ELECTRICITY MARKET PRICE FORMATION AND FORECASTING MECHANICS: Maximizing value under multiple market conditions and for different products

September 27 – 28, 2017
Sheraton Denver Tech Center
Denver, CO
OVERVIEW

The aim of this course is to explain how electricity is priced at the wholesale level, and give some guidance about forecasting prices – with or without sophisticated modeling tools – as well as consider the implications this price forecasting knowledge can have on market participants’ operational and trading conventions.

Electrical energy is a unique commodity because it cannot be efficiently stored in large quantities. Rather, it must be produced and delivered on demand without interruption, it is produced by conversion of energy from various other forms and it is delivered across a network in accordance with the laws of physics. These characteristics account for the complexity of supplying electrical energy around the clock. That complexity is reflected in the volatility of the price (value at each location in a given time interval) and hence the difficulty of forecasting electricity prices. Consequently, anyone who deals with current and future prices will benefit from a deeper understanding of what drives them.

This course will explain the basics of electric energy supply and demand, the problems to be solved by the System Operator to ensure economic and reliable supply at all times, and how this balancing act translates into the determination of wholesale electricity prices. Attendees will gain a practical understanding of price formation elements and an introduction to approaches to forecasting electricity prices in the short term (for traders and generation schedulers) and long-term (investors and project developers). The value and usage of price forecasts will be explored. Emphasis will be placed on describing U.S. locational marginal pricing (LMP) style markets. Going beyond the traditional three-bus LMP example, attendees will learn how the market forms prices in the real world. A discussion of price forecasting methods will give attendees insight into future prices, even without the use of sophisticated modeling tools. Several approaches to price forecasting will be presented, with concentration on fundamentals-based modeling. Finally, the course will explore uses of price forecasts for physical and financial trading, daily generation bidding, power purchase agreement (PPA) negotiation, congestion hedging (FTR) and investment in transmission and generation projects.

LEARNING OUTCOMES

Using real-world situations and illustrative examples, this instructional course will:

• Explain why there are “day ahead” (DA) and “real time” (RT) markets
• Assess the mechanics of unit commitment – how the market chooses which suppliers to buy from
• Explain the mechanics of economic dispatch – how the market decides how much to buy from each supplier
• Identify how different resources are offered into the markets
• Examine the fundamental drivers of electricity prices (supply, demand, transmission network)
• Illustrate locational marginal price (LMP) formation with examples
• Review the value and use of price forecasts for multiple market conditions and products
• Survey statistical methods and neural networks for short-term forecasting
• Review fundamentals-based forecasting (market mimicking) for short and long-term
WHO SHOULD ATTEND

Representative Organizations
- Independent power producers (IPPs)
- Load-serving entities (LSEs) and utilities
- Local distribution companies (LDCs)
- Merchant power ventures
- Merchant transmission providers
- Wholesale trading companies
- Power marketers
- Energy service providers/companies (ESPs/ESCOs)
- Smart grid resource providers
- Demand response providers/aggregators
- Large energy customers
- Consumer advocates
- Regulatory counsel
- State regulatory staff

Responsibilities
- Generation bidding
- Scheduling
- Asset management
- Marketing and business development
- Financial marketers
- Power trading
- Power supply analyst
- Contract administrators and analysts
- Energy management
- Revenue assurance
- Energy operations and supply
- Retail load supply
- Structured power
- Bulk power
- Energy finance and analysis
- Confirmation administration
- Procurement management

INSTRUCTOR

Nicholas Pratley

Nicholas Pratley has 30 years of experience in power systems engineering and analysis, including 12 years simulating wholesale power markets in the U.S., Canada and Europe. His clients have included transmission owners, municipal utilities, electric co-ops, generation developers and power traders. He holds bachelor’s and master’s degrees in Electrical Engineering from McGill University and the University of Montreal.
AGENDA

WEDNESDAY, SEPTEMBER 27, 2017

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

8:30 – 9:15 am  Electricity Supply, Demand and Transmission Market Basics
  • Day-ahead (DA) markets
  • Real-time (RT) markets
  • Congestion hedging and virtual trading

9:15 am – 10:15 am  Defining the Problems to be Solved
  • Demand forecasting
  • Unit commitment
  • Economic dispatch
  • Operating reserves
  • Power flow

10:15 – 10:30 am  Morning Break

10:30 am – 12:00 pm  Locational Marginal Prices
  • Marginal energy
  • Marginal loss
  • Marginal congestion
  • Shift factors
  • Shadow prices

12:00 – 1:00 pm  Group Luncheon

1:00 – 2:30 pm  Real World Examples
  • CAISO
  • MISO
  • SPP
  • ISO-NE
  • NYISO

2:30 – 3:00 pm  Networking Break

3:00 – 4:45 pm  Worked Examples
  • Energy and reserves
  • Dispatch accounting for losses
  • Transmission congestion
  • Security constraints (“N-1” versus “N-0”, “flowgates”)
AGENDA

THURSDAY, SEPTEMBER 28, 2017

8:00 – 8:30 am  Continental Breakfast

8:30 – 10:15 am  Worked Examples
• Price spikes and negative prices
• Virtual bids and offers
• Impact of new transmission build (example: public policy transmission)
• Impact of fuel price (e.g., natural gas)
• Impact of carbon tax
• Impact of high renewable energy penetration

10:15 – 10:30 am  Morning Break

10:30 am – 12:00 pm  Value and Uses of Price Forecasts
• Generation bidding by resource type (hydro, coal, combined-cycle, peaker, renewable)
• Trading (physical, virtual, speculative)
• Financial transmission rights (FTRs)
• PPA negotiation
• Long-term investment (generation and transmission projects)
• Generation retirement

12:00 – 1:00 pm  Group Luncheon

1:00 – 2:00 pm  Statistical and Neural Networks for Short- and Long-term Forecast Models
• Historical market data
• Regression
• ARIMA –type models
• ANN

2:00 – 2:30 pm  Input Data for Fundamental Modeling
• Demand
• Transmission network model
• Cost curves (heat rate)
• Fuel prices
• Transmission constraints

2:30 – 3:30 pm  Real-world Case Studies

3:30 pm  Course Adjourns
INSTRUCTIONAL METHODS
PowerPoint presentations and test cases will be used to present course information.

REQUIREMENTS FOR SUCCESSFUL COMPLETION
Participants must sign in/out each day and be in attendance for the entirety of the course 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 1.2 CEUs for the course

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 submitted to the National Registry of CPE Sponsors through its website: www.learningmarket.org.

Upon successful completion of this event, program participants interested in receiving CPE credits will receive a certificate of completion. EUCI is authorized by CPE to offer 14.0 credits for this course. There is no prerequisite for this course. Program Level 1: Beginner and Intermediate, Delivery Method: Group-Live, Advanced Preparation: None

EVENT LOCATION
A room block has been reserved at the Sheraton Denver Tech Center, 7007 S Clinton St, Greenwood Village, CO 80112, for the nights of September 26 – 28, 2017. Room rates are $149 plus applicable tax. Call 1-303-799-6200 or click here for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is September 12, 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 course may send 1 FREE for every 3 delegates registered. Please note that all registrations must be made at the same time to qualify.
Please register

Electricity Market Price Formation and Forecasting Mechanics Course:
September 27–28, 2017 | Denver, CO: US $1495
Early bird on or before September 8, 2017: US $1295

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

Exp. Date

Billing State

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 August 25, 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 303-770-8800.

EUCI reserves the right to alter this program without prior notice.