

STORAGE DEPLOYMENT AND IMPLEMENTATION

August 2-3, 2017
Westchester Marriott
Westchester, NY

PRE-SYMPOSIUM WORKSHOP

Battery Technology Fundamentals

WEDNESDAY, AUGUST 2, 2017

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



OVERVIEW

While solar has been hot in terms of deal flow, investment and deployment in recent years, the energy storage industry is undergoing its own revolution and emergence into the main stream. Energy storage is a crucial tool for enabling the effective integration of renewable energy and unlocking the benefits of local generation and a clean, resilient energy supply. The technology is now proving its value to grid operators around the world who must manage the variable generation of solar and wind energy.

In many parts of the U.S., states are working to advance the technology through procurement mandates, pilot programs, and market design changes aimed at recognizing the services that can be provided by a range of energy storage applications. The Northeast states in particular, are pursuing market and regulatory changes to integrate more storage. As this and other regions plan for a system that is more dependent on variable renewable resources, energy storage will play an important role in providing cost-effective and reliable electricity.

This symposium will provide an overview of the regulatory landscape, distributed generation, load profiles, the economic justification of storage, challenges of interconnection, non-wire alternatives, mobile storage and lessons learned. The symposium materials provide valuable information on a full spectrum of applications for utilities, regulatory agencies, project developers, private investors, finance firms, wholesale market participants, and owners of existing wind and solar power plants.

LEARNING OUTCOMES

- Discuss the latest development and trends in energy storage
- Discuss the current regulatory landscape for battery technologies
- Explain the storage battery interconnection process
- Evaluate the economic justification for storage
- Identify the current and future roles for storage with customer load profiles
- Explain emerging role of storage batteries
- Discuss the growth and mechanics of distributed energy storage markets



“Electricity people talking to electricity people: great contacts, great content!”

Power Resources Manager, Burbank Water & Power



“I was very glad to see how much progress is occurring in the industry and that all critical stakeholders were engaged in a constructive conversation at the EUCL event.”

Senior Director, 24M



“Conferences like these prove how much EUCL contributes to the utility industry in gathering so many views.”

Engineering Services and Rates Director, IREA

AGENDA

WEDNESDAY, AUGUST 2, 2017

12:30 – 1:00 pm

Registration

1:00 – 5:30 pm

Symposium Timing

Session I: Policy/Regulatory/Legal Landscape

On the regulatory side, the storage industry has gained strong momentum recently from FERC dockets that have the potential to improve the market. This session will define policy/regulatory landscape for battery technologies, policy issues, regulatory challenges, interconnection/control standards and functionality, industry/utility standards for discharge, response time, etc.

- a. Federal/State
- b. Interconnection rules/standards
- c. DERMS platform
- d. Northeast and other regional regulatory storage perspectives—status and trends

Paul Hibbard, Vice President, Analysis Group (Former Chair, Massachusetts Dept. Public Utilities)

Andrew Kaplan, Partner, Pierce Atwood LLP

David South, Senior Principal Energy & Utilities Practice, West Monroe Partners

3:15 – 3:30 pm

Networking Break

Session II: Distributed Energy Storage

The relationship between utilities and their C&I customers is rapidly changing: C&I enterprises are becoming electricity producers as well as consumers, and profit from actively managing the shape and timing of their energy use. Distributed energy storage is empowering next-generation energy storage-based services on both sides of the electricity meter: reducing energy costs and increasing resiliency for C&I enterprises, while improving efficiency, predictability, and dispatch-ability of distributed assets for utilities that serve them.

This session will provide a landscape of current market and use cases, storage types, experiences, market players and the state of technology

- a. Market and use cases
- b. Technologies available for local storage
- c. The benefits that local storage can provide
- d. Market, rate and tariff challenges to monetizing the benefits of storage, and potential solutions

Jim McClanahan, Senior Principal Energy and Utilities Practice, West Monroe Partners

Paul A. DeCotis, Senior Director Energy & Utilities Practice, West Monroe Partners

Shelly Hagerman, Experienced Consultant Energy & Utilities Practice, West Monroe Partners

5:30 pm

Networking Reception

THURSDAY, AUGUST 3, 2017

7:45 – 8:15 am

Continental Breakfast

8:15 am – 4:30 pm

Symposium Timing

12:00 – 1:00 pm

Group Luncheon

AGENDA

THURSDAY, AUGUST 3, 2017 (CONTINUED)

Session III: Energy Storage: Role in the Market, Competing Resources

Energy storage deployments in the northeast and emerging markets worldwide are expected to grow substantially in the coming decade. This session will define the current and future roles for storage and how the customer load profile drives strategic calculations and tactical decisions

- a. Role of Storage (Generation v. Load Modifier)
- b. Alternative Services (VAR, FR)
- c. Competitive Alternatives
 - i. Local/behind the substation solutions
 - ii. Non-Wire alternatives (DER, EE, DR)
 - iii. Electric vehicle storage
 - iv. Mobile storage
 - v. Other types of storage

Paul Hibbard, Vice President, Analysis Group (Former Chair, Massachusetts Dept. Public Utilities)

Mike Jacobs, Electricity Markets Lead, Union of Concerned Scientists

Bob Foxen, Owner, Global Common

Session IV: Economics/Value Proposition

The value proposition of energy storage changes significantly depending on where it is deployed on the electricity grid. This session will examine the current and future landscape for different applications, the value stack, economic justification, current/emerging market functions and an illustrative business case.

- a. Markets/Roles
 - i. Stand-alone (feeders, substations, etc.)
- b. Solar + Storage (new, retrofit)
- c. Arbitrage opportunities, aggregators
- d. Business case

Joyce McLaren, Senior Research Analyst, National Renewable Energy Laboratory (NREL)

Matthew Stedl, Development Director, Tradewind Energy

David South, Senior Principal Energy & Utilities Practice, West Monroe Partners

Session V: Vendor Panel:

As the demand for storage to support the distribution grid expands, available storage solutions emerge. In this segment, vendors take on inquiries as to how their storage solutions have become more easily scalable and how they can be deployed.

Kevin Fok, Senior Project Manager, LG Chem

Andy Marshal, Senior Product Manager, Landis+Gyr

Session VI: Grid Connected Storage: Interconnection and Operations

Interconnection standards dictate the technical, legal, and procedural requirements that customers, project developers and utilities must follow for interconnecting new generation to the electric grid. This session will provide an introduction to important aspects of general interconnection standards and requirements specifically applicable to energy storage projects.

- a. History and background of interconnection to the grid
- b. Benefits of grid-connected battery storage and grid applications
- c. Challenges of grid-connected battery storage
- d. Optimizing grid-connected battery storage to enhance renewable energy performance
- e. Improving the processes for energy storage interconnection

Andrew Kaplan, Partner, Pierce Atwood LLP

Jim McClanahan, Senior Principal Energy and Utilities Practice, West Monroe Partners

George Crabtree, Director, Joint Center for Energy Storage Research (invited)

AGENDA

THURSDAY, AUGUST 3, 2017 (CONTINUED)

Session VII: Lessons Learned Panel

As storage pilot projects and larger implementations have now come on board and have interconnected to the grid, this Panel will discuss the successes and pitfalls of their projects providing education for developers and PPA buyers so they can accomplish future projects in a faster, more efficient manner allowing for reduced costs and improved results.

Panel Discussion

Session VIII: Open Q&A Session and Wrap Up

The symposium chairs will provide a recap of the key points that were covered during the event. This closing session will also allow conference attendees to ask questions about the storage presentations and any issues, ideas or problems that come to mind.

David South, Senior Principal Energy & Utilities Practice, West Monroe Partners

Paul A. DeCotis, Senior Director Energy & Utilities Practice, West Monroe Partners

4:30 pm

Symposium Adjourns

SPEAKERS

George Crabtree

Director, Joint Center for Energy Storage Research (invited)

Paul A. DeCotis

Senior Director Energy & Utilities Practice, West Monroe Partners

Kevin Fok

Senior Project Manager, LG Chem

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Senior Principal Energy & Utilities Practice, West Monroe Partners

Matthew Stedl

Development Director, Tradewind Energy



“Had the right speakers with knowledge of the topics and a good cross section of discussion topics.”

Senior Engineer, PJM
Interconnection

PRE-CONFERENCE WORKSHOP

Battery Technology Fundamentals

WEDNESDAY, AUGUST 2, 2017

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

8:30 – 11:30 am **Workshop Timing**

OVERVIEW

As North America moves increasingly towards more renewable energy sources and away from fossil fuels, new technologies must emerge to capture energy production as well as provide new ways to store and deliver power. An ongoing issue with solar and wind production is the inability to predict exactly when its production will occur and when the consequent power can be dispatched. One of the technological responses that provides at least a partial answer to this dilemma is battery energy storage systems, whose integration into the electricity grid have become increasingly important as they can help support multiple grid services..

In this workshop, attendees will hear from industry experts about the current state of battery technology, developers/manufacturers/BOP, scale/application challenges and research, development & demonstration.

LEARNING OUTCOMES

- Discuss current status of battery storage technologies such as Lithium ion, deep cycle, and lead acid batteries, and state-of-the-art battery materials and chemistries
- Discuss the effectiveness the battery storage technologies that have been deployed
- Evaluate current battery technology supporting energy storage programs
- Discuss how future technologies will improve and advance storage

WORKSHOP AGENDA

- a. Battery Types and Chemistry
- b. Market Players
- c. Critical Factors
- d. Breakthrough Expectations
- e. Role of Storage Batteries in Future Power Grids
- f. Storage Battery Market Segments
- g. Conclusions

WORKSHOP INSTRUCTOR



Shelly Hagerman
Experienced Consultant, West Monroe Partners

In her role, Ms. Hagerman helps clients understand complex problems using advanced modeling capabilities to build solid business case analysis. Prior to West Monroe, Shelly received a PhD from Carnegie Mellon University in Engineering & Public Policy. Her thesis focused on the economics of behind-the-meter solar photovoltaics and energy storage. Since joining West Monroe, Shelly has been a lead developer for a project to examine how various rate structures and policies affect solar photovoltaics and energy storage economics.

SPONSORSHIP OPPORTUNITIES

Do you want to drive new business through this event's powerful audience? Becoming a sponsor or exhibitor is an excellent opportunity to raise your profile before a manageably sized group of executives who make the key purchasing decisions for their businesses. There is a wide range of sponsorship opportunities available that can be customized to fit your budget and marketing objectives, including:

- Platinum, gold, or VIP sponsor
- Reception host
- Networking break host
- Tabletop exhibit
- Workshop sponsor
- Lanyard sponsor
- Luncheon host and Breakfast host

Please contact Grant Neptune at gneptune@euci.com or 720-988-1248 for more information.

INSTRUCTIONAL METHODS

This program will include PowerPoint presentations and panel discussions

REQUIREMENTS FOR SUCCESSFUL COMPLETION

Participants must sign in/out each day and be in attendance for a minimum of four hours to be eligible for any 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 symposium and 0.3 CEUs for the workshop

EVENT LOCATION

A room block has been reserved at the Westchester Marriott, 670 White Plains Road, Tarrytown, NY 10591, for the nights of August 1-3, 2017. Room rates are \$165 USD, plus applicable tax. Call **914-631-2200** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is July 3, 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 this event 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

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PLEASE REGISTER

- STORAGE DEPLOYMENT AND IMPLEMENTATION SYMPOSIUM AND WORKSHOP:**
AUGUST 2-3, 2017: US \$1795
Early bird on or before July 14, 2017: US \$1595
- STORAGE DEPLOYMENT AND IMPLEMENTATION SYMPOSIUM ONLY**
AUGUST 2-3, 2017: US \$1395
Early bird on or before July 14, 2017: US \$1195
- PRE SYMPOSIUM WORKSHOP ONLY**
AUGUST 2, 2017: US \$595
Early bird on or before July 14, 2017: US \$495
- I'M SORRY I CANNOT ATTEND, BUT PLEASE EMAIL ME A LINK TO THE SYMPOSIUM PROCEEDINGS FOR US \$395**



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

Print Name Job Title

Company

What name do you prefer on your name badge?

Address

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Phone Email

List any dietary or accessibility needs here

CREDIT CARD INFORMATION

Name on Card Billing Address

Account Number Billing City Billing State

Exp. Date Security Code (last 3 digits on the back of Visa and MC or 4 digits on front of AmEx) Billing Zip Code/Postal Code

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 June 30, 2017 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 course 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 (201) 871-0474.