



2022 METEOROLOGY & MARKET DESIGN FOR GRID SERVICES WORKSHOP

June 6-9, 2022

The Curtis Denver – Denver, Colorado

PROGRAM AGENDA

Monday, June 6, 2022

NREL Flatirons Campus Tour (12:45 - 5:00 p.m.)

The tour will include the ARIES grid simulation facility along with basic overviews of the wind turbines, PV arrays, CoMet (blade manufacturing), structural testing, dynamometers, the controllable grid interface and integrated energy systems. There are only 20 spots available for this tour. If you are interested, please register immediately.

Also, any foreign nationals interested in attending, should contact Ryan Willis (ryan@esig.energy) by **Thursday, May 5**.

Registration for the tour closes **Friday, May 20**.

The cost per attendee is \$75.

- 12:45 p.m. - Meet in lobby of Curtis Hotel to board bus
- 1:00 p.m. - Depart Curtis Hotel for NREL Flatirons Campus
- 2:00 p.m. – Begin NREL Flatirons Campus Tour
- 4:00 p.m. – Depart NREL Flatirons Campus for Curtis Hotel
- 5:00 p.m. – Arrival at Curtis Hotel

Tuesday, June 7, 2022

8:00 a.m. – 9:00 a.m.

Registration & Breakfast

Location: Four Square Ballroom (3rd Floor)

9:00 a.m. – 12:00 p.m.

Tutorial: Forecasting for Energy and Ancillary Service Markets: Role of Storage, Hybrids and DER in an Uncertain Environment

Co-chairs: **Aidan Tuohy**, Program Manager, EPRI; **Erik Ela**, Principal, EPRI

Location: Marco Polo Ballroom (3rd Floor)

Session Introduction & “How Forecasting Aligns with Operations”

Aidan Tuohy, Program Manager, EPRI (25 mins)

Market Operations Overview and Role of storage, Hybrids and DER
Erik Ela, Principal, EPRI (50 mins)

Q&A (15 mins)

Break (15 mins)

Panel session (15 mins each)

- US ISO view
- US utility/ISO view
- European/Australian TSO view
- Researcher view

Discussion (30 mins)

12:00 p.m. – 1:00 p.m.

Lunch

Location: Four Square Ballroom (3rd Floor)

1:00 p.m. – 3:00 p.m.

Session 1: Introduction and Opening Plenary: The Increasing Ubiquity of VRE Forecasting

Chair: **Mark Ahlstrom**, President, ESIG Board of Directors, & NextEra Energy Resources

Location: Marco Polo Ballroom (3rd Floor)

Welcome

Mark Ahlstrom, President, ESIG Board of Directors

Introduction

Charlie Smith, Executive Director, ESIG

Forecasting and Market Participation for VPPs

Lars Rohwer, energy & meteo systems (Germany)

Forecasting and Market Participation for Hybrids

Gary Dorris, CEO & Co-founder, Ascend Analytics

Forecasting and Market Participation for Large Wind and Solar Power Plants

Congcong Wang, Lead Day-Ahead Market and Reliability Commitment, MISO

DER Technology Forecasting – How will it Impact the Rest of the System?

Nate Blair, Group Manager - Distributed Systems and Storage Analysis, NREL

How are Forecasts Performing and Markets Adapting

Pascal Storck, Head of Technology, Vaisala

3:00 p.m. – 3:15 p.m.

Break

Location: 3rd Floor Foyer

3:15 p.m. – 5:15 p.m.

Session 2: Solar and Wind Forecasting R&D Advances

Location: Marco Polo Ballroom (3rd Floor)

Session 2A: 3:15 pm – 4:15 pm

Chair: **Craig Collier**, Chief Meteorologist, Head of Operations, Energy Forecasting Solutions, LLC

Short and Medium Range Forecasting System Improvements

Dave Turner, Manager - NOAA ASRE Program, NOAA

Dispatching Long Duration Storage on High PV Systems

Brady Cowiestoll, Engineer, NREL

Advances in PV Nowcasting Applications

Nick Engerer, CTO & Co-founder, Solcast (Australia)

Session 2B: 4:15pm – 5:15 pm

Chair: **Tassos Golnas**, Technology Manager, Solar Energy Technologies Office, DOE

DOE Solar Forecasting Prize Panel – 20 minutes (including Q&A)

Xianglei Huang, Professor, University of Michigan

Geoff Galgon, Nimbus AI

David Larson, Engineer/Scientist III, Grid Ops & Planning, EPRI

DOE Probabilistic Solar Power Forecasting Panel – 40 minutes (including Q&A)

Bri-Mathias Hodge, Associate Professor, University of Colorado Boulder;
Chief Scientist, NREL

Aidan Tuohy, Program Manager, EPRI

Ben Hobbs, Director, JHU Environment, Energy, Sustainability & Health
Institute, Johns Hopkins University

6:30 p.m. – 8:00 p.m.

Networking Reception

Location: Four Square Ballroom (3rd Floor)

Wednesday, June 8, 2022

7:30 a.m. – 8:30 a.m.

Breakfast

Location: Four Square Ballroom (3rd Floor)

8:30 a.m. – 10:30 a.m.

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

Chair: **Nitika Mago**, Manager, Electric Grid Operations, ERCOT

Location: Marco Polo Ballroom (3rd Floor)

Forecaster Experience Working with a TSO on the Current and Planned use of Probabilistic Forecasts in Market Operation

Jeff Lerner, Customer Solutions Manager, ENFOR

Integration of Probabilistic Forecasts into the EMS and MMS – Status and Prospects
Amber Motley, Senior Manager, Short Term Forecasting, CAISO
Sankaran Rajagopal, Director, Energy Market Management Business Solutions, Siemens

Integration of Probabilistic Forecasts into the EMS and MMS – Status and Prospects
Khosrow Moslehi, Director, Product Management, Hitachi Energy
Tolu Dina, Manager - Operations Performance and Analysis, NYISO

10:30 a.m. – 10:45 a.m.

Break

Location: 3rd Floor Foyer

10:45 a.m. – 12:30 p.m.

Session 4: Dynamic Reserve Applications Panel Discussion

Chair: **Debbie Lew**, Associate Director, ESIG

Location: Marco Polo Ballroom (3rd Floor)

Batteries and Ramping Reserves

Arne Olsen, Senior Partner, Energy and Environmental Economics, Inc.

The Case for Dynamic Reserve Allocation in NY State

Rana Mukerji, Senior Vice President–Market Structures, NYISO

Dynamic Reserves – Definition and Allocation

Pedram Mohseni, Director of Quantitative Analytics, Duke Energy (invited)

Survey of Adoption of Dynamic Reserve Practices

Jo Ann Ranola, Grid Ops & Planning, EPRI

12:30 p.m. – 1:30 p.m.

Lunch

Location: Four Square Ballroom (3rd Floor)

1:30 p.m. – 3:00 p.m.

Session 5: Impacts of Climate Change

Chair: **Laurent Dubus**, Senior Scientist on Weather and Climate, RTE (France)

Location: Marco Polo Ballroom (3rd Floor)

Climate Change Impacts on Wind Power Generation

Sara C. Pryor, Professor, Cornell University

Renewable Resource Interannual Variability under Current and Future Climate Scenarios

Sue Ellen Haupt, Deputy Director, Research Applications Laboratory, NCAR

Potential Impacts of Climate Change on BPS Planning and Operation

Bri-Mathias Hodge, Associate Professor, University of Colorado Boulder; Chief Scientist, NREL

3:00 p.m. – 3:15 p.m.

Break

Location: 3rd Floor Foyer

3:15 p.m. – 5:00 p.m.

Session 6: Extreme Weather Conditions

Chair: **Aidan Tuohy**, Program Manager, EPRI

Location: Marco Polo Ballroom (3rd Floor)

The Evolving Role of Extreme Weather Events in the Power System

Josh Novacheck, Electricity System Research Engineer, NREL

Planning Data Sets Accounting for Extreme Weather Events

Justin Sharp, Principal & Owner, Sharply Focused

Planning for Extreme Weather Events Case Study

Richard Tabors, President, Tabors, Caramanis and Rudkevich

Thursday, June 9, 2022

8:00 a.m. – 9:00 a.m.

Breakfast

Location: Four Square Ballroom (3rd Floor)

9:00 a.m. – 10:30 a.m.

Session 7: High VRE Futures – How Are Markets Evolving?

Chair: **Erik Ela**, Principal, EPRI

Location: Marco Polo Ballroom (3rd Floor)

Market Design Evolution for a Decarbonized Energy Future

Karen Palmer, Senior Fellow, Resources for the Future

Intraday Settlements to Mitigate DER Forecast Uncertainty Risk

Pamela MacDougall, Environmental Defense Fund

GFM Penetration and Market Product Requirements

Julian Leslie, Head of Networks and Chief Engineer, National Grid ESO (UK)

Forecasting and Market Evolution in AEMO

Liam McManus, Operational Forecasting Analyst, AEMO (Australia)

10:30 a.m. – 10:45 a.m.

Break

Location: 3rd Floor Foyer

10:45 a.m. – 12:30 p.m.

Session 8: Closing Plenary - Taking Stock: Where are We and What Lies Ahead?

Chair: **Charlie Smith**, Executive Director, ESIG

Location: Marco Polo Ballroom (3rd Floor)

Panel discussion with forecast developers, forecast users, researchers and consultants to talk about issues, gaps, opportunities and needs based on their experience and observations from the workshop.

- Where is there room for improvement?
- What are the remaining barriers?
- Where is the greatest value to be obtained?

Panelists:

Mark Ahlstrom, President, ESIG Board of Directors, & NextEra Energy Resources

Craig Collier, Chief Meteorologist, Head of Operations, Energy Forecasting Solutions, LLC
Tassos Golnas, Technology Manager, Solar Energy Technologies Office, DOE
Nitika Mago, Manager, Electric Grid Operations, ERCOT
Debbie Lew, Associate Director, ESIG
Laurent Dubus, Senior Scientist on Weather and Climate, RTE (France)
Aidan Tuohy, Program Manager, EPRI
Erik Ela, Principal, EPRI
Sue Ellen Haupt, Deputy Director, Research Applications Laboratory, NCAR