OVERVIEW

The growth of distributed generation (DG) and distributed energy resources (DERs) is challenging many of the assumptions upon which traditional utility system planning relies. In many regions already, DER penetration is reaching levels at which it has a measurable impact on system planning and operations. For example, DERs are creating two-way power flows on the distribution and transmission grids that legacy equipment was not designed for. DERs are also confounding conventional load forecast methodologies and complicating system modeling by introducing new kinds of generation sources or modifying load profiles.

DER adoption is driven by three major developments:

1. Advances in technologies that accommodate multi-directional, rather than uni-directional, power flows
2. Fundamental shifts in generation, distribution and transmission grid profiles
3. Changing, “more democratic” concepts about the relationship between utility service models and customer pricing

DERs, though, are not just one thing; rather, they are many things. Therefore, a treatment of the system impacts of DER must address several elements that comprise DERs, and how they produce different impacts.

This program is a primer. It is intended to collect — in one forum — the content necessary for utilities, load-serving entities (LSEs), grid operators, project developers and others to develop their own internal system for evaluating the impact of DG and DER development on their system(s). It is not intended to be an advocacy forum for or against the adoption of these technologies, nor for their implementation. Rather, it will offer instruction in the analytical and operational tools that will provide a useful cross-disciplinary blueprint for reference, adaptation and refinement.

LEARNING OUTCOMES

Through presentations and panel discussions, attendees will have the opportunity at this symposium to consider the following elements as to how distributed energy resources (DER) are changing utility and power industry norms:

- Evaluate the different types and classes of DERs and their special requirements
- Identify the operational differences between renewable and conventional energy DERs
- Review regulatory matters that determine how DERs are governed on a jurisdictional basis
- Examine long-term planning assessment and analysis that properly incorporates DERs
- Discuss challenges that DERs present to existing utility compacts/business models and what options are available to address these issues
- Assess system data access and transparency requirements to facilitate DERs
- Evaluate operational tools required for real-time DER modeling and forecasting
- Discuss DER interconnection issues at the distribution, sub-transmission and transmission levels

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AGENDA

Thursday, September 29, 2016

8:00 – 8:30 a.m.  Registration and Continental Breakfast

8:30 – 8:45 a.m.  Welcome and Overview

8:45 – 9:00 a.m.  Definition(s)

9:00 – 9:30 a.m.  Types
  • PV
  • Energy storage
  • Electric vehicles
  • Combined heat & power (CHP)
  • Turbines, generators and reciprocating engines
  • Microgrids
  • Virtual power plants (VPPs)
  • Demand side management
    o Demand response
    o Energy efficiency

9:30 – 10:30 a.m.  Distinctions
  • Applicable technologies and resources
    o Renewables
    o Non-renewables
    o Both of the above with and without storage
    o Storage (standalone)
    o DSM
  • Classes
    o Customer-developed
    o Utility-developed
    o Continuum of self-supply to grid-supply
    o Behind-the-meter
    o Utility side-of-the-meter

10:30 – 10:45 a.m.  Morning Break

10:45 – 11:15 a.m.  Criteria
  • Size
  • Location
    o Region of the country
    o Proximity/relationship to distribution utility
  • Primary generation (of offset) time of day
AGENDA

Thursday, September 29, 2016 (Continued)

11:15 a.m. – 12:00 p.m. Challenges to Existing Utility Compact/Business Model
   • Reduced system operational transparency
   • System stability and protection
   • Load (and corresponding revenue) reduction
   • Cost / value methodology selection and analysis
   • Cost / value application and imposition process
   • Cost allocation provisions and measures
   • Utility rate structures

12:00 – 1:00 p.m. Group Luncheon

1:00 – 1:45 p.m. Jurisdictional Matters
   • DERs operating in Wholesale Markets
   • DERs operating in traditional vertically-integrated (non-markets) utilities’ service territories
     o Enabling legislation and state utility oversight governance
     o FERC
     o NERC
     o ISO/RTO
   • DERs in public owned utilities’ service territories

1:45 – 2:30 p.m. Development Scenarios
   • Utility
   • Third-party (collaboration)
   • Third-party (market-imposed)

2:30 – 2:45 p.m. Afternoon Break

2:45 – 4:45 p.m. Strategic Planning: Long-term Assessment and Analysis
   • Determining impact studies required
   • System power flow modeling
   • Hosting capacity requirements and availability
   • Distribution and bulk power systems’ impacts
   • Mitigation measures identification for protection/safety limit violations
   • Valuing locational costs and benefits
   • Monitoring and control options and requirements
   • Infrastructure deployment and system awareness
   • Utility-driven vs third-party-driven installations
   • Revenue (reduction) modeling

4:45 p.m. First Day Adjournment
Friday, September 30, 2016

7:30 – 8:00 a.m.  Continental Breakfast

8:00 – 9:15 a.m.  System Data Access, Transparency and Utilization
• Systems integration and engineering analysis
• Grid impact and optimization
• Customer information and program optimization
• Market strategies development

9:15 – 10:00 a.m.  Operational Tools Required
• Real-time modeling, forecasting and scenario balancing
  o System impacts
  o Load shape
  o Utility rate structures
  o Customer adoption rate
  o Relationship of incentives to load shapes
  o Mitigation considerations

10:00 – 10:15 a.m.  Morning Break

10:15 – 11:45 a.m.  Interconnection Issues
• Distribution level
• Sub-transmission level
• Transmission level

11:45 a.m.  Program Adjourns
INSTRUCTORS

Andy Colman / Managing Director / Black & Veatch

Andy Colman leads the Analytics and Business Performance offering for Black & Veatch Management Consulting, LLC, a wholly owned subsidiary of Black & Veatch Holding Company. He works with clients to develop new approaches to analyze, plan and execute grid modernization in an era of distributed energy resources. Prior to joining Black & Veatch in early 2014, Mr. Colman was CEO of GRIDiant Corp, a provider of grid optimization software that was acquired by Landis+Gyr. He has more than 25 years of experience in energy management software and hardware for both the commercial real estate and electric utility industries. He has assisted office buildings and chain stores in energy efficiency initiatives including Energy Star and LEED certifications, and with solar PV deployment. Mr. Colman was CEO of EnFlex, a pioneer in building energy management and solar monitoring that was acquired by SunEdison. Earlier he was a consultant with Booz, Allen & Hamilton focusing on utility organization and strategy.

Brian Fitzsimons / CEO / Qado Energy

Brian Fitzsimons is CEO and founder of Qado Energy. He started the software firm in 2009 to help make global electricity systems more sustainable and renewable. Qado Energy provides electric distribution system analytics Software as a Service (SaaS) to utilities, renewable developers, and other commercial clients. The service enables clients to use a singular platform to analyze and manage the processes of interconnection applications, distributed generation impact analysis, as well as DER planning and optimization to cut the time required for complex analytic efforts. He is a pioneer in the use of XML for automated data integration, transformation, collaboration and management. He has actively contributed to global data standards development in several industries and is currently an active analyst of the IEC Smart Grid Data Standards. Prior to Qado Energy, Mr. Fitzsimons founded and successfully grew innovative software companies in the media, publishing, and financial services industries. He holds three patents in the areas of data transformation and automation.

Dr. Jeremy Hargreaves / Senior Consultant / E-Three

Dr. Jeremy Hargreaves is a senior consultant at Energy and Environmental Economics, Inc (E3). He possesses extensive knowledge and experience in distributed resource planning and evaluation, system flexibility planning under high renewable penetrations, retail rate design, dispatch and storage modeling, and resource planning and procurement. Most recently Dr. Hargreaves was technical lead on evaluating the costs and benefits of distributed energy resources (DER), informing resource planning and strategy for Tata in Delhi, India. He was also primary author of a white paper on how to capture local value from deferring distribution system upgrades through DER for Pacific Gas and Electric. Prior to that, he managed the design and development of the Integrated Demand Side Management (IDSM) model for Consolidated Edison in New York, which earned a 2014 Utility Analytics Institute Innovation Award. Dr. Hargreaves’ has done distributed generation cost and potential studies for the three IOUs in California, and for policy planning at the California Public Utilities Commission. He is a principal architect of the E3 REFLEX model for long-term system capacity and flexibility planning. Dr. Hargreaves joined E3 after completing his PhD in Geography and Environmental Engineering at the Johns Hopkins University. His research involved using optimization modeling techniques for stochastic unit commitment and dispatch of high renewable energy penetration electricity systems, and economic decision support in land and energy management. He also holds a MSE in Environmental Management and Economics from Johns Hopkins, and a MEng in Chemical Engineering from Imperial College, London.
INSTRUCTORS

Daniel Haughton / Manager – Distributed Energy Resources Integration & Analysis / Arizona Public Service (APS)

Daniel Haughton is a lead/supervising transmission operations engineer and Manager – Distributed Energy Resources Integration & Analysis at Arizona Public Service (APS). His duties include:

- Supervision of a high-performance team of 8 transmission operations engineers and consulting engineers in utility operations
- Coordination of technical power flow, transient stability, and voltage margin studies for seasonal, next-day and/or current day system analysis
- Representing the interests of the transmission operations engineering group to APS management
- Representing APS interests at technical committee meetings, sub-regional study groups, the reliability coordinator (RC) and other external entities
- Serving as subject matter expert (SME) for specific NERC Standards related to transmission operations
- Interfacing with the Energy Control Center (ECC) leaders and operators and IT to ensure real-time tools performance meets expectations and produces accurate results as judged by both engineers and operators
- Provides training, development and growth opportunities for the engineering team

Mr. Haughton has worked at APS for four years. Prior to that, he was in various roles at Tampa Electric, CAISO, Intel Corp and Arizona State University.

Dan Wilson / Renewable Energy Consultant / Black & Veatch

Dan Wilson is a Renewable Energy Consultant in Black & Veatch’s power business, focusing on the intersection of the electric utility sector with renewable and distributed energy resources. Over the past five years, he has led numerous studies for utilities and other clients related to grid integration of renewable and distributed resources, quantifying the value of solar, integrated resource plans (IRPs), distributed solar PV potential across large geographic areas, solar policy design, customer-facing solar program management, implementation of new software to streamline solar incentives and interconnection, solar PV and battery storage feasibility analysis, and distributed energy planning for smart cities.
INSTRUCTIONAL METHODS

Case studies and PowerPoint presentations will be used in this program.

PROCEEDINGS

The proceedings of the course will be published, and one copy will be distributed to each registrant at the course.

REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

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

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 1.2 CEUs for the course.

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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.

EVENT LOCATION

A room block has been reserved at the Sheraton Denver Tech Center, 7007 S Clinton Street, Greenwood Village, CO 80012, for the nights of September 28-29, 2016. Room rates are $149, plus applicable tax. Call 1-303-799-6200 for reservations and mention the EUCI course to get the group rate. The cutoff date to receive the group rate is September 14, 2016, but as there are a limited number of rooms available at this rate, the room block may close sooner. Please make your reservations early.
DISTRIBUTED RESOURCE (DER) SYSTEM PLANNING 101: SEPTEMBER 29-30, 2016: US $1395
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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 August 26, 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.