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AWS Truepower and Lawrence Livermore National Laboratory Collaborate on Department of Energy Project

Improved wind power generation forecasts alert wind control room operators in extreme conditions

Albany, NY—December 14, 2011—[AWS Truepower, LLC](#), an international leader in renewable energy consulting and information services, in collaboration with Lawrence Livermore National Laboratory (LLNL), today released important findings from a multi-phase wind forecasting research project known as WindSENSE. The project, funded by the United States Department of Energy’s Energy Efficiency and Renewable Energy program, was designed to develop an observation deployment system and improve wind power generation forecasts.

AWS Truepower’s primary role in the WindSENSE forecasting project was to identify the locations and sensor types required to improve short-term and extreme-event forecasts. The team used an Ensemble Sensitivity Analysis (ESA) approach to identify specific locations and variables. The study resulted in important forecasting tools which alert control room operators of wind conditions and energy forecasts during extreme conditions called ramp events.

Ramp events occur when sharp increases or decreases in wind speed occur over a short period of time, leading to a large rise or fall in the amount of power generated. During certain weather regimes, currently unexpected ramp events, whose precursors are often not adequately sensed by existing observing systems, can frequently be anticipated an hour or more in advance with a few specific weather variable measurements from key locations. The use of ESA, along with an analysis of a sample of ramp cases, can provide guidance on where and what to measure to improve the prediction of these events.

“We’re trying to forecast wind energy at any given time,” said Chandrika Kamath, the LLNL lead on the project. “One of our goals is to help the people in the control room at the utilities determine when ramp events may occur and how that will affect the power generation from a particular wind farm.”

It is critical that wind forecasts be accurate, especially during ramp events, when the energy can change by more than 1000 MW within an hour. Accurate alerting systems are in high demand as the percentage of wind energy contributing to the power grid continues to increase and the variable nature of wind challenges grid managers and utilities to maintain generation and load balance.

"The observation targeting research conducted as part of the WindSENSE project resulted in the development and testing of algorithms that provide guidance on what weather variables to measure and where to measure them in order to improve wind forecast performance," stated John Zack, Director of Forecasting of AWS Truepower. "These new software tools have the potential to help forecast providers and users make informed decisions and maximize their weather sensor deployment investment."

WindSENSE research suggests that assimilation of an observation at the target location would improve the initial value of 80-m wind speed, but the forecast was only improved for one hour. The combination of observations at more than one location suggested an improvement in the forecast for a few hours. There also were seasonal differences and improved forecasts with the introduction of one or more sodar units.

The full report is available for download on AWS Truepower's website:

<http://www.awstruepower.com/2011/12/study-observation-deployment-system-to-improve-wind-power-generation-forecasts/>

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About AWS Truepower, LLC:

AWS Truepower provides the most accurate, reliable, and innovative renewable energy project development and operations solutions available today. Energy developers, investors, utilities, system operators, and governments rely on the company's 30 years of experience, proven science, and technology to reduce uncertainty, mitigate risk, and maximize return on their investments. Headquartered in New York, AWS Truepower has offices in North America, Europe and Asia. Learn more about the company online at awstruepower.com.

About Lawrence Livermore National Laboratory:

Founded in 1952, Lawrence Livermore National Laboratory (www.llnl.gov) provides solutions to our nation's most important national security challenges through innovative science, engineering and technology. Lawrence Livermore National Laboratory is managed by Lawrence Livermore National Security, LLC for the U.S. Department of Energy's National Nuclear Security Administration.