



2024 Forecasting & Markets Workshop

# Salt Lake City, UT

June 11 – 13, 2024

## Tuesday, June 11, 2024

7:00 a.m. – 8:00 a.m.

### **Registration & Breakfast**

Location: Salons G-J

8:00 a.m. – 12:00 p.m.

### **Tutorial: Weather Datasets for Power System Planning**

Moderator: **John Zack**, MESO

Location: Salons EF

State of the Art in Datasets (20 min)

**John Zack**, MESO

Problems with Existing Datasets (20 min)

**Justin Sharp**, Principal/Owner, Sharply Focused

Evaluation and Adjustments to the ERA5 (20 min)

**Jim Wilczak**, Research Meteorologist, NOAA

Approaches to Historical Datasets – (1 hr)

CONUS404, A High-resolution Hydro-climate Dataset

**Sue Haupt**, Senior Scientist, NSF National Center for Atmospheric Research

Applying the WIND Toolkit and WTK-LED to Grid Integration

**Luke Lavin**, Researcher III, NREL

Historical and Forward-Looking Datasets

**Cameron Bracken**, Earth Scientist, PNNL

10:00 a.m. – 10:20 am

### **Break**

Location: Foyer

Approaches to Forward Looking Datasets – (1 hr)

Energy Exascale Earth System Model

**Robert Arthur**, Staff Scientist, LLNL

Sup3rCC Dataset

**Grant Buster**, Data Scientist, NREL

WORKSHOP AGENDA SPONSORED BY



**SIEMENS**

Creating Hourly Weather Timeseries for Future Climates  
**David Larson**, Technical Leader, Grid Ops & Planning, EPRI

Using the Data Properly – Example and Facilitated Discussion (40 min)

A Case Study

**Josh Novacheck**, Transmission Planning Engineer, NextEra Energy Resources;  
Chair, ESIG System Planning Working Group

Facilitated Discussion

**John Zack**, MESO

12:00 p.m. – 1:15 p.m.

**Lunch**

Location: Salons G-J

1:15 p.m. – 2:30 p.m.

**Introduction / Opening Remarks**

Location: Salons EF

Opening Remarks

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

Keynote: *Inventing the Future*

**Melanie Frye**, President & CEO, WECC

Industry Overview

**Charlie Smith**, Executive Director, ESIG

2:30 p.m. – 3:00 p.m.

**Break**

Location: Foyer

3:00 p.m. – 5:00 p.m.

**Opening Plenary Session: AI Applications to Forecasting and Markets**

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

Location: Salons EF

AI Applications to Hazardous Weather Forecasting

**Aaron Hill**, Assistant Professor, University of Oklahoma

AI Applications to Long Range Energy Forecasts

**Benjamin Toms**, Founder, Intersphere

Use of AI in Creating Market Offers

**Alan Smith**, Senior Fellow, NextEra Analytics

Cloud Nowcasting Using Deep Neural Nets

**Eric Gritmit**, Technology Manager, Applied Meteorology, Vaisala

Artificial Neural Networks for Improved Forecasting for Distributed PV

**David Larson**, Technical Leader, Grid Ops & Planning, EPRI

6:30 p.m. – 8:00 p.m.

**Networking Reception**

Location: Skylight Ballroom

**Wednesday, June 12, 2024**

7:00 a.m. – 8:00 a.m.

**Breakfast**

Location: Salons G-J

8:00 a.m. – 9:45 a.m.

**Session 2A: Improving DER Participation in Organized Markets**

**Session Chair: Erik Ela**, Technical Executive and Program Manager, EPRI

Location: Salons EF

MMS Development of Aggregated DER Bids and Implementation in CAISO for FERC Order 2222 Compliance

**Ashmin Mansingh**, Global VP of Engineering, Siemens Grid Software

**Jay Jones**, Senior Advisor, Market Technology Support, CAISO

Coordinating Aggregator Participation in Markets with the DSO for FERC Order 2222

**Dylan Cutler**, Head of Product, Camus Energy

Aggregate Distributed Energy Resource (ADER) Pilot Project

**Dave Maggio**, Principal, Market Design & Analytics, ERCOT

Aggregator Point of View

**Geoff Ferrell**, Sr. Vice President, Global C&I and VPP Project Business, sonnen

8:00 a.m. – 9:45 a.m.

**Session 2B: Growth of Large Loads**

**Session Chair: Sophie Meyer**, Director of Power Systems, Grid Strategies

Location: Salon D

Large Load Perspective

**Sophie Meyer**, Director of Power Systems, Grid Strategies

Industrial Thermal Batteries

**Michael Hagerty**, Principal, The Brattle Group

AI and Datacenters

TBD

New Manufacturing Driven Load Growth

**Joseph Church**, Senior Forecast & Load Analyst, Salt River Project

Forecasting Growth of Large Loads

**Victor Ni**, Senior Market Strategy Advisor, MISO

9:45 a.m. – 10:15 a.m.

**Break**

Location: Foyer

10:15 a.m. – 12:00 p.m.

**Session 3A: Considerations for 100% Zero Marginal Cost Markets**

**Session Chair: Robin Hytowitz**, Energy Management Advisor, NextEra Analytics

Location: Salons EF

Market Evolution Towards 100% Clean Electricity

**Chris Geissler**, Director, Economic Analysis, ISO-NE

Scalable Markets for the Energy Transition

**Arne Olson**, Senior Partner, Energy and Environmental Economics, Inc.

Markets for Resource Adequacy and Electricity as a Public Good

**Kelli Joseph**, Senior Fellow, Electricity Market Design & Climate, University of Pennsylvania

A Developer's Vision for Clean Energy Markets

**Jessica Greenberg**, Sr. Manager, Growth Strategy & Power Markets, Enel North America (invited)

10:15 a.m. – 12:00 p.m.

**Session 3B: Advances in Wind and Solar Forecasting**

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

Location: Salon D

Research Activities to Improve NOAA's High Resolution Rapid Refresh Model

**Dave Turner**, Chief Scientist, NOAA Global Systems Laboratory and Manager of NOAA's Atmospheric Science for Renewable Energy Program

Solar Forecast Impact on Hybrid Resource Scheduling

**Chris Bremer**, Sr. Data Scientist, Salt River Project

Spreads and Gradient Spreads: An Alternative to the Standard Probabilistic Forecast

**Armin Kahnert**, Sr. Meteorologist, energy and meteo systems GmbH (Germany)

Use of Cloud Nowcasting for Short-term Solar Energy Predictions

**Pascal Storck**, Head of Technology, Vaisala

12:00 p.m. – 1:15 p.m.

**Lunch**

Location: Salons G-J

1:15 p.m. – 3:00 p.m.

**Session 4A: Retail Pricing**

**Session Chair: Paul Sotkiewicz**, President, E-Cubed Policy Associates

Location: Salons EF

How Well Do Customers Respond to Time Varying Retail Rates?

**Sanem Sergici**, Principal, The Brattle Group

New Directions in Real Time Pricing

TBD

C&I Customers Access to Wholesale Prices in RTOs

**Devin Hartman**, Director, Energy and Environmental Policy, R Street

A Data Center Perspective  
TBD

1:15 p.m. – 3:00 p.m.

**Session 4B: Power System Impacts of Rapid Electrification**

**Session Chair: Matt Schuerger**, Senior Fellow, ESIG

Location: Salon D

Infrastructure Impacts of Electrification

**Jun Wen**, Principal Advisor – DSO Strategy & Implementation, Southern California Edison

Unintended Consequences of Building Conversions to Heat Pumps

**Nick Miller**, Principal, HickoryLedge LLC

Navigating the Challenges of Rapid High-density Load Additions

TBD, Xcel Energy

Geospatial Forecasting of Electrification Load and Effects on the T&D System

**Arne Olson**, Senior Partner, Energy and Environmental Economics, Inc.

3:00 p.m. – 3:30 p.m.

**Break**

Location: Foyer

3:30 p.m. – 5:15 p.m.

**Session 5A: Forecasting & Markets**

**Session Chair: Jonathan Black**, Manager, Load Forecasting, ISO-New England

Location: Salons EF

ARPA-E PERFORM Project Results on Flexibility Options and Reserves for DA Markets

**Elina Spyrou**, Leverhulme Lecturer, Imperial College London (UK)

Wholesale Electricity Markets and Resource Adequacy with High Clean Energy Generation Targets

**Bethany Frew**, Group Manager, Capacity Expansion & Electricity Markets Group, NREL

**Nongchao Guo**, Energy Economist & Modeler, NREL

Solar Eclipse: Forecasting, NWP Models and Future Needs

**Adam Simkowski**, Principal Meteorological Risk Analyst, MISO

**Lars Rohwer**, energy and meteo systems GmbH (Germany)

Market Challenges with High Solar Generation

**Donny Holaschutz**, Energy & Sustainability Consultant – Managing Partner, Inodu

3:30 p.m. – 5:00 p.m.

**Session 5B: Utility and ISO Probabilistic Forecasting Developments**

**Session Chair: Timothy Duffy**, Manager, Demand Forecasting & Analysis, NYISO

Location: Salon D

Recent Developments in Probabilistic Forecasting in AEMO

**Andrew Akman**, Principal Data Scientist, AEMO (Australia)

Using Probabilistic Forecasting at SPP

**Jeff Baskin**, Meteorologist / Technical Analyst, SPP

Probabilistic Forecasting Developments in CAISO  
**Amber Motley**, Director, Short Term Forecasting, CAISO

MISO Uncertainty Platform  
**Congcong Wang**, Manager Operations Risk Assessment, MISO

Use of Probabilistic Forecasts in Operational Risk Assessment  
**Riaz Khan**, Sr. Operations Engineer, ERCOT

## **Thursday, June 13, 2024**

7:00 a.m. – 8:00 a.m.

### **Breakfast**

Location: Salons G-J

8:00 a.m. – 9:45 a.m.

### **Session 10: Bridging the Gap between Atmospheric Science and Grid Modeling**

**Session Chair: Cathy Finley**, Associate Professor, University of North Dakota

Location: Salons EF

Connecting the Dots: Status and Prospects  
**Justin Sharp**, Principal/Owner, Sharply Focused

Modeling Extreme Events in the Western Interconnection  
**Jon Jensen**, Engineer, Reliability Modeling, WECC

Status of Climate Change Projections on Wind & Solar Resources  
**Jared Lee**, Project Scientist II, NSF National Center for Atmospheric Research

Forecasting Tail Events and Impact on Energy Price  
**Jennifer Newman**, Vice President of Atmospheric Science Research, REsurety

9:45 a.m. – 10:15 a.m.

### **Break**

Location: Foyer

10:15 a.m. – 12:00 p.m.

### **Session 11: Closing Plenary Session - Panel Discussion of the Issues and Challenges in the Energy Transition**

**Session Chair: Sue Haupt**, Senior Scientist, NSF National Center for Atmospheric Research

Location: Salons EF

There are many barriers that have limited the pace of adoption of carbon-free energy generation well below the baseline trend necessary to meet aggressive decarbonization goals set by governments around the world. Some of these barriers include inadequate replacement or retiring generation with clean resources; unprecedented electrification and resulting load growth; inadequacies in weather and climate models, data and forecasts.

We plan to summarize the current situation and have an interactive discussion with panelists and the audience about what steps can be taken to overcome these barriers. Insights and feedback for ISOs, utilities, government labs, forecasters and researchers will be sought.

Ensuring that the energy system planners and operators and atmospheric science communities have a mutual understanding of each other's needs is key to meeting society's decarbonization goals.

Summary Comments from the Power System Perspective (10 min)

**Paul Sotkiewicz**, President, E-Cubed Policy Associates

Summary Comments from the Meteorology Perspective (10 min)

**John Zack**, MESO

### **Panelists for the Discussion on Overcoming the Barriers**

Facilitated by **Sue Haupt**, NSF National Center for Atmospheric Research

**Matt Schuerger**, Senior Fellow, ESIG

- **Paul Sotkiewicz**, President, E-Cubed Policy Associates
- **John Zack**, MESO
- **Pascal Storck**, Head of Technology, Vaisala
- **Erik Ela**, Technical Executive and Program Manager, EPRI
- **Jim Wilczak**, Research Meteorologist, NOAA
- **Andrew Akman**, Principal Data Scientist, AEMO (Australia)
- **Justin Sharp**, Principal/Owner, Sharply Focused
- **Jennifer Newman**, Vice President of Atmospheric Science Research, REsurety