

Wednesday November 25 2009

DOE releases list of demo grantees as we gather details, insights

DOE awarded \$620 million to [32 smart grid regional demonstration projects](#) yesterday, “to demonstrate advanced smart grid technologies and integrated systems that will help build a smarter, more efficient, more resilient electrical grid,” the agency told the press. The projects “will further our knowledge and understanding of what works best and delivers the best results for the smart grid, setting the course for a modern grid that is critical to achieving our energy goals,” Energy Secretary Steven Chu said in a prepared statement.

Sixteen awards totaling \$435 million will support fully integrated, regional smart grid demonstrations in 21 states, representing over 50 utilities and electricity organizations with a combined customer base of almost 100 million, DOE said.

Streamlined communication technologies, sensing and control devices, in-home systems that empower consumers to cut energy use plus renewable energy sources are all planned.

Sixteen awards totaling \$185 million will help fund utility-scale energy storage

projects, DOE said, noting that it wants to at once “enhance the reliability and efficiency of the grid” and cut “the need for new electricity plants.” Advanced battery systems such as flow batteries, flywheels and compressed air energy systems will be tested in the approved projects.

Counting the matching funds, DOE said the demonstration projects represent an investment of over \$1.6 billion in national smart grid demo projects.

Austin tests the big picture

The Pecan Street Project in Austin, Texas, won a \$10.4 million demo grant.

“We’re going to take the market aggressively,” Austin Energy CIO Andres Carvallo told us yesterday. “Part of downtown is called the 700-acre Mueller development, where about 1,000 homes and some 75 commercial businesses are scheduled to be built. We’ll use the money to accelerate our ability to measure, control and manage DG, primarily solar rooftops, energy storage in the premise, electric vehicle and smart appliances, coupled with all of the investments we’ve

made on smart grid 1.0 around leveraging the smart meter and all the back office software” at Austin Energy.

“Smart grid 1.0,” as he referred to Austin’s existing smart grid deployment, took the utility five years to deploy and cost about \$150 million, he told us in August (SGT, [Aug-06](#)). About \$10 million of that came from DOE to improve energy efficiency. The municipal utility deployed its first 125,000 smart meters in 2003.

“It was all about the seamless integration of the electric grid itself plus all the electric assets we own including power plants -- with a communication

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PUBLISHING NOTE: We will observe the US Thanksgiving Day holiday tomorrow and its usual extension Friday, thus our next issue will be published Monday, Nov 30. All of us in the *Smart Grid Today* family at MMI wish you and your loved ones a wonderful holiday.

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Green Grid Initiative OK'd to take Google, Whirlpool to Copenhagen

When smart grid advocates travel to Copenhagen next month for COP15, the United Nations Climate Change Conference, they will have a clear objective: connect the dots. The smart grid can cut emissions by 60 to 211 million metric tons of CO2/year by 2030, EPRI said in June 2008 but many still do not see a connection between efforts to modernize the electrical system and attempts to reduce global warming, Dan Delurey told us yesterday. He heads the recently-formed Smart Green Grid Initiative SGGI (SGT, [Oct-20](#)).

“On one hand, it’s obvious there is a connection between climate change and DR and the smart grid,” said Delurey, who is also executive director of both the Demand Response Coordinating Committee and the smart grid trade group the Demand Response & Smart Grid Coalition.

“But on the other [hand], there is so much happening at one time and people are so focused that helping them connect the dots is a good and sometimes necessary thing. Sometimes even the obvious needs to be stated explicitly.” Delurey’s new ad hoc group was approved as a nongovernmental organization and as such, he and 12-15 others from firms including Whirlpool, Honeywell and Google, will be flying to Copenhagen. The group’s main message: “the smart grid is something that makes reaching targets for reducing emissions easier,” Delurey said. “Smart grid is at the center of a Venn diagram, surrounded by renewables, electric vehicles, climate change and energy efficiency.”

SGGI members in Denmark “will be operating as a group, but loosely,” he said. “We’ll hold a briefing, we’ll

be sponsoring some activities at the US pavilion where the official meetings take place, we’ll put on a small seminar open to delegates and we’ll have some other activities, joining with other groups.”

The group is partnering with three organizations: The Pew Center on Global Climate Change, the Business Council on Sustainable Energy and the International Emissions Trading Assn. With them “we’ll be holding some briefings talking about why the intersection of smart grid and climate change exists and why smart grid is needed to reach climate goals,” Delurey said.

The group will not be taking part in any treaty negotiations but will measure its impact “over the longer term. I think you’ll see this holistic approach start to gather steam.”

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network” that includes fiber optic throughout the infrastructure and out to the substation and wireless AMI technology from Landis & Gyr for the last mile, Carvallo reported then.

The demonstration grant money will help the Pecan Street Project build a microgrid, DOE reported in a press release yesterday. The city plans to build a “utility of the future community” to see “how the central grid interacts with all of the [new] capabilities on the edge -- and ‘how do you orchestrate central load versus load on the edge?’” said Carvallo.

With the microgrid, “we will be able to see consumer behavior, TOU pricing, real-time pricing, load-management programs -- and see really what happens,” he added. “A lot of people have been talking about what it could be, how would it be and now we’re going to do it.”

If all goes as planned in contract negotiations with DOE, Carvallo suspects Pecan Street’s work will begin to

accelerate in January. The project hasn’t yet chosen tech partners and it hasn’t yet decided who will verify results.

The match to DOE’s grant is already set aside in the nonprofit project’s capital plan, said Carvallo.

Pieces of the technology the Pecan Street Project plans to showcase have been developed elsewhere, he added. “We have a pretty close network of relationships with utilities across the world working on the smart grid. Once we know exactly what we’re going to do here, we’ll leverage all of those lessons learned in partnerships we have at the industry level.”

The DOE grant “recognizes that the Pecan Street Project is a great initiative and consortium of partnerships,” Carvallo said. “We’re looking forward to helping the United States figure out how the ‘utility of the future’ should function.”

DOE plans to give the Center for the Commercialization of Electric Technologies (CCET) in Texas a \$13.5 million demo project grant. It has a statewide purview, and all of the utilities

in Texas are members, said Carvallo, who sits on the center’s board of directors.

CCET is set to “manage the fluctuations in wind power in the large ERCOT transmission grid through better system monitoring capabilities, enhanced operator visualization and improved load management,” DOE said in a document it released yesterday. CCET will install synchrophasors and use integrated smart grid technologies such as home and community battery storage, PHEVs and homes equipped with 1-3 kw solar photovoltaics.

“We will be collaborating with the CCET,” he added. “Just like we need to prove all of this technology can be scaled and managed on a million-consumer footprint, they also need to be scaled and managed at a 50 million, statewide size. That’s what CCET is worried about.”

Battelle covers 5 NW states

The Pacific Northwest Smart Grid Demonstration Project scored \$88.8 million -- the biggest of the 32 issued yesterday -- despite the federal government in June forcing the Portland-based Bonneville Power Administration (BPA) to step aside as the project’s leader due to its status as a national energy marketing agency (SGT, [Aug-28](#)).

The funds will help the project test new combinations of devices, software and analytical tools to boost the grid’s reliability and performance, Battelle Memorial Institute, the project’s new leader, told the press yesterday.

The project will involve over 60,000 metered customers in Idaho, Montana,

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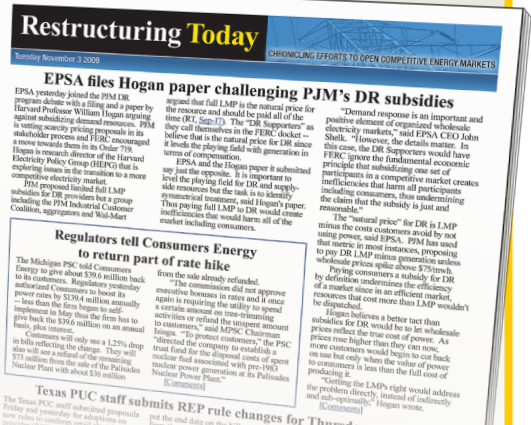
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Oregon, Washington and Wyoming. Battelle's Ron Melton will direct the project that includes a dozen utilities and BPA.

The project team plans to install equipment and technology in 2010 and 2011. Through 2013 or 2014, it will gather data on performance from 15 test sites representing the region's diverse terrain, weather and demographics. Test sites include Fox Island in Washington State's Puget Sound, the Teton Mountains in western Wyoming and the campuses at the University of Washington and Washington State University.

The project will involve over 110 mw, enough to serve 86,000 homes.

IOUs, municipals, co-ops and public utility districts are set to take part, said Battelle. Each project team member will conduct projects tailored to its customers so that the overall demonstration can meet a variety of needs in the five-state region. Battelle will use the Electricity Infrastructure Operations Center at the Pacific Northwest National Laboratory to analyze data collected during the project.

In all, the project will have a budget of \$178 million. The utilities and technology partners will provide the added \$89 million, Battelle said.

Key to the project is a technology known as transactive control, demonstrated in an early form on Washington's Olympic Peninsula three years ago (SGT, [Jul-28](#)). Transactive control will play at least some role in every utility's project as it assigns values to power as it passes through the grid and creates incentives for efficient flow of that power, Melton told us yesterday.

For example, if one transformer is over-burdened and another is under capacity, the former will have incentives to shed load and the latter to pick it up. The technology is often discussed in

terms of electricity's "cost" at various points in the system but it does not depend on the implementation of real-time tariffs, Melton stressed. It is meant to supplement, not replace, existing D&T control and safety systems.

The utilities on the grant are "ready to hit the ground running" once the final grant contract is negotiated with the DOE, Melton said. Then two years of design and implementation follow plus two years of operation and a final year of data analysis and reporting. But updates on how the project is faring will be released informally over the five years at conferences and through standards-development efforts, he added.

The project's locations, with their corresponding utilities, are:

- Idaho: Idaho Falls Power in Idaho Falls;
- Montana: Flathead Electric Cooperative in northwest Montana and NorthWestern Energy in southwest Montana;

- Oregon: City of Milton-Freewater, BPA in Portland and Portland General Electric in Salem.

- Washington: Inland Power & Light in Airway Heights, City of Ellensburg, Peninsula Light in Fox Island, Benton PUD in Kennewick, Avista Utilities in Pullman and Seattle City Light at the University of Washington, and

- Wyoming: Lower Valley Energy in the western part of the state.

Technology and other vendor partners include 3TIER, Areva USA, Drummond Group, IBM, Netezza and QualityLogic.

AEP to avoid new generation

AEP Ohio is to see \$75.2 million for its GridSmart demo project that we first reported on in September (SGT, [Sep-02](#)). "We're working to provide customers with real-time information about their energy consumption," in part to help them use energy more efficiently and to help the

utility "avoid new generation capacity," Karen Sloneker, director of customer services & marketing for AEP Ohio and project director for GridSmart, told us yesterday.

AEP Ohio will test the integration of DG resources and energy storage devices and it will seek to improve cyber security of AMI and DA equipment, she added, noting that the PUC of Ohio authorized AEP to recover from power consumers \$54.5 million for GridSmart.

Project partners include GE, community energy storage specialist S&C Electric, Lockheed Martin and Battelle -- paying about \$20 million to get to the \$75 million match.

"There's an increased interest in cyber security and we will partner with [Lockheed Martin] to develop a cyber security operations center hosted at our offices in Columbus, to move cyber security into the future -- to be able to deal with evolving technologies," she added.

What sets Columbus, Ohio-based AEP's project apart is integration of many technologies "and the demonstration of all of those technologies in a single geographic area," Sloneker said. "We're also looking at providing DOE with a workforce planning model."

AEP sees jobs being "much more technical in nature" and requiring "a combination of skills that are not present in the utility industry today," Sloneker said. "For example, I think people are going to need to have a combination of telecommunications expertise, business knowledge and technical/analytic skills combined," she added.

Management of the distribution system "is going to be very different, said Sloneker. "Today, we have essentially one-way communication but with these new technologies, we'll be able to dispatch generation at distributed points out on the distribution circuit -- perhaps be able to shed load, depending on circuit capacity issues ... so we'll be able to call for customers to change their consumption patterns and implement new technologies that will manage volts and VARs in real-time." VAR is volt-ampere, a measure of power in an AC circuit.

AEP expects its project to take 42 months. It will begin conversations with DOE this month and it envisions an installation period of 18-24 months plus a monitoring and operations period. In the end, the \$150 million project should be completed in May 2012, she added.

AEP delivers power to over 5 million customers in 11 states thus what AEP

1 story in 0.5 minutes

East meets West in

smart grid switches: Xiamen Huadian Switchgear of Xiamen, China, is partnering with engineering firm Operation Technology of Irvine, Calif, to offer switch gear controllable by Operation Technology's ETAP (Electrical Transient Analyzer Program) Real-Time software, the firms told the press yesterday. Under the partnership, Huadian will make ETAP Real-Time a product in its AMS iSub product

line. That will create substations that can be programmed to perform tasks as needed by management, engineers and operators, the firms said. When substations are networked with the ETAP Enterprise Solution, they can be managed at the substation or network level including real-time monitoring, simulation, playback, automation, optimization, intelligent load shedding and reporting of power flows, voltages and energy use.

[\[Comments\]](#)

Ohio learns in its demo project will naturally be shared widely as an internal matter plus with DOE.

The project includes AEP Ohio customers in a 150-square-mile area representing urban and rural central Ohio communities.

Within the project area, AEP Ohio will try to cut energy use by 18,000 mwh and peak demand by 15 mw over a three-year period.

Battelle tested pricing options in conjunction with Pacific Northwest National Laboratory, a federally funded R&D center that Battelle manages. "We'll be working with [Battelle] to design the demonstration project in such a way that we can engage as many consumers as possible and keep them involved," Sloneker said.

Battelle also brings to the table GridLab D -- that AEP Ohio plans to use to simulate "the impact of things like plug-in hybrid electric vehicles," she added, noting that a fleet of 10 is in planned. "We'll take the data from those 10 vehicles and model the impact on, perhaps, an entire distribution circuit."

Why GridSmart vs smart grid?

"Our company has chosen that name to brand this concept," Sloneker said. "For AEP, GridSmart is kind of an over-arching umbrella for improving

energy efficiency from our generation plant all the way through to the end-use customer."

Beacon flywheels go to Chicago

Beacon Power, of Tyngsboro, Mass, won \$24 million to build the firm's second 20 mw flywheel energy storage plant -- aimed at an as-yet-undetermined 3.5-acre site in Chicago.

The grant was "the most significant financial boost Beacon has ever received from the federal government," Bill Capp, Beacon's CEO, told the press yesterday. He said it "underscores the unique value and stabilizing benefits of our grid-scale flywheel systems."

Flywheels such as Beacon's provide frequency regulation, absorbing power when the grid has too much and storing it as kinetic energy. When the grid needs its power back to meet demand, the flywheels inject energy back into the grid thus helping to maintain proper power frequency of 60 cycles/second.

Flywheels recycle power and act as "shock absorbers" to the grid, thus supporting integrating renewable-yet-intermittent wind and solar power resources, Beacon noted. Unlike conventional fossil fuel-powered generators that provide frequency regulation, flywheel plants do not use fuel

or produce CO2 or other air pollutants, the 65-person firm said.

Beacon's new plant will house 200 flywheels -- 10 mw. It will likely be built in an industrial zone close to a substation or transmission line, spokesman Gene Hunt told us yesterday, noting that the firm hasn't yet set construction or completion dates.

Though other flywheels exist in the US, "they're not doing anything at the grid scale," Hunt said. "They're doing 100 kilowatts, 200 kilowatts, providing back-up power for 30 seconds or acting as battery substitutes."

Beacon has not set a start or projected end date for the plant. It plans to assess the plant's success by revenue return "first and foremost" and also by emissions avoided, Hunt said.

An external engineering firm chosen by DOE will monitor all the grant projects, including Beacon's but Hunt said the DOE made awardees promise not to name the firm.

Publicly traded Beacon would like to fund the added \$24 million required for building from sources other than its own coffers, though it will also seek partnerships, Hunt said.

EDITOR'S NOTE: Our coverage of the demonstration project grants is set to continue next week.

[\[Comments\]](#)

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Abbreviations: To see a glossary of *Smart Grid Today's* abbreviations, go to www.smartgridtoday.com/glossary.

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