

# EVOLUTION OF ELECTRICITY MARKETS: *Disruptive Innovation & Economic Impacts*

January 29-30, 2018  
The Inn at Opryland, A Gaylord Hotel  
Nashville, TN

***Highly Interactive Course Designed to Provide a  
Practical Overview of Evolving U.S. Power Markets***



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EUCI is authorized  
by IACET to offer  
1.0 CEUs for the  
course

## OVERVIEW

The electric energy world is in the midst of dramatic and disruptive change at many levels. The convergence of technologies has never been as rapid, or as important as it is today, and the energy industry is undergoing a period of extremely fast-paced evolution that was not visible to most participants even five years ago. This highly-interactive seminar is designed to provide a practical overview of U.S. power markets and how they are evolving. It will discuss the underlying regulatory frameworks helping to facilitate this change. It will highlight important topics concerning how power markets function, and how the introduction of new technologies is creating unprecedented challenges and opportunities, and the regulatory environment that supports or inhibits this evolution. To that end, the course will address the trends and economics of renewables and distributed generation, storage, electric vehicles, rapidly evolving business models, and the emerging 'internet of things.'

## LEARNING OUTCOMES

- Define and describe the major issues related to restructured electricity markets
- Review critical issues affecting planning for resources in power markets
- Explain basic functions of Independent System Operators (ISOs) and Regional Transmission Operators (RTOs), including energy and capacity markets, dispatch of power resources, and both supply and demand curves
- Discuss considerations relating to adoption of new technologies, including economics and market rules
- Examine cost curves, technological developments, and other considerations affecting the development of renewable resources and integration into the power grid
- Analyze the impact and implications of financial structures, such as third-party financing and securitization
- Explain the role of the customer as 'prosumer' and daily bi-directional interaction of customers and power grid with Demand Response and net metering
- Identify the critical role of regulatory policy on cost-effectiveness, deployment, and adoption of new technology
- Review the impact of distributed technologies such as solar, storage, and intelligent end use assets on the electric utility industry
- Recognize the trends, challenges, and opportunities for utilities, start-ups, investors, consumers and society in the coming decade

## WHO SHOULD ATTEND

- Executives and mid-level employees from energy-related start-ups
- Attorneys, managers, and other professionals from investor-owned utilities; federal, state, and municipal utilities; and electric cooperatives
- Executives and mid-level employees from retail energy providers
- Consultants, attorneys, and engineering firms that work within the electricity sector
- Professionals seeking a deeper context and understanding of energy markets and the changing context



***"Variety of attendees interest combined with Peter's immense knowledge of current events = very valuable 12 hours."***

Director, Rates, Regs & Power Supply, IREA

# AGENDA

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MONDAY, JANUARY 29, 2017

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

**8:30 – 5:00 pm**                      **Course Timing**

**12:00 – 1:00 pm**                      **Group Luncheon**

## **Market Structures: Regulated and Restructured Competitive Power Markets**

Familiarization with the structures and rationale for various types of power markets, the evolution of competitive markets, and what each of the actors does

- The Physics of Electricity
- Regulated Monopolies
- The Rationale for, and Emergence of, Competitive Power Markets
- Today's Regulatory Construct
- FERC - Activities, Trends, Enforcement Activities
- PUCs - Roles and Responsibilities within the Context of Market Evolution
- NERC (Advisory)
- State Legislatures

## **How Competitive Markets Work (Who Does What)?**

Review of the actors and their various roles in the system

- Role and Responsibilities of ISO/RTO
- How ISOs/RTOs are Structured
- Role of Generators - System Power vs. Unit Contingent
- Capacity and Energy - Markets and Approaches
- Retail Suppliers - Role and Product Offerings
- Risk and Volatility - Price Caps and the Winter of 2013/14
- Role of Utilities

## **Electricity Generation Assets**

Familiarity with traditional generating assets and properties

- Properties of Common Generation Resources
- Capital vs. Operating Costs
- Levelized Costs of Energy
- Dispatchability of Common Resources From Coal to Wind
- The Typical Resource Stack

## **Recent Changes to the Established Order**

Explain the large recent conversion to gas-fired generation, as well as the emergence of utility-scale wind and solar

- The Role of Natural Gas-Fired Facilities in the System
- The Impact of Hydraulic Fracturing
- Current Market Dynamics
- The Introduction of Utility-Scale Wind and Solar
- Declining Cost Curves & Increased Efficiencies
- Impact of Renewables on Marginal Pricing
- Integration Issues (Transmission, Planning, and Forecasting)
- Other Current Trends in U.S. Generating Fleet (Additions and Retirements of Nuclear and Coal)

# AGENDA

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MONDAY, JANUARY 29, 2017 (CONTINUED)

**The Demand/Supply-Side Interface: It's 3:30 PM - Do You Know What Your Electrons Are Costing You?**

Explain the interaction between supply and demand and customer interaction with electricity markets

- Customer Interaction with Power Markets and FERC Orders (Demand Response)
- Customer Elasticities
- Other Emerging Products Behind the Meter (efficiency, solar, storage, reliability, dashboards)

TUESDAY, JANUARY 30, 2017

**7:30 – 8:00 am**                      **Continental Breakfast**

**8:00 am – 12:00 pm**                **Course Timing**

**The Emergence of New Technologies and the Threat to The Existing Order**

Appreciate the implications of these emerging technologies, cost and deployment curves, financing considerations, and associated regulatory policies

- Distributed Solar
- Improvements in Cost Efficiencies (Past Five Years and Projected, and Revisited Net Metering)
- Hard and Soft Cost Reductions: Room to Improve
- The Role of Third Party Financing and Other Emerging Financial Models
- The Evolution of Solar Technologies
- Hybrid Solar-Storage: Tesla First Solar Model
- Electric Vehicles and Storage
- Cost Curves, Adoption Trends, Charging Patterns, and Implications for the Power Grid
- CHP: Traditional Gas-Fired and Fuel Cells
- Applications, Basic Economics, and Value Proposition
- Better End-Use Technologies; LEDs, Controls Systems, NEST Thermostats
- Resiliency, Reliability, and Electricity
- The Emergence of Micro-grids
- Back-up Power
- Power Quality and 5 9's: Why All Electrons Are Not Alike
- How Different SICs Approach the Topic

**The Regulatory Battle and What's at Stake: Net Metering, and Other Issues**

Explain the implications for various parties involved in the regulatory debate, as well as potential alternatives

- Net Metering and What's At Stake: The Regulatory Battles in Arizona, Hawaii, Nevada, and Elsewhere
- California Targets and Implications for the Supply/Demand Curve
- The Value of Solar Approach
- The Possibilities for "The Utility Death Spiral" and Emerging Models Such as NY REV

**Innovation and Disruption: The Genie Is Out of the Bottle**

Understand the tectonic shift in innovation and new business models taking place across the industry, and why they will not slow down

- Creative Destruction, and Implications for the Electric Industry
- Cheaper Chip Sets, the Internet of Things, and Intelligence Migrates to the Periphery
- Christensen and Innovation/Disruption
- HBS New Models Concerning Innovation
- The Pace of Innovation: Energy-Related Patents and The Role of High-Performance Computing
- Turmoil Creates Opportunity
- Emerging Business Models

# INSTRUCTOR



## Peter Kelly-Detwiler

**Principal, NorthBridge Energy Partners**

Peter Kelly-Detwiler currently advises technology companies and customers concerning the integration of energy-consuming and producing assets into the power grid. He has 27 years of experience in the electric energy industry, with 15 years as an executive in competitive retail markets, since their inception in 1997. He served in various functions within the industry, including Director of Customer Care (East Coast) for NewEnergy Ventures. Prior to NorthBridge, he was Sr. Vice President of Constellation Energy's Load Response group. In this function, he created this unit and oversaw its growth to become a business with approximately \$80 mn in revenue, capable of dispatching 1700 MW of customer load.

Mr. Kelly-Detwiler lectures frequently, has appeared on public television, and is also a frequent contributor on energy-related issues (over 240 posts) to Forbes.com. In this latter capacity, he has written on topics related to wind, storage, electric vehicles, shale gas, LEDs and numerous other issues. He has interviewed executives from dozens of companies and helped to provide context and meaning in the discussion of new technologies and market developments. As a consultant, he has provided strategic support to Fortune 100 companies such as Nike and GE, and advised leading companies and start-ups in the renewable energy space.



*"Very engaging and informative."*

Lead Economist, Mitre Corporation

## REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

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

## INSTRUCTIONAL METHODS

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This program will use PowerPoint Presentations, group discussions, as well as active participation.

## EVENT LOCATION

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A room block has been reserved at the The Inn at Opryland, A Gaylord Hotel, 2401 Music Valley Drive, Nashville, TN 37214 for the nights of January 28 - 31, 2018. Room rate is \$151 plus applicable tax. Call **1-615-889-0800** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is January 8, 2018 but as there are a limited number of rooms available at this rate, the room block may close sooner. ***Please make your reservations early.***

## IACET CREDITS

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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 course.**

## REGISTER 3, SEND THE 4TH FREE

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

**REGISTRATION**  
*to register [CLICK HERE](#) or*

**Call: 201 871 0474**  
**fax: 253 663 7224**  
**email: [register@pmaconference.com](mailto:register@pmaconference.com)**  
**web: <http://pmaconference.com/>**  
**Mail: POB 2303 Falls Church Va 22042**

Please make checks payable to: "PMA"

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## PLEASE REGISTER

**EVOLUTION OF ELECTRICITY MARKETS:  
DISRUPTIVE INNOVATION & ECONOMIC IMPACTS**

January 29-30, 2018: US \$1395,  
 Early bird on or before January 12, 2018: US \$1195

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

City State/Province Zip/Postal Code Country

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 December 29, 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.