

**Press Release
For Immediate Release**



Contact: Loyd G. Drain
Email: loyd.drain@wyo.gov
Phone: 307.635.3573

**University of Wyoming wind power study demonstrates benefits
of pairing Wyoming and California winds**

Leveraging geographic diversity leads to strong, steady renewable electricity supply for California

CHEYENNE, Wyo., July 27, 2015 – A new University of Wyoming (UW) Phase II Study further demonstrates that combining the strengths of Wyoming wind with California wind and solar will reduce the intermittency of renewable energy and smooth the power supply—leading to benefits for utilities and energy consumers alike.

Conducted by UW’s [Wind Energy Research Center](#), the Study digs into the details of geographic diversity relative to renewable energy and is based on one year of actual 1-minute average wind and solar electrical production data from California and data from four operating meteorological towers in Wyoming. This analysis builds on previous Phase I research based on general atmospheric and modeled data. The new Phase II study results were [previewed](#) on June 11, 2015, at the Wyoming Infrastructure Authority’s Spring Energy Conference.

Analyzing this precise wind data over the course of days and over the course of a year, the UW researchers confirmed that Wyoming and California wind patterns are not only very different but also very complementary. Based on a yearly average, California wind is strongest at night, while Wyoming wind is strongest during the day and peaks in the afternoon coincident with the time when the sun is beginning to set while the electric load is still increasing into the evening hours.

Renewable energy power plants may be considered intermittent because their output depends on varying weather, wind and sun patterns. However, by combining different and complementary renewable resources – also called diverse resources – utilities can effectively smooth-out the peaks and valleys of renewable energy production to ensure smoother, less variable and more predictable renewable energy supplies. This makes the energy grid easier to balance, minimizes ramping events, and lowers operating costs.

Danny Curtin, Director, California Conference of Carpenters said: *“this Phase II Study is yet another study that quantifies the benefits California ratepayers can achieve by integrating Wyoming’s world-class wind energy into the California Independent System Operator System (CAISO). California’s E3 organization has also recently published a report on the benefits of geographic diversity. RTO’s across the U.S. such as MISO, SPP and PJM have reaped the benefits of diverse power resources, and California has the opportunity to do the same with renewable energy. The [Jim Detmers’ Report](#) being released concurrent with this Study is excellent work as well and recommended reading.*

When an official of the Midwest Independent System Operator (MISO) reviewed the Study, he said: *“Thanks to MISO’s work with stakeholders, we have been able to integrate significant wind generation in a reliable way. Our efforts to plan for new wind generation, resulting from public policy mandates, and integrate it into the MISO markets have provided hundreds of millions of dollars in economic benefits to our members,”* said **John Lawhorn, Senior Director of Policy and Economic Studies**. *“Additionally, MISO has found reliability benefits from diversity of wind locations. We were happy to share this experience with our industry partners as they work to integrate wind and solar resources.”*

The Study reflects that a less variable, more predictable grid will provide other benefits for California including *a decrease in water use; a decrease in greenhouse gas emissions; a decreased requirement for more costly energy storage*; and reflects significant value of utilizing Wyoming wind vs. the addition of even more solar resources to the CAISO System. *For example, the study looks at a scenario for adding incremental renewables to an existing portfolio and when comparing Wyoming wind vs more same-profile California solar, Wyoming wind would yield a 50% higher capacity factor; a 41% lower relative variability; and increase the amount of time in which power is producing at 25% or greater by 86% (see Table 6 on page 18).*

The Study also proposes new ways to measure the performance of renewable energy plants, collectively called Renewable Energy Quality Metrics (REQM). Just like stock market investors have metrics and information to help guide their investment decisions, the Study's author suggests that utilities need a more robust set of metrics to guide their renewable project investment decisions – and to choose resources that not only work well and are cost-effective on their own but also, and more important, that work well and are cost-effective when combined together on the grid. “Capacity factor alone does not fully describe a renewable resource or... the combination of renewable resources,” the report notes. How these Quality Metrics would benefit California's electrical grid are outlined in a separate companion [Report by Jim Detmers](#), former COO of the California Independent System Operator Corporation (California ISO).

The new UW Study and the Detmers Report are the latest in a string of reports that demonstrate the economic advantages of Wyoming wind for California, including the [WECC 2011 analysis](#) that showed California consumers could save \$600 million annually; the [UW's Phase I Geographic Diversity Study](#) in 2013 that showed cost-savings by boosting resource diversity; and the [NREL 2014 analysis](#) that showed up to \$1 billion in annual savings to California by tapping Wyoming wind resources.

Lloyd Drain, Executive Director of the Wyoming Infrastructure Authority, said: *“As California moves toward mandating the use of more renewable energy, the families and individuals paying those monthly electricity bills would agree that the best and most beneficial types of renewable energy sources are the ones that should be used. Collectively, the findings within these studies are consistent and clear. Incorporating diverse, cost-effective Wyoming wind into California's power grid will help California best protect their consumers and enhance their economy. Wyoming energy can help California citizens save literally billions of dollars over time on their electric bills, freeing up such money that can be spent on other goods and services to further benefit California's economy.”*

The Phase II Study, posted on the [WIA website](#), will be presented at a WIA meeting in Berkeley, CA on July 28, 2015. The public is invited and there is no charge to attend—the agenda is available [here](#).

In the event inquiries are made after July 31, 2015, such should be directed to Jason Begger at Jason.Begger@wyo.gov.

###

About the Wyoming Infrastructure Authority

The WIA, an instrumentality of the State, was created by the State Legislature in 2004. The authority is governed by a five-member Board of Directors appointed by the Governor, with the advice and consent of the Senate.

The WIA advances Wyoming's Energy Strategy by promoting the value of Wyoming's energy resources, supporting expanded infrastructure, enhancing resource development and operation, and ensuring a credible and objective voice for Wyoming.

In addition, the WIA has \$1 billion in bonding authority for financing of infrastructure relative to facilities within its legislative purview.

WIA Board Members include:

- Mike Easley (Chairman): CEO of Powder River Energy Corporation in Sundance, WY
- David Sparks (Member): Senior Research Scientist, TTI, and Transportation Executive in Jackson, WY
- Don Collins (Treasurer): CEO, Western Research Institute in Laramie, WY
- Mark Stege (Member): Vice President of Operations, Cheyenne Light, Fuel & Power in Cheyenne, WY
- Ken Miller (Member): President & CEO (Retired), Millennium Bulk Terminals Longview, LLC in Longview, WA