EUCI COURSE

# ENERGY FORECASTING FUNDAMENTALS FOR UTILITY/ POWER INDUSTRY PROFESSIONALS

**June 6 – 7, 2017**
**The Hotel Minneapolis, Autograph Collection**
**Minneapolis, MN**

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

# OVERVIEW

Utilities and other power organizations nowadays are caught in a crossfire of patterns and trends that often run counter to what seemed incontrovertible fact just a few years ago. Other perplexing conditions are present, also, that seem difficult to gauge – changes in the mix of supply and demand side resources, the impact of technology on the grid and access it allows to system and customer data, dramatic shifts in commodity prices, the emergence of intermittent and variable resources, flat to declining load growth, and so on.

The problem is largely due to the inaccurate, unexplainable and indefensible forecasts generated from the forecasting practices in the pre-computer era. Trend analysis and other traditional methodologies cannot properly capture these unstable conditions. Thankfully, though, new forecasting methods have been developed that take account of behavioral and technological changes affecting electricity use.

This course offers an introduction to forecasting principles, practices, and their applications in the utility industry, such as demand forecasting, renewable generation forecasting, and price forecasting – the essential tools for making sense of today's power environment and delivering proper guidance for industry decision-makers. It will be loaded with examples and illustrations that translate these methodologies into the corollary utility practices.

# LEARNING OUTCOMES

- Examine and review the concept of predictability
- Recognize how to describe a forecasting process using formal and rigorous terminologies
- Identify the basic forecasting concepts, such as signal and noise
- Recognize the practical value of forecast combination
- Apply diffusion of innovation principle in long term forecasting
- Discuss the do's and don'ts in judgmental forecasting
- Relate how to evaluate forecasts and forecasting systems
- Distinguish the pros and cons of commonly used univariate models, multivariate models and machine learning techniques
- Define the general methodologies for short-term and long-term electric load forecasting, gas demand forecasting, wind and solar power forecasting, and gas and electricity price forecasting

# AGENDA

TUESDAY, JUNE 6, 2017

**12:30 – 1:00 pm** **Registration**

**1:00 – 3:00 pm** **Forecasting Principles**
- Predictable or not?
- Forecasting terminologies
- Signal, noise and tradeoff
- Forecast combination
- Diffusion of innovation
- Judgmental forecasting

**3:00 – 3:15 pm** **Morning Break**

**3:15 – 5:00 pm** **Forecasting Practices**
- Forecast evaluation
- Univariate models
- Multivariate models
- Machine learning techniques

**5:00 pm** **Course Adjourns for the Day**

> ***"The course content is utility related and practical, and is easily transferable to everyday working practices."***
>
> T & D Manager, NEVLEC

> ***"All forecasts are wrong, but Dr. Hong's class helped us understand how to improve our practices."***
>
> Power Supply Economist, PLM Inc

# AGENDA

WEDNESDAY, JUNE 7, 2017

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|---|---|
| **8:00 – 8:30 am** | **Continental Breakfast** |
| **8:30 – 10:15 am** | **Electricity Demand Forecasting**<br>• Driving factors<br>• Short-term load forecasting<br>• Long-term load forecasting |
| **10:15 – 10:45 am** | **Networking Break** |
| **10:45 – 11:30 pm** | **Gas Demand Forecasting**<br>• Driving factors<br>• Methodologies |
| **11:30 am – 12:15 pm** | **Demonstration** |
| **12:15 – 1:30 pm** | **Group Luncheon** |
| **1:30 – 3:00 pm** | **Renewable Generation Forecasting**<br>• Wind power forecasting<br>• Solar power forecasting |
| **3:00 – 3:15 pm** | **Afternoon Break** |
| **3:15 – 4:30 pm** | **Price Forecasting**<br>• Gas price forecasting<br>• Electricity price forecasting |
| **4:30 – 4:45 pm** | **Summary** |
| **4:45 pm** | **Adjournment** |

# INSTRUCTOR

## Tao Hong

**Director of BigDEAL (Big Data Energy Analytics Laboratory),**
**University of North Carolina at Charlotte**

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.

# REQUIREMENTS FOR SUCCESSFUL COMPLETION OF PROGRAM

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.

# EVENT LOCATION

A room block has been reserved at the The Hotel Minneapolis, Autograph Collection, 215 S 4th St, Minneapolis, MN 55401, for the nights of June 4-8, 2017. Room rates are $229, plus applicable tax. Call **1-612-340-2000** for reservations and mention the EUCI event to get the group rate. The cutoff date to receive the group rate is May 4, 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.***

# 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.

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# 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 make checks payable to: "PMA"

# PLEASE REGISTER

○ **<u>BOTH</u> ENERGY FORECASTING FUNDAMENTALS FOR UTILITY/POWER INDUSTRY PROFESSIONALS AND LONG TERM LOAD FORECASTING COURSES**
JUNE 6 – 9, 2017: MINNEAPOLIS, MN: US $2495
Early bird on or before May 19, 2017: US $2295

○ **ENERGY FORECASTING FUNDAMENTALS FOR UTILITY/ POWER INDUSTRY PROFESSIONALS COURSE**
JUNE 6 – 7, 2017: MINNEAPOLIS, MN: US $1495
Early bird on or before May 19, 2017: US $1295

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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 | Account Number

Billing Address | Billing City | Billing State

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

**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 May 5, 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, contact our offices at (201) 871-0474.