

On August 3, the Association of Home Appliance Manufacturers (AHAM) announced that major appliance manufacturers and a coalition of energy and water efficiency advocates had voluntarily agreed to support proposed new efficiency standards, production tax credits for super-efficient appliances, and inclusion of smart-grid readiness as a feature of future Energy Star-qualified appliances.

According to AHAM, the standards could save more than two and a half trillion kilowatt-hours of energy over the next 30 years.

An innovative aspect of the plan (which recommends the standards to the Department of Energy and the Environmental Protection Agency sooner and at higher levels than likely would come through a contested rulemaking) is that it would relax the Energy Star efficiency requirement for a “smart” appliance—one with “smart” communication capabilities—by 5 percent. The purpose of the smart efficiency credit, along with tax and consumer incentives, is to spur manufacturers. “We see a potential benefit in the credit,” says Jan Berman, senior director for integrated demand-side management, policy and integrated planning at PG&E, “because it would give wider availability to smart grid-enabled appliances.”

This innovation recognizes the declining marginal contribution of the most efficient Energy Star products, balances it against the rising marginal cost of producing these models, and theoretically steers markets toward products that deliver societal benefits through their “smart” capabilities.

Due to the relatively modest lifespans (generally 10 to 15 years) of major appliances, says Tom Catania, Whirlpool’s vice president of government relations, “a significant percentage of the appliance stock turns over within 10 years, so with the right incentives, the scale impact of these products could grow quickly.” It will be a world of “ubiquitous demand response (DR)-ready appliances.”

The Potential of Ubiquity

Ubiquitous DR that allows customers to automate responses to price or load-control signals could change what’s possible for utilities. “Once smart grid-enabled appliances are widely available,” says Berman, “utilities will have the opportunity to design programs to capture the benefits. The programs would be similar to existing air-conditioning cycling programs, but with a larger potential market addressing more seasons and time periods.”

Right now, it is not cost-effective to offer incentives for load control on appliances other than central AC, pool pumps, and water heaters. But the scale of response made by thousands of refrigerators, for example, that slightly change defrost or ice-making cycles simultaneously could help avoid substantial amounts of peak demand at a much lower cost to utilities and with virtually no customer impact.

For customers concerned about privacy or having their

SMART APPLIANCES AND UBIQUITOUS DR

By Lisa V. Wood,
executive director of the Institute
for Electric Efficiency.

own control over automation, Catania says that manufacturers have no interest in compromising customer satisfaction, and that consumers will always retain control of how appliances in their home respond to utility requests.

Through ubiquitous DR, mass market smart appliances can benefit the grid by increasing reliability and optimizing

grid management. Even without DR, smart appliances can deliver what Catania calls “the Prius effect.” Dishwashers and clothes dryers that display both energy usage and price information create conservation—the information makes consumers more conscious of the costs of their decisions.

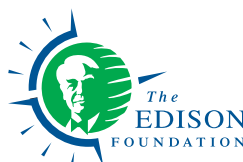
The Uncertainty of Implementation

Some of the obstacles to achieving ubiquitous DR are technical. Smart grid interoperability standards are under development, and system architecture and data communication protocols remain issues for utilities. Many smart meter systems are not designed with appliance communication in mind. While it is possible to integrate it into existing systems, the changes to infrastructure and back-office technology could be costly. The uncertainty about costs, as well as the difficulty of measuring and anticipating savings, complicates matters. It also remains to be seen whether customers will want or need separate control technologies to coordinate smart appliances, or if the control intelligence should be fully automated through the appliances or the meter.

“It is as yet unclear what the full value proposition is for smart appliances from the utility perspective,” says Val Jensen, vice president for marketing and environmental programs at ComEd.

Other obstacles are regulatory. Many smart appliance benefits depend on the availability of dynamic electricity prices or some type of load control signal. In general, regulators have been reluctant to embrace dynamic pricing for the mass market. In part, this is because dynamic pricing requires customers to change behavior to realize benefits. It is probably true that a robust market for smart appliances could provide regulators with real-world evidence of customer demand—and the greater the ability of systems in the home to respond automatically to dynamic prices, the less behavior change required of customers. But it is unclear what level of customer demand commissions need to see.

Whatever the uncertainties, energy standards are effective ways to save energy and strengthen the market for smart technologies. This agreement on smart appliance standards is a major opportunity to advance both EE and DR. ♦



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