

LONG TERM LOAD FORECASTING IN MS EXCEL

August 14 – 15, 2018
Millennium Knickerbocker Hotel Chicago
Chicago, IL



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OVERVIEW

Load forecasting is a fundamental element in utility business operations and planning processes. During the past 120-plus years, load forecasting methodologies have evolved as the industry and related technologies advanced. Consequently, many classical methods are no longer suitable in addressing today's challenges in the utility industry.

This course offers a comprehensive and in-depth treatment to long-term load forecasting. The content includes:

- A review of the fundamental concepts and classical methods
- A statistical approach that leverages high resolution data and modern computing power
- Probabilistic forecasting that helps better quantify the uncertainties of the unpredictable future
- Several advanced and emerging challenges triggered by big data
- Renewable energy integration and demand side management programs

This course brings the long-term load forecasting methodologies to the most widely-used business forecasting tool, spreadsheets. It starts with an overview of various options available in the market, and then zooms into spreadsheet operations. We will demonstrate four different ways of doing forecasting in spreadsheets, and help the participants understand the limitations of each. The participants will gain hands-on experience with building models and generating load forecasts in spreadsheets, while competing and collaborating with others. Real-world examples and case studies are embedded throughout the course when introducing the theories and methodologies.

This will be a working session. Each participant should bring a laptop with MS Excel 2007 (or newer versions) with add-ins of Solver and Data Analysis.

This is an intermediate course. Individuals not having experience in forecasting should consider attending the preceding July program on Fundamentals.

LEARNING OUTCOMES

Attendees will cover materials and engage in discussions that will allow them to:

- Review the fundamental concepts of load forecasting
- Recognize the evolution of classical load forecasting methods
- Prepare and build regression models with hourly data
- Build and conduct ex post forecasting to analyze the source of errors
- Evaluate point and probabilistic load forecasts
- Apply and conduct what-if analysis
- Employ and conduct weather normalization
- Evaluate the distribution of forecast errors
- Manage how to perform data cleansing
- Discuss emerging topics and the applicable problem-solving principles

WHO SHOULD ATTEND

Utility planning, economic and finance personnel working in the following areas will derive benefits in attending:

- Load forecasting
- Integrated resource planning
- Generation planning
- Transmission & distribution planning
- Demand side management (DSM), demand response (DR) and energy efficiency (EE)
- Rate design
- Financial
- Operations
- Strategy
- Risk management
- Statisticians
- Economists
- Analysts
- Energy trading

AGENDA

TUESDAY, AUGUST 14, 2018

- 8:00 – 8:30 am** **Registration and Continental Breakfast**
- 8:30 – 10:15 am** **Introduction to Long-Term Load Forecasting**
- Utility applications
 - o Uses
 - o Users
 - How much is 1% error?
 - Principles of forecasting
 - Load forecasting terminologies
 - Exercise: calculating error measures
- 10:15 – 10:30 am** **Morning Break**
- 10:30 am – 12:00 pm** **Evolution of Classical Methods**
- The magic ruler
 - Regression models with monthly or daily data
 - S-curve and spatial load forecasting
 - End use studies
- 12:00 – 1:15 pm** **Group Luncheon**
- 1:15 – 3:00 pm** **A Statistical Approach**
- Golden insights from hourly data
 - Polynomials or piecewise functions?
 - A large but small model
 - Is it economists' fault?
- 3:00 – 3:30 pm** **Networking Break**
- 3:30 – 5:00 pm** **Exercise: Load Forecasting with Hourly Data**
- 5:00 pm** **Course Adjourns for the Day**



“Paving for the Future — long term energy load forecasting”

Senior Forecasting Specialist, Dairyland Power Coop



“I was very pleased with the information conveyed in this course. The multitude of data that can improve a load forecast and how to implement them was eye-opening.”

Sr. Engineer-Delivery System Planning, Alliant Energy

AGENDA

WEDNESDAY, AUGUST 15, 2018

- 8:00 – 8:30 am** **Continental Breakfast**
- 8:30 – 10:00 am** **Probabilistic Load Forecasting**
- Evaluation methods
 - Exercise: calculating pinball loss
 - Scenario analysis
 - Exercise: scenario-based probabilistic load forecasting
- 10:00 – 10:15 am** **Morning Break**
- 10:15 – 11:00 am** **Probabilistic Load Forecasting (Continued)**
- Load normalization against weather
 - Exercise: probabilistic load forecasting and normalization
- 11:00 – 11:45 am** **Challenges and Emerging Topics**
- Data, data, data
 - Distributed generation
 - Energy efficiency and demand response
 - Electric vehicles
 - Forecast override, override what, and how?
- 11:45 am** **Course Adjourns**

INSTRUCTOR



Tao Hong

Director of BigDEAL (Big Data Energy Analytics Laboratory), University of North Carolina at Charlotte and Chief Data Scientist, Hong Analytics

Dr. Tao Hong is the Director of BigDEAL (Big Data Energy Analytics Laboratory) at University of North Carolina at Charlotte and Chief Data Scientist of Hong Analytics. He has been providing training and consulting services to more than 100 organizations in the energy industry worldwide. He is the Founding Chair of IEEE Working Group on Energy Forecasting, General Chair of Global Energy Forecasting Competition, lead author of the online book *Electric Load Forecasting: Fundamentals and Best Practices*, and author of the blog *Energy Forecasting*. Dr. Hong received his B.Eng. in Automation from Tsinghua University in Beijing and his PhD with co-majors in Operations Research and Electrical Engineering from North Carolina State University.



“Dr. Hong’s knowledge on the subject along with his ability to divulge and present the material in an understandable format makes the course invaluable to forecasters.”

Manager of System Planning & Standards, PRECorp

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.

INSTRUCTIONAL METHODS

PowerPoint presentations, case studies, and workshop exercises will be used in this program.

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 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 11.0 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 Millennium Knickerbocker Hotel Chicago, 163 E Walton Pl, Chicago, IL 60611, for the nights of August 13-14, 2018. Room rates are \$169 plus applicable tax. Call **1-312-751-8100** or [click here](#) for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is July 13, 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.**

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.

REGISTRATION
to register [CLICK HERE](#) or

Call: 201 871 0474
fax: 253 663 7224
email: 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 SELECT

- LONG TERM LOAD FORECASTING
IN MS EXCEL COURSE**
 AUGUST 14 – 15, 2018: US \$1495
 Early bird on or before July 27, 2018: 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?

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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 July 13, 2018 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 EUCL 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, EUCL'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.