ANCILLARY SERVICES MARKETS: ADAPTATIONS TO EVOLVING REGULATORY AND TECHNOLOGY CHANGES

June 25-26, 2014
Loews Philadelphia Hotel
Philadelphia, PA

PRE-CONFERENCE WORKSHOP I
CRITICAL ELEMENTS OF ANCILLARY SERVICES MARKET DESIGN
JUNE 24, 2014

PRE-CONFERENCE WORKSHOP II
USING CO-OPTIMIZATION TO VALIDATE ISO MARKET AWARDS AND PRICES, AND MAXIMIZE ASSET PROFITS
JUNE 24, 2014
OVERVIEW

This 16th annual EUCI conference provides an expert forum for utilities, LSEs, LDCs, market participants, industrial loads, service/technology providers and regulators dealing with ancillary services to:

- Review ancillary service fundamentals, including cost and benefits
- Discuss the full range of applications and resources that can provide ancillaries
- Examine current market efforts to overcome ancillary services (A/S) market participation barriers and optimize their solutions
- Recognize immediate, emerging and potential economic opportunities for A/S market participation
- Address constraints and opportunities relating to changes in Regulation markets
- Determine the potential applications and issues associated with emerging fast ramping and flexi-ramping products

In the last few years, the role of ancillary services (A/S) in assuring North American power system reliability has broadened significantly. The provision of regulation and other services used to be the exclusive domain of generators and other supply sources. That bias has been addressed in part through several FERC Orders and ISO/RTO measures to enable demand side and other variable energy resources (VERs) to now compete for providing all the ancillary services, including regulation and spinning reserves, in several regions. Yet, there’s more to be done. Issues like valuing dispatchable capacity, using demand curves to gauge the market, evaluating increasing wind penetration impacts, effective scarcity pricing, fleet and fuel switching, system co-optimization, usage of operationally complex plants, and storage all become critical issues to understand as the role of ancillary services expands.

This conference will inform attendees through specific updates on how ISO/RTO markets and independent balancing areas in North America are satisfying expanding ancillary services’ needs. In addition, it will consider how regulatory and policy drivers influence ancillary services market mechanisms. It will also examine issues and strategies that market participants can invoke to improve their performance in providing ancillary services.

WHO SHOULD ATTEND

- **Power industry personnel** who need to have a better understanding of what Ancillary Services are, how they are competitively procured, how they are scheduled, and how and when they are called upon
- **Portfolio managers and traders** responsible for formulating bidding strategies for ancillary services
- **Power-plant and systems operations engineers** who would like to understand the impact of ancillary services on their plant profitability
- **Genco and DR executives** who need a good understanding of the potential impacts and opportunities of ancillary-service markets on their operations
- **Personnel of Independent System Operators, attorneys, and regulators** who need to understand the function of ancillary services, co-optimization measures, and reliability implications in various markets
- **Power marketing professionals** responsible for optimizing their fleet utilization and profitability
- **Demand side, demand response and aggregation services** that must capitalize on access opportunities across multiple AS markets

LEARNING OUTCOMES

Attendees will hear presentations and engage in discussions that will:

- Interpret FERC Orders and other actions that affect A/S markets
- Address participation challenges in the regulation markets
- Evaluate A/S cost, value and bidding approaches
- Review the impact of FERC’s pay-for-performance order on the A/S markets
- Examine demand-side ancillary services market applications
- Identify the options of faster ramp and more accurate provision of regulation
- Discuss whether allocating A/S costs should be based on cost causation
- Assess the increased role of demand response in A/S
- Examine the need for inertia, virtual trading and other new A/S products, services and pricing models

Great diversity of speakers and perspectives on a complex topic.”

– Senior Director, CPS Energy
AGENDA

Wednesday, June 25, 2014

7:30 – 8:00 a.m.  Registration and Continental Breakfast
8:00 – 8:15 a.m.  Welcome and Overview
8:15 – 9:00 a.m.  Significant Developments in Ancillary Services Markets

This introductory session will identify several of the major issues and developments that have influenced the conduct and development of ancillary services (A/S) markets in recent months, including:

- Pay-for-Performance Regulation (FERC Order 755)
- Demand-side ancillary services
- Shortage pricing
- New A/S product/service development
  - Ramp enhancement
  - Inertia

Following this overview, each of the market concepts will be discussed by market administrators and market participants in ensuing sessions.

9:00 – 10:00 a.m.  Pay-for-Performance Regulation (FERC Order 755): Is It Accomplishing What the Regulators Anticipated?

This panel of ISO/RTO representatives will discuss what is happening in certain organized markets since FERC issued its FERC Order 755 ruling. Some issues to be considered include:

- Do the markets really need this fast response to regulation requirement?
- How can they accurately quantify the need?
- Will less regulation be required for the same system?
- Has it, or will it, result in rapidly expanding opportunities for energy storage and fast regulation technology, as well as demand side energy resources, etc.?
- Can the markets implement the necessary measures to effect the desired outcome of resource selection based on higher ramp characteristics all at once? Or, can this outcome better be achieved through separate, measured, short-term and long-term adjustments?

10:00 – 10:15 a.m.  Morning Break

10:15 – 11:15 a.m.  How Should Demand Side Ancillary Services Participate in the A/S Markets?

This panel of ISO/RTO representatives will discuss the expanding role of demand response, but especially the distinctive elements of demand side resources for ancillary services, which are distinguished from conventional demand response in these ways:

- The resource can be seen and monitored directly in the control room
- Notification time is reduced
- Measurements are provided more rapidly and accurately
- Requirements vary geographically
- The resource is available year ‘round, not just seasonally

11:15 a.m. – 12:15 p.m.  Examining Reserve and Regulation Shortage Pricing

This panel of ISO/RTO representatives will discuss:

- Whether markets should rely on scarcity pricing to assure resource adequacy?
- What price should the system operator be required to pay, and what level of reserves should the system operator maintain during shortage conditions?
- If offer prices should be allowed to set prices during reserve shortages or are caps truly necessary?
- Whether scarcity pricing should be imposed for insufficient ramp capability to meet load and maintain reserves, and if regulation should be differentiated from scarcity pricing imposed for insufficient generation capacity?
- What are the consequences of how each organized A/S market handles reserve shortage conditions?
AGENDA

Wednesday, June 25, 2014 (Continued)

12:15 – 1:30 p.m. Group Luncheon

1:15 – 2:15 p.m. New Ancillary Services Product/Service Developments Capturing the Financial Value of Fast Ramping Capacity Resources

   What technologies support ancillary services’ changing needs? Should products that provide fast response resources be differentiated and incentivized by markets? Should these be considered ancillary services products or something else? Two ISOs that have moved to establish market products for fast ramp and related resource products will discuss why and how they did it, as well as what types of market participants will benefit.

2:15 – 3:00 p.m. Synchronous Inertial Response (SIR) Analysis and Proposal

   The accelerating displacement of synchronous generation in recent years has reduced the grid’s inertial response capability in systems where there is high penetration of wind production and other variable energy resources. ERCOT, in particular, has determined that it will need a primary frequency response (PFR) service to maintain stable frequency and meet NERC standard requirements. The ISO, therefore, is studying how it can implement a market mechanism that will allow it to establish, price and procure this resource to deploy and arrest the decline in system frequency before it drops to an unacceptable level. This session will detail their efforts, and what it could mean for other systems with a high penetration of low inertia energy resources.

3:00 – 3:15 p.m. Afternoon Break

3:15 – 4:15 p.m. Demand Side Ancillary Services — Market Participant Views

   As denoted above, the concept of demand side ancillary services is an evolving concept that brings greater certainty to the application of DR resources as an ancillary service product. Market participants with varying perspectives will express their views as to:
   • How is it developing?
   • What are issues to further development?
   • What resources can satisfy the market requirements?

4:15 – 5:15 p.m. Pay for Performance — Market Participant Views

   Market participants with varying perspectives will express their views regarding the issuance of FERC Order 755 and related market measures, on such questions as:
   • Have the markets responded with the right incentives to create a “new” ancillary services product that provides the fast response resources being targeted?
   • If so, what is it/are they? If not, what should the incentives be?
   • How would an “in-the-money” resource pencil out? Are the financial rewards of participation in the ancillary markets driving power generation product/service development and purchase evaluation criteria?
   • Should the regulation market be split into 2 parts – up and down – in markets other than ERCOT and CAISO?
   • What are some examples of innovation that have been stimulated by FERC Order 755?

“Valuable source to obtain perspective of what others throughout the country are doing.”

– Manager Market Design and Regulatory Policy, CAISO
AGENDA

Thursday, June 26, 2014

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

8:00 – 9:00 a.m.  Alternative Technologies for Providing Regulation

If load growth expands, and/or as environmental regulations crimp traditional baseload output, and/or as technology creates new possibilities, and/or as regulatory agencies impose more stringent mandates, the opportunities for non-generation resources to satisfy A/S needs will surely expand. Until any or all these conditions exist, how do market participants feel about:

• How the market is currently accommodating these resources?
• Should the requirement in CAISO and MISO that an A/S regulation resource deliver continuous energy be relaxed or eliminated?
• How important is it that telemetry be required for regulation and/or spinning reserve?
• What are the co-optimization challenges for responsive loads and storage?

9:00 – 10:00 a.m.  How Will Impending Market Changes Influence A/S Pricing and Bidding?

Market participants with varying perspectives will discuss what they think will occur going forward in A/S markets bidding in response to such power system phenomena as:

• Increasing wind and solar penetration
• Shutdown of coal resources
• Intra-hour (15 min) scheduling

10:00 – 10:15 a.m.  Morning Break

10:15 – 11:15 a.m.  Allocating A/S Costs Based on Cost Causation

As variable and distributed energy resources penetration increases — and distribution systems as well as the grid must adapt in ways that they were not originally intended to — the consequences for market participants may push these lingering questions to the fore. Several market participants will debate whether and how the market might respond regarding:

• Who pays for needed flexi-ramp A/S?
  o Wind resources
  o Solar resources
  o Other VERs
• How should non-conforming loads be assessed?
• Should the largest generator be responsible for margin to second largest generator?

11:15 a.m. – 12:15 p.m.  Should Virtual Trading Be Introduced in the A/S Markets?

In energy, capacity and transmission congestion markets, virtual trading is an accepted market practice. In these markets, virtual trading brings much-needed liquidity. Though the A/S products constitute a much smaller market, is it possible that the introduction of virtual trading could improve the efficiency of the market? If this were to occur, might it lead to market manipulation challenges? This segment will feature a discussion of both the plausibility and desirability of allowing virtual trading in A/S.

12:15 p.m.  Conference Adjourns
PRESENTERS AND PANELISTS

Matthew Barmack, Director of Market and Regulatory Analysis, Calpine Corp.

Joseph Bowring, Market Monitor for PJM and President, Monitoring Analytics

Tim Carter, Director-Products & Services, Constellation New Energy

Dhiman Chatterjee, Senior Manager – Market Design & Delivery, Mid-Continent ISO

Ron Coutu, Manager Business and Technology Solutions, ISO-NE

Susan Covino, Senior Consultant – Emerging Markets, PJM

Jaime Haro, Senior Director – Asset Management & Trading, Ameren Missouri

Scott Harvey, Consultant, FTI Consulting

Chelsea Howard, RTO Resource Specialist, The Energy Authority

Clyde Loutan, Senior Advisor – Renewable Energy Integration, CAISO

Sandip Sharma, Supervisor – Operations Analysis, ERCOT

Resmi Surendren, Manager of Market Analysis, ERCOT

“With an industry like ours – Education needs the same demand response and ramp up capability! So attend!”

– Regional Account Manager, NextStep Electric

“Excellent group of diverse attendees – conference was a great chance to speak to a variety of experts.”

– Economic Value Manager, GE Power & Water
PRE-CONFERENCE WORKSHOP 1:
CRITICAL ELEMENTS OF ANCILLARY SERVICES MARKET DESIGN

OVERVIEW

This workshop will focus on developing an in-depth understanding of four features of ancillary service market design:
1. Co-optimization in the scheduling and dispatch of energy and ancillary services
2. The theory and practice of reserve and regulation shortage pricing
3. The pricing and scheduling of demand side ancillary services
4. Market design approaches to scheduling and pricing ramp capability

WHAT YOU WILL LEARN

- Assess the reasons co-optimization of energy and ancillary services is becoming a standard feature of wholesale power markets and how they function
- Examine the relationship between ramp constraints, regulation shortage prices, price variability, and the returns to being on dispatch...
- Analyze and understand how the development of demand ancillary services is related to the level of price caps and the introduction of meaningful shortage pricing

AGENDA

Tuesday, June 24, 2014
7:30 – 8:00 a.m.  Registration and Continental Breakfast
8:00 – 11:45 a.m.  Workshop Timing
I. Overview of Ancillary Services Pricing
II. Co-optimization of Energy and Ancillary Services
   o Why is co-optimization needed for economic efficiency?
   o How does co-optimization work?
III. Reserve and Regulation Shortage Pricing
   o Overview of alternative scarcity pricing mechanisms
   o The advantages of reserve shortage pricing
   o How does reserve shortage pricing work
   o Determining energy prices in markets with reserves shortage pricing and co-optimized energy and ancillary service markets
   o Ramp constraints, price spikes and regulation shortage values
   o The role of scarcity pricing in markets with capacity requirements
IV. Demand Side Ancillary Services
   o Why utilize demand side ancillary services?
   o Bidding and pricing for demand side ancillary services
   o “Negawatt” pricing and the provision of demand side ancillary services

WORKSHOP INSTRUCTOR

Scott Harvey / Consultant / FTI Consulting
Scott Harvey is a consultant in the Boston office of FTI Consulting. Prior to joining FTI in 2010, he was a consultant for 12 years with LECG and 11 years with Putnam, Hayes and Bartlett, Inc. He has been actively involved at FTI, LECG, and PHB with the restructuring of the PJM, New York and New England Power Pools, the development of the MISO Stage 2 congestion management system, and the development and implementation of the California ISO’s MRTU market design in April 2009. He is currently a member of the Midwest ISO’s market advisory committee, a member of the California ISO’s market surveillance committee and continues to consult for the NYISO on a wide variety of issues.
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PRE-CONFERENCE WORKSHOP 2:
USING CO-OPTIMIZATION TO VALIDATE ISO MARKET AWARDS AND
PRICES, AND MAXIMIZE ASSET PROFITS

OVERVIEW
The goal for this workshop is to discuss strategies for bidding ancillary services (A/S) in ISO markets. The workshop will use simple case studies to explain bidding parameters, methods to quantify both deployment costs and lost-opportunity costs for providing ancillary services, techniques for co-optimizing competing energy and ancillary-service products, methodologies to price ancillary services, and tools to perform settlement.

In the workshop, you will have an opportunity to use a market simulator to submit your energy and ancillary-service offers, test your bidding strategies, clear the market, compute settlement, and determine the bottom-line profit for your generation and load assets. The workshop will discuss the impact of ancillary-service markets on your portfolio-optimization, bidding, and settlement workflows.

LEARNING OUTCOMES
• Discuss how to formulate A/S bids
• Illustrate A/S co-optimization through case studies
• Assess the impact of A/S co-optimization on energy and A/S costs for ISO footprint
• Assess the impact of A/S co-optimization on revenues and profits for market participants

AGENDA
Tuesday, June 24, 2014
12:30 – 1:00 p.m. Registration
1:00 – 5:00 p.m. Workshop Timing
I. Strategies for Bidding Ancillary Services in ISO Markets
   • Quantifying costs for supplying ancillary services (A/S)
   • Quantifying ancillary-service deployment costs and probability of ancillary-service deployment
   • Formulating A/S bids
   • Understanding lost-opportunity costs
   • Benefits for co-optimizing energy and A/S
   • Case studies to illustrate co-optimization
   • Does co-optimization minimize energy and A/S costs for ISO footprint?
   • Does co-optimization maximize revenues and profits for market participants?
   • Can we validate A/S marginal prices published by ISO?
   • Computing revenues and costs for providing ancillary services
   • Does co-optimization produce correct price signals for A/S products?
   • How do A/S requirements affect unit dispatch and LMPs?
   • Are A/S marginal prices influenced by congestion?
   • Can you verify that energy and A/S Awards published by ISO are optimal for your generators?
   • Running case studies to illustrate impacts of various bidding strategies on unit profits and losses
AGENDA

Tuesday, June 24, 2014 (CONTINUED)

II. Running Market Simulation to Evaluate Bidding Strategies
   • Formulating energy and ancillary-service bids
   • Computing revenues and costs for providing energy and ancillary services
   • Case studies illustrating bid-to-bill workflow
   • Forecasting LMPs and ancillary-service prices
   • Computing revenues, costs, and profits and losses for resources and loads
   • Validating market results
   • Running case studies to illustrate impacts of various bidding strategies on plant profits and losses
   • Evaluating impacts of congestion on plant profits and losses

WORKSHOP INSTRUCTORS

Khai Le / Vice President / PCI
Over the past 38 years, Khai Le has conducted some 600 seminars on market-based operations, bidding strategies, portfolio optimization, and shadow settlement for utilities and ISOs worldwide. He is currently working with market participants in MISO, SPP, PJM, CAISO, ERCOT, ISO-NE, and NYISO to deploy the PCI Generation Supply Management System (PCI GenManager, PCI GenTrader and PCI GenPortal) to automate their bid-to-bill workflow. Mr. Le authored more than 100 technical papers on unit commitment, hydro-thermal coordination, emission dispatch, optimization of ancillary services, post analysis, and short-term planning. Five of his papers received prize awards. He received his BS from Harvey Mudd College and his MS from Carnegie Mellon University. He is a Fellow of the IEEE and a Registered Professional Engineer in Pennsylvania.

Tony Delacluyse / Director / PCI
Tony Delacluyse is a well-recognized authority on electric markets. He has more than 28 years of experience that includes power plant operations, origination, pricing, deregulated retail, settlements, RTO/ISO operations. After joining PCI in 2005, Mr. Delacluyse managed the PCI team to develop back-office software for MISO, SPP, ERCOT, CAISO and PJM markets. He participates in RTO/ISO market meetings, monitors the industry and FERC for market impacts and works with markets participants on planning, software, and strategy. He received both his BA and MBA from St Ambrose University.

Ken Lukowski / Project Manager / PCI
Ken Lukowski manages the deployment of the PCI GSMS suite for market participants in MISO, SPP, and PJM. He has more than seven years of settlements experience. He is very active in the MISO Market Settlements Working group. Mr. Lukowski received his BS in Accountancy & Finance from Southern Illinois University and his MBA from Lindenwood University.

Steve Terelmes / Senior Manager / PCI
Steve Terelmes has more than 15 years of experience in the energy industry. At PCI, he is responsible for Market Monitoring, Project Management, and Customer Training. As a subject matter expert in energy markets, Mr. Terelmes has experience managing both regulated and non-regulated generation assets. He has been involved in almost all facets of market activity, including generation trading, congestion management, corporate planning, market integration, bidding strategies, and market settlements. He received his MBA from Washington University.
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INSTRUCTIONAL METHODS

PowerPoint Presentations, Case Studies, and Workshop Exercises will be used in the program.

REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

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 approved as an Authorized Provider by the International Association for Continuing Education and Training (IACET), 1760 Old Meadow Road, Suite 500, McLean, VA 22102. In obtaining this approval, EUCI has demonstrated that it complies with the ANSI/IACET Standards, which are widely recognized as standards of good practice internationally.

As a result of its Authorized Provider membership status, EUCI is authorized to offer IACET CEUs for its programs that qualify under the ANSI/IACET Standards.

EUCI is authorized by IACET to offer 1.1 CEUs for the conference and 0.4 CEUs for each workshop

CPE CREDITS

EUCI is registered with the National Association of State Boards of Accountancy (NASBA) as a sponsor of continuing professional education on the National Registry of CPE Sponsors. State boards of accountancy have final authority on the acceptance of individual courses for CPE credit. Complaints regarding registered sponsors may be addressed to:

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Web site: www.nasba.org

CPE CREDITS

Upon successful completion of this event, program participants interested in receiving CPE credits will receive a certificate of completion.

Ancillary Services Markets conference CPE Credits: 12.5,
workshop I CPE Credits: 4, workshop II CPE credits 4.

There is no prerequisite for this conference or related workshops.

Program Level 1: Beginner and Intermediate
Delivery Method: Group Live
Advanced Preparation: None
EVENT LOCATION

A room block has been reserved at the Loews Philadelphia Hotel, 1200 Market St., Philadelphia, PA 19107, for the nights of June 23-25, 2014. Room rates are $209, plus applicable tax. Call 1-215-627-1200 for reservations and mention the EUCI program to get the group rate. The cutoff date to receive the group rate is May 23, 2014, but as there are a limited number of rooms available at this rate, the room block may close sooner. Please make your reservations early.

About the location:
The first skyscraper ever built in the City of Brotherly Love is home to Loews Philadelphia Hotel. Contemporary décor and gracious hospitality make Loews Philadelphia one of Center City’s most inviting luxury hotels, recognized as one of the “World’s Best” by Travel + Leisure readers.

Located in the heart of the city with the famous PSFS sign still illuminating the Philadelphia skyline, Loews Philadelphia Hotel is perfectly situated so you can take advantage of everything this city has to offer.

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, flash drives are available two weeks after the conference is complete. The cost per flash drive is US $395 (add US $50 for international shipments). Flash drives include visual presentations only. Upon receipt of order and payment, the flash drive will be shipped to you via regular USPS mail.

NOTE: All presentation flash drive sales are final and are nonrefundable.

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
• Workshop sponsor
• Reception host
• Lanyard sponsor
• Networking break host
• Luncheon host
• Tabletop exhibit
• Breakfast host

Custom sponsorship opportunities are also available.

For more information

Please contact Stephen Coury at 303-988-1228 or scoury@euci.com.
Please register the following credit card discounted registration for attending ancillary services markets conference and both pre-conference workshops I and II JUNE 24-26, 2014: US $2195 Early bird on or before June 13, 2014: US $1995 ancillary services markets conference only JUNE 25-26, 2014: US $1395 Early bird on or before June 13, 2014: US $1195 add individual workshop to conference

- Pre-conference workshop (I), June 24, 2014 (morning session): US $400
- Pre-conference workshop (II), June 24, 2014 (afternoon session): US $400

Individual workshop only

- Pre-conference workshop (I), June 24, 2014 (morning session): US $595 Early bird on or before June 13, 2014 US $495
- Pre-conference workshop (II), June 24, 2014 (afternoon session): US $595 Early bird on or before June 13, 2014 US $495

I’m sorry I cannot attend, but please send me the conference proceedings for US $395. (Please add $50 for international shipping.)

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