract Manager, Transmission Policy & Contracts, Puget Sound Energy (PSE)

9:15 – 9:45 am  Southern Company: Considerations for System Impact Studies
Howard Smith, Manager – Distributed Energy Resources Policy, Southern Company

9:45 – 10:00 am  Morning Break

10:00 – 10:30 am  PEPCO Holdings: Managing Relationships in the Interconnection Process
Scott Razze, Interconnection Manager, PEPCO Holdings (invited)

VI. Optimizing the Interconnection Process

10:30 – 11:45 am  Closing Panel Session: Optimizing the Interconnection Process
• Addressing problems and inefficiencies in the interconnection process
• Removing barriers to renewable energy resource integration
• Grid design and operational improvements for more efficient penetration of renewable energy
• Smarter ways to provide grid connections for renewable and storage project developers
• Regulatory and policy updates that would better enable clean energy integration
• New technologies to help integrate renewables
• Debating FERC’s generator interconnection policy: is it conducive to efficient generation development?
• Changes and updates to current practices that would enable:
  o schedule certainty
  o cost certainty
  o considerations for overall system reliability planning
Moderator: Paul Hibbard, Vice President, Analysis Group
Tim Aliff, Director – Reliability Planning, Resource Interconnection and Planning, MISO
Randall Oye, Transmission Access Analyst, Xcel Energy
Howard Smith, Manager – Distributed Energy Resources Policy, Southern Company
Jonathon Abebe, Manager – Engineering and Transmission, Clean Line Energy
Cherilyn Randall, Customer Service Engineering, Bonneville Power Administration (BPA)

11:45 am  Conference Adjourns
POST-CONFERENCE WORKSHOP
Interconnection Guidelines, Standards & Requirements Update
THURSDAY, JANUARY 19, 2017

12:30 – 1:00 pm  Registration
1:00 – 4:00 pm  Workshop Timing

OVERVIEW
Interconnection standards dictate the technical, legal, and procedural requirements by which customers and utilities must follow for interconnecting new generation to the electric grid. These requirements are necessary to ensure safe, secure and economic proper functioning of the electric system. Interconnection requirements vary by region, as determined by the regional authority responsible for system integrity and the transmission company’s requirements.

This workshop will provide an introduction to important aspects of interconnection standards and requirements applicable to renewable generation and energy storage projects.

LEARNING OUTCOMES
- Assess industry standards and codes relevant to large-scale and distributed energy renewable generation
- Analyze utility and developer specific requirements for interconnection
- Identify overlap, synthesis, and fragmentation among various codes, standards and orders
- Review changes being considered to various codes and standards for interconnection
- Distinguish FERC orders from industry codes and standards
- Evaluate criteria and policy framework for effective interconnection practices

AGENDA
- History and Background
  - General control and interconnection issues
- Relevant Interconnection Standards and Rules
  - General standards
  - Distribution systems standards
  - Transmission system requirements
- Importance of Federal and State Rules and Procedures
- FERC Generator Interconnection Agreements and Procedures
  - Requirements for FERC large generation interconnection agreements (LGIA) and large generator interconnection procedures (LGIP)
  - Requirements for FERC small generation interconnection agreements (SGIA) and small generator interconnection procedures (SGIP)
- Changes and Updates Under Consideration
  - Updates on IEEE 1547, UL 1741, UL 62109-1 and NEC® Article 691 approved for 2017 code
  - Should Planning Conform to Present or Future (Progressive but Unratified) Standards and Requirements?
INSTRUCTOR

Steven Garwood
Principal and Senior Consultant, Powergrid Strategies LLC

Steven Garwood has extensive experience working in the electric utility industry spanning a period in excess of 27 years. Over a period of approximately 16-years, he has worked for multiple electric utilities in a variety of capacities including but not limited to executive management positions providing expertise in engineering, transmission operations, cost of service and utility ratemaking, as well as merger / acquisition support, serving as an expert witness and providing other litigation support. Mr. Garwood is the President of PowerGrid Strategies LLC, and assists numerous clients including electric utilities, independent generation and transmission developers, energy marketing firms, regulatory agencies and others engaged in the energy industry, advising them on a variety of matters including regulatory issues, rates and tariffs, transmission and market structures, NERC compliance issues and generator interconnection issues with a concentration of wind generation interconnection issues.
INSTRUCTIONAL METHODS

PowerPoint presentations, interactive dialogue and instructor/panel discussions will be used to present the material.

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for the entirety of the conference to be eligible for continuing education credit.

IACET CREDITS

EUCI has been accredited as an Authorized Provider by the International Association for Continuing Education and Training (IACET). In obtaining this accreditation, EUCI has demonstrated that it complies with the ANSI/IACET Standard which is recognized internationally as a standard of good practice. As a result of their Authorized Provider status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standard.

EUCI is authorized by IACET to offer 1.0 CEUs for the conference and 0.3 CEUs for workshop

EVENT LOCATION

A room block has been reserved at the Sheraton New Orleans Hotel, 500 Canal St., New Orleans, LA 70130 for the nights of January 17-18, 2017. Room rates are US $179 plus applicable tax. Call 504-525-2500 for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is January 4, 2017, but as there are a limited number of rooms available at this rate, the room block may close sooner. Please make your reservations early.

REGISTER 3, SEND THE 4TH FREE

Any organization wishing to send multiple attendees to these conferences may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.

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Please contact Maggie Field at mfield@euci.com or 720-988-1250 for more information.
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Substitutions & Cancellations
Your registration may be transferred to a member of your organization up to 24 hours in advance of the event. Cancellations must be received on or before December 16, 2016 in order to be refunded and will be subject to a US $195.00 processing fee per registrant. No refunds will be made after this date. Cancellations received after this date will create a credit of the tuition (less processing fee) good toward any other EUCI event. This credit will be good for six months from the cancellation date. In the event of non-attendance, all registration fees will be forfeited. In case of conference cancellation, EUCI’s liability is limited to refund of the event registration fee only. For more information regarding administrative policies, such as complaints and refunds, please contact our offices at 303-770-8800. EUCI reserves the right to alter this program without prior notice.