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Smart Meter Fact and Fiction

The smart meter is a rising star located at the heart of many hopes regarding the future of energy consumption, but what exactly does it mean to be "smart?"

July 24, 2009

Everyone seems to be crying out to the oracle smart-meter, hoping it will share with them some secret information that will help them solve their energy problems. What appliances are hogging the most energy? Can I use energy at off-peak times to save money? If the United States had more smart meters deployed, would it solve the energy crisis? These are just a few of the questions that pursue the smart meter wherever it goes.

Will the smart meter help consumers use energy more efficiently? Maybe. But the first thing to get straight is what a smart meter actually does. According to EPRI (Electric Power Research Institute), www.epri.com, Palo Alto, Calif., smart meters are not all alike. "There isn't a dictionary definition, or one definition that everyone would agree to on what it is that constitutes a smart meter," says Brian Seal, senior project manager for Intelligrid, EPRI.

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According to Seal, what people mean by a "smart" meter has changed over time. He explains, at first a smart meter was simply one that

collected time-of-use or interval data, but would store that data in the meter until a meter reader accessed it once a month. But if Seal had to put a definition on what most people think of as a smart meter today, he says it likely would be a meter that enables two-way communication between the meter and the utility company.

However, a smart meter alone can't tell which appliances are consuming the most electricity or the cost of energy at various times. But a smart meter is often a necessary component in enabling the systems that can do those things. Experts say it is these systems that hold the most promise for provoking real change in our energy-use habits.

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In recent months, the market has seen many announcements regarding smart meter deployments. A number of analyst firms have released

projections about how many smart meters will be deployed, and how long it will take.

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forecasts the number to reach about 76 million in 2009. ON World, www.onworld.com, San Diego, Calif., says there could be more than 100 million new smart meters installed worldwide over the next five years. Parks Associates, www.parksassociates.com, Dallas, Texas, believes the number of smart meters deployed in the United States alone is already more than 8 million, or about 6% of meters.

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Making sense of these numbers can prove challenging, especially because it can be tricky to determine what is classed as a smart meter, in its

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true definition, and what isn't. Instead of speculating about the numbers being deployed, it may be more useful to look at how these more advanced meters are changing the industry.

Seal says the real shift is one from meters that lasted for 20 or more years to meters that may be changed out much more often.

"What has really happened is we stepped across a line where the very long service life electromechanical meters have given way to a much more dynamic marketplace and a much more dynamic product whose life is shorter-lived, not because of a physical limitation of the technology, but because of a more rapidly changing set of requirements by the utilities," he says.

Technology and functional changes look to drive utilities to upgrade meters more often, which could create a sustained market for adding or changing meter functionality. There is not a line in the sand with non-smart meters on one side and smart meters on the other. Rather, there are many levels of meters with different capabilities, even within the "smart meter" category.

Seal adds that these cycles of new meter deployments have happened before. "And so everything that we marked off 10 years ago as having already been converted is (now) back in play, because it means converting again now, because they were one-way communicating devices and now we need to make them two-way communicating devices. And I could say the same thing about the early two-way communicating devices, that maybe they did communicate two-way, but now they're in need of updating again because maybe they're missing that connectivity into the premise, or the disconnect switch, or just communication speed, or (one of) many other performance characteristics."

When looking at the future of smart metering in the United States, it's also important to consider what the business cases will be for the utilities. Because each state in the U.S. has its own laws and regulations, the deployment numbers may vary greatly by state.

Diego Klabjan, associate professor, Northwestern University Dept. of Industrial Engineering and Management Sciences, has long conducted research on the business value of various technology implementations, including smart meters. He says, "The most progressive utilities and states (California) are definitely on track with their deployments, i.e. they are not falling behind their predicted numbers."

He adds as with many new technologies, smart metering ROI (return on investment) is a concern for utilities, even though some of the deployment costs are being passed on to consumers.

"They (utilities) are only scratching the surface when it comes to the benefits and thus they have a hard time justifying the investments," says Klabjan. "Benefits are particularly hard to find in states with very weak deregulations since their hands are tied when it comes to influencing the consumers (e.g., changing their behavior through rate changes). More deregulated states will definitely lead the pack and continue with their large deployments. More regulated states will see slower adoptions."

Smart meter deployments will no doubt impact the way consumers use and pay for energy, but where they live may play a large role in how fast these changes occur. One thing EPRI's Seal says to keep in mind is that much of the way this will all work is still a big experiment.

"The industry as a whole is working to discover that which works well," he says. "And because the human element is involved, and habits and behaviors associated with that, these are not experiments you can run in just a few weeks or just a few months and really learn anything. It's going to take many years to understand what it is that makes our industry the most efficient and the most reliable."

The day when the meter is the magic portal providing access to a wealth of previously unknown information about energy use may be coming, but when it will be a reality for the individual consumer remains to be seen.



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