



Pacific Northwest Smart Grid Demonstration Project SUCCESS STORIES

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BENTON PUD

Stepping into smart grid

Flanking the Columbia River in Washington are three sunny cities — Richland, Pasco and Kennewick — with roots in many things from vineyards to energy. Challenged by being one of the fastest growing areas in the state, utility providers here work together to make sure the lights stay on. They also team up to find new, innovative energy solutions to meet the area’s growing energy needs. That’s why Benton PUD opted to take part in the Pacific Northwest Smart Grid Demonstration Project. The goal: investigate new technologies and prepare for a more efficient future.

The project — in its fifth and final year — is led by Battelle Northwest, about 15 miles upriver from Benton PUD’s headquarters at the Pacific Northwest National Laboratory. Other partners include 10 utilities, both public and private, five infrastructure projects and two universities. Each participant’s investment, including the Bonneville Power Administration’s \$10 million contribution, was matched by the Department of Energy using 2009 Recovery Act stimulus funds. Benton PUD invested \$512,500.

The public-power utility district focused

on two test cases: energy storage and a Web platform to work with smart meter data. A smart meter uses two-way communications between a customer and the utility to improve services. This framework is called an advanced metering infrastructure, or AMI.

An AMI opens up a world of useful data to make the operation of the grid more efficient.

For Benton PUD, knowing how to apply the data was the first step.



BENTON PUD Kennewick, Washington

- Founded in 1934
- 939 square miles
- 1,626 circuit-miles of line
- 49,816 metered customers

INVESTMENT IN PNWSGDP:

- \$512,500

HIGHLIGHTS:

- AMI event data
- Energy storage

FOR MORE INFORMATION:

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A data training tool

A Web platform called DataCatcher™ used real-time communication to acquire alarm data from the wireless AMI system. These alarms notified the utility of potential problems on the system, such as high voltages, low voltages, hot sockets and outages. This off-the-shelf but customizable software enabled operations groups to know what's going on with the system. Any potential problem could then be actively addressed.

Learning the dos and don'ts of handling the alarm data demonstrated how to best maximize the AMI meters in two ways. First, identify which department would best benefit from that information. Second, learn how to most effectively implement the information into a future data management system that will eventually replace the DataCatcher™ demonstration.

"We now know the basics about collecting the AMI meter alarm data and how to present it. That will help us define our requirements for future integration with our other systems," said Blake Scherer, project manager with Benton PUD.

Ultimately, learning about those future requirements was the biggest benefit for Benton PUD from the demonstration.

Energy storage partners

Forging an energy storage partnership with Franklin PUD and the City of

“The project helped to raise awareness of things like cyber security and interoperability. It also raised awareness on those kinds of topics between Information Technology and Engineering – about working together to make the project happen.”

– BLAKE SCHERER,
PROJECT MANAGER WITH BENTON PUD

Richland was conceptually unique. Each utility installed an energy storage device that would be controlled by Benton PUD. The battery-based 10-kilowatt system would store electricity during off-peak periods when the price is cheap, and then distribute the energy later when the demand is high.

"One goal was to test software that uses a transactive incentive signal provided by Battelle," said Scherer. "Then, wirelessly direct operations of storage devices from neighboring utilities and dispatch them as load or generation, as circumstances dictated."

Transactive control uses an interactive, market-based signal to increase or decrease the energy consumption of households and industries to achieve

greater efficiency in grid operations. In the Pacific Northwest, the signal is sent over a multiple utility footprint. Participants in the project test the feasibility of increasing energy use when wind energy is abundant, typically at night, and reducing use during peak hours when energy is most expensive. The integration of the technologies was a challenge for some participants in the project because of the complexity of the project and the cost.

Unfortunately for Benton PUD, the energy storage vendor went out of business while a contractor was trying to implement the transactive control software.

"We were unable to have it working before the vendor went out of business," said Scherer.



Lessons learned

The biggest lesson learned: structure vendor contracts using milestones for certain accomplishments.

“We initially needed flexibility in the scope of work,” said Scherer. “But as the project became clearer, we should have established new payment milestones for our vendor. As it was, our contractor struggled with the complexity of the project, which used up our project budget and resulted in several deliverables not being completed by the contractor.”

Other lessons included properly understanding the level of effort required for a federal demonstration for the level of effort required for a federal demonstration. The project reporting and project management requirements were more than expected.

On the plus side, the project improved awareness of cyber security best practices.

WHAT'S NEXT for Benton PUD?

With an AMI foundation in place, Benton PUD wants to maximize the value of this investment by applying its lessons learned from the demonstration and continuing to organize and present AMI meter event data to utility personnel to improve system operations, reliability and power quality. With regards to energy storage, Benton PUD will continue to monitor developments in the industry, looking for the technology to mature and the costs to decrease.

