

2018 FORECASTING WORKSHOP

ST. PAUL, MN

DAY ONE
TUESDAY
June 19

7:00 AM - 8:00 AM

Applying Meteorology in Power System Planning and Operations

June 19 - 21, 2018
Saint Paul Hotel



Registration & Breakfast

Location: **Summit Room**

8:00 AM - 12:00 PM

Tutorial

Location: **Promenade Ballroom**

Incorporating Variable Generation Forecasts into Power System Operational Procedures - Where is it Applicable? - A Market Operations Tutorial for Everyone

Chairs: **Erik Ela** and **Aidan Tuohy**, EPRI

Description:

Are you someone who would like to better understand how the current day-ahead and real-time scheduling process with security constrained unit commitment (SCUC) and security constrained economic dispatch (SCED) work in the presence of a large share of variable generation (VG)? Would you like to know what progress is being made in the incorporation of uncertainty forecast information into scheduling processes? Or why there is a difference in the use of forecasts in the day ahead market and the reliability unit commitment? Or how FERC Order 841 on the incorporation of energy storage resources into the markets will affect the value proposition for VG forecasting? What about how forecasting other information can be used in similar ways to achieve reliability and economic efficiency?

Would you like to know where to look when focusing on forecast value in the future? Will private market participants be able to find improved value in uncertainty forecasting with the incorporation of energy storage into the markets, either in isolation or in aggregation with VG? We've been searching for the value of improved forecasting through use of uncertainty information in commitment and dispatch and reserves for years now. Is

this a breakthrough moment? Will system operators operate storage resources differently with better forecasts? Will market participants find increased value in better forecasts for managing their storage assets and optimizing their combined “storage+VG” products? This tutorial topic will be complementary to Session 3 of the workshop, Integration of Probabilistic Forecasts into the EMS and MMS – Status and Prospects. The tutorial will give a better understanding of how the processes which will be described and discussed in Session 3, are working and might evolve.

Speakers will focus both on how they use forecasts now, and where there may be opportunity to do something different, as we have more VER on the system and also more capabilities to use the uncertainty in decision making. If you would like help in better understanding this whole process, then you need to participate in this tutorial and workshop.

Day Ahead and Real Time Operations – A US ISO Point of View
Daniel Harless, SPP

Day Ahead and Real Time Operations – A European Point of View
Rui Pestana, REN, Portugal

Day Ahead and Real Time Operations – A US Large Utility Point of View
Kari Hassler, Xcel Energy

The Impacts of Variable Generation Forecasting in Determining Reserve Needs and Value
Nick Steffan and **Sean Chang**, ERCOT

Natural Gas System Forecasting Status and Coordination Opportunities
Mike Knowland, ISO-NE

The Changing Needs of Power System Forecasting on the Evolving Power Grid
Erik Ela, EPRI

10:00 AM - 10:30 AM

Break

Location: **Foyer**

12:00 PM - 1:00 PM

Lunch

Location: **Summit Room**

1:00 PM - 2:00 PM

ESI Forecasting Workshop Welcome & Opening Session

Location: **Promenade Ballroom**

Local Welcome
Michael Noble, Executive Director, Fresh Energy

Opening Remarks
Mark Ahlstrom, President, ESIG Board

Keynote Comments
Improved Forecast Value from Energy Systems Integration Applications
Mark Ahlstrom, President, ESIG Board

Meeting Overview
Charlie Smith, Executive Director, ESIG

2:00 PM - 3:45 PM

Session 1 - Opening Plenary - Meteorology, Climate and the Electric Sector - Forecasting for an Integrated Energy System

Chair: **Sue Haupt**, NCAR

Location: **Promenade Ballroom**

Global Impacts of Climate Change on Renewable Energy
Alberto Troccoli, World Energy and Meteorology Council

Climate Model Insights on Future Wind Resource
Julie Lundquist, UC Boulder

Impact of Climate Change on Forecasts
Jeff Freedman, SUNY Albany

Opportunities for Improved Coordination between Meteorology and Operations
David Schweizer, PJM

3:45 PM - 4:00 PM

Break

Location: **Foyer**

4:00 PM - 5:30 PM

Session 2 - Solar and Wind R&D Advances

Chair: **Justin Sharp**, Sharply Focused

Location: **Promenade Ballroom**

Overview of DOE Solar Forecasting II FOA
Tassos Golnas, DOE

Topic Area 1, Solar Forecasting Performance Framework
Will Holmgren, U of Arizona

Use of Additional Sensors to Improve Solar and Wind Forecasts
Aidan Tuohy, EPRI

Extending Fleet Forecasting Capability into the Probabilistic Realm
Tom Hoff, Clean Power Research

Wind Forecasting Improvement Project 2 – Conclusions and Recommendations
Melinda Marquis, NOAA and **Jim McCaa**, Vaisala

6:30 PM - 8:00 PM

Reception

Location: **M Street Café**

DAY TWO
Wednesday
June 20

7:00 AM - 8:00 AM

Registration & Breakfast

Location: **Summit Room**

8:00 AM - 10:00 AM

Session 3 - Integration of Probabilistic Forecasts into the EMS and MMS – Status and Prospects

Chair: **Bob Zavadil**, EnerNex

Location: **Promenade Ballroom**

Sankaran Rajagopal, Siemens
Amber Motley, CAISO

30 minutes

Drew Gray, GE
Tim Miller, SPP

30 minutes

Khosrow Moslehi, ABB
Dave Edelson, NYISO

30 minutes

Discussion

30 minutes

10:00 AM - 10:30 AM

Break

Location: **Foyer**

10:30 AM - 12:00 PM

Session 4 - Integration and Use of Solar Forecasts for Operating Storage Systems, Distribution Systems and Real Time Markets

Chair: **Mark Ahlstrom**, NextEra Energy

Location: **Promenade Ballroom**

One-Minute Forecasts for Distributed Solar/Storage Applications

Agata Swierc, Clean Power Research

Operational Forecasting Implications of Integrated Wind, Solar and Energy Storage

Daniel Kirk-Davidoff, AWS/UL

Distributed PV Forecasting and Data Marketplace in an Era of Data Privacy Concerns

Ricardo Bessa, INESC TEC, Portugal

Distributed PV Forecasting, Load Forecasting and System Operations

John Simonelli, ISO-NE

12:00 PM - 1:00 PM

Lunch

Location: **Summit Room**

1:00 PM - 2:45 PM

Session 5 - VG Forecasting and Market Operation Experience

Chair: **Alain Forcione**, IREQ

Location: **Promenade Ballroom**

Market Design Evolution and Forecast Integration in EirGrid

Karen O'Doherty, EirGrid Group

Evolution of Spanish Wind and Solar Plant Forecasting and
Market Operation

Mayte Garcia, REE

Market Design Evolution and Forecasting Integration in the AESO

Jacques Duchesne, AESO

ERCOT Wind and Solar Forecasting Developments – Status and Prospects

Pengwei Du, ERCOT

Wind and Solar Forecasting in Portugal – Status and Prospects

Rui Pestana, R&D Nester

2:45 PM - 3:15 PM

Break

Location: **Foyer**

3:15 PM - 5:00 PM

Session 6 - VG Forecasting and Market Operation Advances

Chair: **Craig Collier**, DNV/GL

Location: **Promenade Ballroom**

Wind and Solar Forecasting and Market Integration in Germany
– Status and Prospects

Ulrich Focken, Energy and Meteo

NOAA High Resolution Rapid Refresh (HRRR) Forecasting Model Updates
and Application

Stan Benjamin, NOAA

Forecasting for an Integrated Energy System

Conor Sweeney, UC Dublin

Turbine Specific Wind Forecasting in SPP

Gunnar Shaffer, SPP

Turbine-level vs. Farm-level Data and Temperature Effects on Wind
Generation Power Conversion

Drake Bartlett, Xcel Energy

DAY THREE
THURSDAY
June 21

7:00 AM - 8:00 AM

Registration & Breakfast

Location: **Summit Room**

8:00 AM - 9:45 AM

Session 7 - Advances in Forecast Applications and Market Design

Chair: **Erik Ela**, EPRI

Location: **Promenade Ballroom**

CAISO Proposed Day-Ahead Market with 15 Minute Resolution – Why This Is Good for Renewables

Amber Motley, CAISO

How Might Nowcasting Impact Market Rules – What’s Happening in MISO

Blagoy Borissov, MISO

Use of Uncertainty Information in Grid Management: A High-Speed Shutdown Warning System in Ireland

Corinna Möhrten, WEPROG

Use of Real Time PV Plant Output Data for Solar Forecasting

Nick Engerer, Australian National University

Wind and Solar Data Sets for the North American Renewable Integration Study (NARIS)

Josh Novacheck, NREL

9:45 AM - 10:15 AM

Break

Location: **Foyer**

10:15 AM - 12:00 PM

Session 8 - Closing Plenary – Joint Session with IEA Wind Task 36 on Forecasting for Wind Energy

Chair: **John Zack**, AWS Truepower

Location: **Promenade Ballroom**

A Short Introduction to IEA Wind Task 36

Gregor Giebel, DTU, Denmark

Introduction to the Forecasting Segment of the Massive Open Online Course (MOOC) at Glasgow University

Corinna Möhrten, WEPROG

Update on IEC SC 8A WG 2 Forecasting Activity

Aidan Tuohy, EPRI

Briefing on WP3: Establishing Standards for Understanding the Applicability of Uncertainty Forecasts in the Electric Power Industry

Bri-Mathias Hodge, NREL

(Continued)

Briefing on WP2: Recommended Practice on Forecast Solution Selection and Forecasting Trials

Jeff Lerner, Vaisala

Review and Discussion on Topics for the IEA Wind Task 36 from 2019-2021

Gregor Giebel, DTU, Denmark

12:00 PM - 12:30 PM

Open Mic & Closing Remarks

Charlie Smith, ESIG