FLEXIBLE AND FAST RESPONSE
CONTROLLABLE RESOURCES
HOW UTILITIES ARE USING DERs TO DEAL WITH
GRID CHALLENGES

September 26-27, 2016
Renaissance San Diego
San Diego, CA

Post-Conference Workshop
REVENUE OPPORTUNITIES INVOLVING FLEXIBLE AND FAST
RESPONSE MARKET STRATEGIES
September 28, 2016
OVERVIEW

The increasing penetration of renewable energy resources — combined with the gradual, but inexorable, shift away from traditional baseload generation and other changes in the distribution and grid profile — are creating new challenges for utilities/load-serving entities, balancing area authorities and transmission system operators. The need for grid-integrated resources that can deliver fast ramp and flexible balancing resource options has led to examination of what technologies already exist that can provide such resource characteristics economically over a long-term planning time-frame to ensure grid stability and reliability. The list of technologies and devices includes such things as PV, aggregated DR and other behind-the-meter resources, flexible storage devices such as grid-integrated water heaters and ice, community storage, virtual power plants and electric vehicles.

This program will explore what North American and international utilities, load-serving entities, merchant generators, balancing authorities, and regional transmission system operators are doing to define, evaluate and implement strategies that allow their systems to better integrate flexible resource approaches into their operations. It will devote special attention to the sources of flexible-load distributed energy resources (DERs) already available to provide flexible and fast response services, and how utilities can leverage these existing resources within their systems. In addition, it will examine what the organized electricity markets are doing to accommodate these flexibility products and services in their short-term (day-ahead and real-time) markets. Finally, the program will assess the role that market participants, project developers, and technology providers will play in bringing these services, products, and other strategies into the grid mainstream.

“The program offered a timely and insightful view into the increasing value of flexible resources that is critical to any operations across the country and world.”
– Director – Energy Procurement, Hawaiian Electric

LEARNING OBJECTIVES

Attendees will cover materials and engage in discussions that will allow them to:
• Discuss why flexibility in distribution and grid operations is an issue that now affects utilities, load-serving entities, merchant generators, balance authorities and ISOs
• Discuss the sources of flexible-load distributed energy resources (DERs) already available to provide flexible and fast response services
• Identify planning tools to project short-term and long-term, 15 min, 5 min and other frequency flexibility requirements
• Evaluate specific modeling approaches for aligning operational requirements to meet flexibility needs
• Assess through case studies what some utilities have done to address their flexibility requirements using flexible-load DERs
• Examine how various ISOs are accommodating flexible-load DERs in intra-hour markets and bidding
• Discuss how utilities can convert existing, flexible-load DERs into their dispatch options
AGENDA

Monday, September 26, 2016

7:30 – 8:00 a.m.  Registration and Continental Breakfast
8:00 – 8:15 a.m.  Welcome and Program Overview
8:15 – 9:00 a.m.  What Is Flexibility and Why Is It a Big Issue All of Sudden?
   • Flexibility described
   • What are the changes that make flexibility and fast response important
   • Where and why is it needed now
   • What roles can flexible-load DERs play in contributing to grid solutions
9:00 – 10:00 a.m. Evaluating Exposure at Utility, Balancing Area and System Operator (Organized Market) Levels
   • Flexibility metrics
   • Modeling of transition between markets
   • “Missing money” problem
   • Impact of high renewable energy resources penetration on capacity and reliability
   • The “duck curve” over-generation phenomenon
   • Negative pricing and curtailment
   • Cost of flexibility
   • Long-term planning and developing flexible capacity
   • Transmission and flexibility requirements
10:00 – 10:15 a.m. Morning Break
10:15 – 11:00 a.m. What Are Flexible-Load DERs?
   • PV (roof-top and roof-less)
   • Aggregated behind-the-meter resources
   • Community storage
   • Flexible storage devices
   o Grid integrated water heaters (GIWH)
   o Ice storage
   • Virtual power plants (VPP)
   • Electric vehicles
   • Microgrids
   • Commercial building fleet
   • Other currently available technology-simple options
11:00 a.m. – 12:00 p.m. In the Utility Context, How Are Current and Future Flexible Load Strategies Different from Past Practices?
   • Past
   o Demand response
   o Energy efficiency
   o Conservation
   o Baseload-driven generation
   • Future
   o Intelligent efficiency
   o Negative pricing
   o Grid interactivity and support
   o Customer awareness, acceptance of two-way electricity functionality
   o Customer participation in time- and price-sensitive electricity rates
   o Role of H.R. 906 and various FERC Orders
   o Dispatchability and intra-hour responsive generation options
12:00 – 1:00 p.m.  Group Luncheon
AGENDA

Monday, September 26, 2016 (Continued)

1:00 – 2:15 p.m.  What Adjustments will be Required to Convert the Promise into Reality?
   •  Technology-related aspects
     o  Inverter-based functions
     o  Communications and control
     o  Metering and billing
     o  Software platform(s)
   •  Contractual-related aspects
   •  Utility and market-related aspects
     o  Measurement and verification (M&V)
     o  Standard system management protocol
     o  Net metering and self-supply

2:15 – 3:30 p.m.  Why Controllable, Flexible Load Resources Capabilities Make Sense for Rate-based Utilities
   •  Electricity in / electricity out / thermal out
   •  Load-control strategies
     o  Creating flex load to follow generation
     o  Peak shave
     o  Thermal energy storage
     o  Fast response
     o  Frequency regulation
     o  Energy price arbitrage
     o  Capacity value capture through curtailment
     o  Vertically integrated utility operations
     -  Contribute to grid balancing required by renewable energy deployment

3:30 – 3:45 p.m.  Afternoon Break

3:45 – 5:15 p.m.  Why Controllable, Flexible Load Resources Capabilities Make Sense for Rate-based Utilities (Continued)
   •  Program-related aspects
     o  What’s in it for us (utilities)?
     o  Does accommodating DERs mean a fundamental change in the traditional business compact?
     o  Who initiates program engagement?
     o  Does the consumer require active management of appliance?
     o  Monthly bill credit or appliance rebate or none of-the-above?

5:15 – 6:15 p.m.  Networking Reception

Outstanding material. The group dialogue really facilitated learning.”
– Manager – Resource Planning, Puget Sound Energy (PSE)

If you are in the energy business in California, you need to take this program – outstanding speakers!”
– Director – Asset Management, CalPeak Operating Services

REGISTER TODAY! CALL 303-770-8800 OR VISIT WWW.EUCI.COM
**AGENDA**

**Tuesday, September 27, 2016**

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

8:00 – 10:00 a.m.  Why Controllable, Flexible Load Resources Capabilities Make Sense for Rate-based Utilities (Continued)
  - Valuing grid-related aspects
  - Reliability
    - Pivoting to load that follows generation
    - Support higher penetration of renewable energy
    - Fast response
    - Time-shifting
    - DER integration relationship to traditional generation resources
  - Economics
    - Generation capacity expansion deferral
    - T&D capital investment deferral
    - Energy load reduction during high-priced hours
    - Frequency regulation
  - Environmental footprint
    - Emissions avoidance/reduction
    - Type of marginal fuel mix displaced

10:00 – 10:15 a.m.  Morning Break

10:15 a.m. – 12:00 p.m.  Why Controllable, Flexible Load Resources Capabilities Make Sense for Rate-based Utilities (Continued)
  - Market scenario-related aspects
    - Re-structured wholesale markets
      - Follow locational marginal pricing
      - Ancillary services revenue bonus
      - Other FERC Order-based options
      - Transactional mechanisms
    - Procurement considerations
      - DER qualifiers
      - Bidding mechanisms
      - Dispatch capacity and availability

12:00 – 1:00 p.m.  Group Luncheon

1:00 – 2:00 p.m.  The Utility Business Case: Why Should Utilities Embrace New Flexible Load Capabilities?
  - Flex load optimizes operations at a fraction of “new build” infrastructure cost
  - Ownership models create new product sales and retain existing customers
  - Options for utility ownership and growing sales of kWh

2:00 – 3:00 p.m.  The Customer Value Proposition: Why Should Customers Embrace New Grid-interactive Flexible Devices and Rate Structures?
  - Customer power to control energy consumption
  - Customer power redundancy
  - Opportunity for “net” billing of customer power delivered to grid to offset power received from grid (the new utility + customer paradigm)
  - For C&I or multiple aggregated resources, the possibility of creating or managing a value-added revenue stream

3:00 – 3:15 p.m.  Afternoon Break
Tuesday, September 27, 2016 (Continued)

3:15 – 4:30 p.m.  How Does the Utility Industry Get from Here (Limited Application of Flexible Load Capabilities) to There (Significant Application of Flexible Load Capabilities)?
   • Organizational planning
   • Commission and regulatory path
   • Consumer and stakeholder engagement
   • Supplier coordination

4:30 p.m.  Conference Adjourns

PRESENTERS

Neil Alexander, Utility Services Account Executive, Trane

Frances Cleveland, Chair of the Smart Inverter Working Group (SIWG) and President/ Principal Consultant, Xanthus Consulting

Keith Dennis, Senior Principal – End Use Solutions and Standards, Senior Principal, End-Use Solutions and Standards, National Rural Electric Cooperative Association (NRECA)

Ross Malme, Partner, Skipping Stone

Kelly Murphy, Business Development Specialist, Steffes

Alex Papalexopoulos, President & CEO, ECCO International (ECCO)

Ty Peck, Honeywell Smart Grid Solutions

Josh Rasin, Project Manager – Demand Response R&D, Sacramento Municipal Utility District (SMUD) invited

Brian Zimmerly, Senior Energy Engineer, SolarCity
INSTRUCTIONAL METHODS

Case studies, PowerPoint presentations and group discussion will be used in this event.

REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

Participants must sign in/out each day and be in attendance for the entirety of the event 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 1.4 CEUs for the conference and 0.4 CEUs for the post-conference workshop.

EVENT LOCATION

A room block has been reserved at the Renaissance San Diego, 421 W B St., San Diego, CA 92101 for the nights of September 25-27, 2016. Room rates are $179, plus applicable tax. Call 1-619-398-3100 for reservations and mention the EUCI program to get the group rate. The cutoff date to receive the group rate is September 5, 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.

REGISTER 3 SEND 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.

PROCEEDINGS

A copy of the conference proceedings will be distributed to attendees at the event. If you are unable to attend or would like to purchase additional copies, a downloadable link will be available two weeks after the conference is complete. The cost per download is US $395. The link includes visual presentations only. Upon receipt of order and payment, the link will be sent to you via email.

NOTE: All presentation sales are final and are nonrefundable.

SPONSORSHIP OPPORTUNITIES

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REGISTRATION INFORMATION

Mail Directly To:
Electric Utility Consultants, Inc. (EUCI)
4601 DTC Blvd., Ste. 800
Denver, CO 80237
OR, scan and email to: conferences@euci.com
WWW.EUCI.COM
P: 303-770-8800
F: 303-741-0849

PLEASE REGISTER THE FOLLOWING

☐ FLEXIBLE AND FAST RESPONSE CONTROLLABLE RESOURCES CONFERENCE, SEPTEMBER 26-27, 2016: US $1495
EARLY BIRD ON OR BEFORE SEPTEMBER 9, 2016: US $1295

☐ I'M SORRY I CANNOT ATTEND, BUT PLEASE SEND ME A LINK TO THE CONFERENCE PROCEEDINGS FOR US $395.

How did you hear about this event? (direct e-mail, colleague, speaker(s), etc.)

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Company

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OR Enclosed is a check for $ _______________ to cover _______________ registrations.

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.

EUCI's Energize Weekly e-mail newsletter compiles and reports on the latest news and trends in the energy industry. Newsletter recipients also receive a different, complimentary conference presentation every week on a relevant industry topic. The presentations are selected from a massive library of more than 1,000 current presentations that EUCI has gathered during its 28 years organizing conferences.

Please make your reservations early.

OR

Enclosed is a check for $ _______________ to cover _______________ registrations.