

# OpenADR's Steps Toward a National Smart Grid Standard

The marketplace for Smart Grid technology products is expanding thanks in part to an open-source communications specification developed by Lawrence Berkeley National Laboratory (Berkeley Lab) and its research partners.

The OpenADR communications specification provides a common “language” for developers of technology for the Smart Grid. OpenADR allows building control systems to respond automatically to Internet-based signals that provide electricity grid prices and reliability messages.

Building controls take pre-planned steps to reduce electricity use in a process called automated demand response (Auto-DR), which is a significant enabling technology of the Smart Grid. Berkeley Lab, through the Demand Response Research Center (DRRC), has been leading a multi-year research program to demonstrate AutoDR, in cooperation with California utilities, and funded by the California Energy Commission’s Public Interest Energy Research program.



**Mary Ann Piette is Deputy Head, Building Technologies Department, EETD.**

One of the technical requirements to make Auto-DR possible on a large, national, scale is a common “language” for these signals, so that building control software and hardware products made by any company can all communicate with each other. OpenADR is the specification developed by Berkeley Lab researchers, led by Mary Ann Piette, and their partners, including start-up company Akuacom.

Together with Pacific Gas and Electric, Southern California Edison, and California’s other investor-owned utilities, they developed and demonstrated the OpenADR specification in California’s grid. Piette is the Deputy Head of the Building Technologies Department of Berkeley Lab’s Environmental Energy Technologies Division.

As an open-source specification, any company can make products conforming to OpenADR.

### **Honeywell Acquires Akuacom**

In mid-May, Honeywell announced that it would acquire Akuacom. This is one of several recent developments that moves OpenADR closer to playing a key role in the Smart Grid as the basis for communications among products from Smart Grid technology vendors. Honeywell and Akuacom are among more than 30 energy management and control systems vendors that offer products based on OpenADR.

“Many major controls companies, utilities and grid systems operators have deployed OpenADR-based programs that reduce peak electric demand by tens of megawatts,” says Piette, who is also the Research Director of the Demand Response Research Center at Berkeley Lab. “Honeywell’s acquisition of Akuacom is one of many recent developments that further solidifies OpenADR as a national standard and enables multiple vendors, utilities and ratepayers to deploy tens of billions of watts of automated demand response nationwide.”

Honeywell is one of the largest building controls companies in the United States, and its products are widely used in both commercial and residential buildings. Akuacom is one of several companies offering software and hardware products that incorporate the OpenADR information exchange model. It started conducting research and field-testing with Berkeley Lab in 2005.

### **New Products Based on OpenADR Introduced**

The private sector has been introducing new hardware and software products incorporating OpenADR into the marketplace. Recent product announcements from such companies as Tendril, Residential Control Systems, BuLogics and Our Home Spaces have expanded OpenADR into residential and small commercial applications. The products include hardware devices and visual displays that link to the grid and provide automated demand response capabilities to homes and businesses.

Smart grid projects are underway in Quincy and Tallahassee, Florida that use

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OpenADR as the communications specification. Several utilities, including NVEnergy, (serving Nevada, including Las Vegas, and northeastern California), the Bonneville Power Administration (serving the Pacific Northwest), and the Sacramento Municipal Utility District have all identified OpenADR as the communications specification to follow in their Smart Grid plans.

OpenADR is in use in a commercial building project by National Resources Canada. The California Independent System Operator, which oversees California's electricity grid, is conducting a project to integrate renewable resources into OpenADR. Researchers at Berkeley Lab have also responded to interest from South Korea and India in using OpenADR in their Smart Grid planning.

In 2009, OpenADR was selected by the National Institute of Standards and Technology (NIST) and U.S. Department of Energy (DOE) as the basis for smart grid demand response communications over the Internet. NIST is developing a smart grid standards roadmap for the nation that incorporates OpenADR.

"The interest that the private sector is showing in OpenADR, and in Berkeley Lab's automated demand response research generally, demonstrates that this technology is ready for broad adoption in the marketplace," says Piette.

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