

PNW-SGDP Newsletter



December 2014

Entering the PNW-SGDP's final stretch



We're now just months from wrapping up a five-year effort that I strongly believe will deliver lasting, valuable impact to the region, the nation and efforts to create a more efficient and reliable power grid.

The Pacific Northwest Smart Grid Demonstration Project

(PNW-SGDP) concluded its third phase—data collection—on August 31. Since then, work has focused on tying up a few loose ends, ensuring quality data and, most importantly, analyzing the data, which will help us draw conclusions about the project and the effectiveness of smart grid technology, its costs and benefits. We'll be particularly interested in the performance of transactive control and its potential for broad application.

As I look back over the past five years, it has been a very exciting time for me and the entire PNW-SGDP team. The innovation and hard work of our technology partners has enabled the deployment and evaluation of transactive control and other operational aspects of the project. The utilities courageously undertook the application of new technology, addressing numerous challenges and applying ingenuity to achieve some really exciting successes, while also learning lessons that will carry value far into the future. And of course, electric customers across the five-state region played a vital role in this effort. Many of them have helped test the technologies and provided important feedback and suggestions—and along the way they were exceedingly patient with us.

This project has extended our region's electrical infrastructure, tested a wide range of smart grid

technologies, involved electric customers, and saved energy. A lot has been accomplished, and in the months ahead, we'll be learning more from our data analysis efforts and sharing the results with you. We will soon have a better understanding of the potential contributions of our work to grid modernization efforts.

Ronald B. Melton, Ph.D.
Project Director

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Project Objectives and Attributes

Primary Objectives:

- ✦ Develop and validate an interoperable distributed communication and control infrastructure using transactive control signals;
- ✦ Measure and validate smart grid costs and benefits;
- ✦ Contribute to the development of standards and transactive control; and
- ✦ Apply smart grid capabilities to support the integration of renewable resources.

Operational Objectives:

- ✦ Manage peak demand;
- ✦ Facilitate wind integration;
- ✦ Address constrained resources;
- ✦ Improve system reliability;
- ✦ Improve system efficiency; and
- ✦ Select economical resources.

Key Attributes:

- ✦ Leave an installed operational base of smart grid assets and successful operational strategies for the region.
- ✦ Stimulate the regional and national economy by creating jobs and a vibrant smart grid industry.

PNW-SGDP data collection concludes; analysis begins

Final project reports expected in early 2015

The Pacific Northwest Smart Grid Demonstration Project's data collection phase came to an orderly close on August 31, achieving a key milestone while also signaling the beginning of data analysis, which will inform the final project reports. It's anticipated that outcomes from the five-year PNW-SGDP will play an important role in shaping regional and national policy and approaches for advancing grid modernization.

With most of the data collected and accounted for, teams at Battelle have continued to work with the project partners to reconcile any remaining data gaps and help ensure the quality of the overall analysis process. The goal is to finish analysis by early January, after which final project reports will be completed and communicated to the U.S. Department of Energy, stakeholders and the public.



Analysis of data gathered by the project will provide insights into smart grid costs and benefits.

The data collection period began in fall 2012 and was celebrated that year with an October 24 “Go Live” event at the University of Washington. Since then, millions of records have been generated. The collection of data and subsequent analysis will provide an unprecedented view into how smart grid concepts can provide regional benefits while improving consumer choice and reliability locally. The information will allow evaluation of smart grid costs and benefits to consumers in the Northwest and provide insights into how the power system can be optimized while adding more renewable energy resources such as wind and solar.

During the final months of the PNW-SGDP, a number of other activities are wrapping up. For instance, the project is assembling “lessons learned”—or examples of aspects of the project that perhaps didn’t go as planned, but offer learning tools for future smart grid efforts. Lessons learned were identified in areas ranging from public communications strategies and the maturity levels of vendor-supplied technologies, to interoperability standards and the challenges utilities face in managing the quantity and quality of data flow.

Flathead survey finds support for smart grid approaches

Utility gains customer feedback on grid demonstration experiences

Most customers who participated in Flathead Electric Cooperative’s Peak Time program say they’d do it again—and recommend it to their neighbors. The Co-op conducted a survey by mail in August, pulsing participants on their Peak Time experiences and seeking feedback to help guide Flathead’s future smart grid efforts.

Peak Time was the Co-op’s customer-facing name for programs implemented as part of the Pacific Northwest Smart Grid Demonstration Project. More than 300 customer volunteers signed up to participate in one of three Peak Time options:

- **In-home display:** Display units alert households to peak electricity demand on the power system and signal the need to temporarily reduce consumption
- **Water heater demand response units:** Devices cycle off home water heaters during peak demand
- **Home Energy Network:** Appliances—a dishwasher, washer/dryer set and water heater demand response unit, all paid for by the participating customers—were enabled to communicate with the utility and cycle on and off, to help reduce demand.

More than 60 percent of Peak Time participants responded to the Co-op's survey. Of those, approximately 90 percent were pleased overall with their experience, indicating they would be willing to take part again and recommend the program to their friends and neighbors.

“Surveys are not everybody's favorite thing to do, so we were very pleased with the response rate. In addition to answering questions, participants also provided comments, most of which were positive,” says Teri Rayome-Kelly, the utility's demand response coordinator.



Teri Rayome-Kelly

The few less-than-positive comments generally came from participants of the in-home display option. “There were customers who didn't experience what they had hoped to, primarily because the display units were limited in their functionality,” Rayome-Kelly explains. The units would provide alerts when power use was peaking on Flathead's electric system, but were never able, as originally intended, to display customer electricity use in real time.

Flathead's survey included approximately 20 questions. Several questions established baseline information, such as home square footage, heat and air conditioning sources and structural or energy upgrades to homes that might influence heating and cooling, as well as smart device operation. Other questions probed the participants' practices in managing their electricity use, and their overall Peak Time experience.

The technologies used in Flathead's grid demonstration activities were part of more than \$80 million in smart grid equipment and systems—and approximately 90 technology experiments—deployed across the PNW-SGDP's five-state region. In addition to advancing the Northwest's electrical infrastructure, the grid demonstration project is helping inform the nation's future smart grid efforts.

Stories share PNW-SGDP successes

The progress of the Pacific Northwest Smart Grid Demonstration Project has been captured in “Success Stories” articles that showcase the accomplishments of the project's ten participating utilities and the University of Washington.

Teresa Waugh of the Bonneville Power Administration researched and penned the articles during the past six months, effectively painting a picture of the triumphs and travails the 11 partners experienced as part of their participation in the unique demonstration project. From rural Oregon's Milton-Freewater City Light and Power, to large regional entities like Avista, the articles capture the partners' efforts and celebrate the unique flavors of a trailblazing, five-state project.

The Success Stories are available on the [PNW-SGDP website](#) and the [BPA website](#). The articles, along with some additional related content, will be compiled into a booklet, expected to be available in early December.

Grid demo represented at inaugural Idaho energy conference

The Pacific Northwest Smart Grid Demonstration Project shared its story with energy experts and leaders who gathered for the first Intermountain Energy Summit in Idaho Falls, Idaho, in late August. The Bonneville Power Administration sponsored the PNW-SGDP booth in the event's exhibit hall.

The summit's mission is to support a coherent, coordinated, sustained and balanced approach to energy in the Intermountain Region, defined as stretching from Alberta and Saskatchewan in Canada to Utah and Colorado. U.S. Department of Energy Secretary Ernest Moniz delivered the summit's keynote address. Other speakers included journalist and author Robert Bryce and the Nuclear Regulatory Commission's Kristine Svinicki. The event attracted several hundred participants.

The PNW-SGDP booth included videos and informational materials. In addition, outside the conference hall, Idaho Falls



The PNW-SGDP booth, with, from left, Richard Stroh (BPA), Teresa Waugh (BPA) and Vincent Genetti (Battelle).

Power displayed electric vehicles, which were part of the utility's PNW-SGDP project that explored integration of electric vehicles, energy storage and solar panels.

Transactive energy conference set for December 10-11

The GridWise® Architecture Council and Smart Grid Northwest are hosting the Second International Conference and Workshop on Transactive Energy, December 10-11, 2014, at the World Trade Center in Portland, Ore.

The meeting brings together representatives of government, industry, utilities, vendor organizations and academia who have an interest in advancing transactive energy—an approach that combines economic and control techniques to improve power grid reliability and efficiency.

Capacity is limited and regular ticket prices end on December 7, at which point late registration prices go into effect. [More information.](#)

PNW-SGDP description

The Pacific Northwest Smart Grid Demonstration project is a regional endeavor funded by the Department of Energy under the American Recovery and Reinvestment Act of 2009. The goal is to verify the viability of smart grid technology and quantify smart grid costs and benefits. This information will help validate new smart grid business models at a scale that can be adapted and replicated nationally.

With the 50 percent DOE matching funds, this project has operated on a \$178 million budget.

The smart grid can help meet increasing power demands, reduce greenhouse gas emissions, promote energy independence, enhance reliability and help improve national security. It is a system that uses technology to enhance power delivery and use through intelligent two-way communication. Power generators, suppliers and users are all part of the equation.

With increased communication and information, the smart grid can monitor activities in real time, exchange data about supply and demand and adjust power use to changing load requirements. Smart grid technology includes everything from interactive appliances in homes to substation automation and sensors on transmission lines.

The regional project, the largest smart grid demonstration project in the nation, is led by Battelle Memorial Institute, Pacific Northwest Division. Participants include the Bonneville Power Administration, utilities, universities and infrastructure partners.

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