

# Getting Smart About Smart Meters

Starting with: What are they, anyway?

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**W**ith utilities planning to install smart meters in about 10 million U.S. homes and businesses, lots of people are wondering how these devices will change the ways we consume and pay for electricity. Concerns about privacy, reliability and costs are common, too.

Here are answers to some of the biggest questions for consumers:

## What makes a smart meter so smart?

A smart meter measures a household's electricity usage in short increments—say every five minutes or every hour. A wireless link sends the usage data to the utility in near real time and tells the customer the current price being charged for that power—during peak or off-peak hours—which could be an incentive to turn off some lights or appliances.

The latest smart meters are designed to be able to control appliances expected to hit the market in the next few years that will help consumers reduce bills and make homes more energy-efficient.

## Which utilities are planning to install smart meters?

Too many to list. But about 15 plan deployments this year of more than 50,000 smart meters each, according to Pike Research, in Boulder, Colo.

Among the largest deployments: **Alliant Energy Corp.**, of Madison, Wis., is replacing about 1.4 million electricity and natural-gas meters with advanced ones in Iowa, Minnesota and Wisconsin; **Duke Energy Corp.** plans to install 80,000 smart meters for electricity and 58,000 for gas this year in Ohio, and eventually will add 700,000 electric and 450,000 gas meters in that state. Baltimore Gas & Electric has plans to install two million electricity and gas smart meters, including some this year.

## How will smart meters change the way I'm charged for electricity?

Many utilities plan to use the meters to charge different rates based on the time of day, in an effort to make rates more closely reflect the cost to the utilities of delivering that power. The idea is to encourage consumers to use less electricity when demand is typically highest—on a hot summer afternoon, for example—by increasing the rates charged for those periods.

If people use less electricity at peak times, utilities won't need to turn on expensive backup power plants and may not need to build new ones, saving money and reducing total emissions.

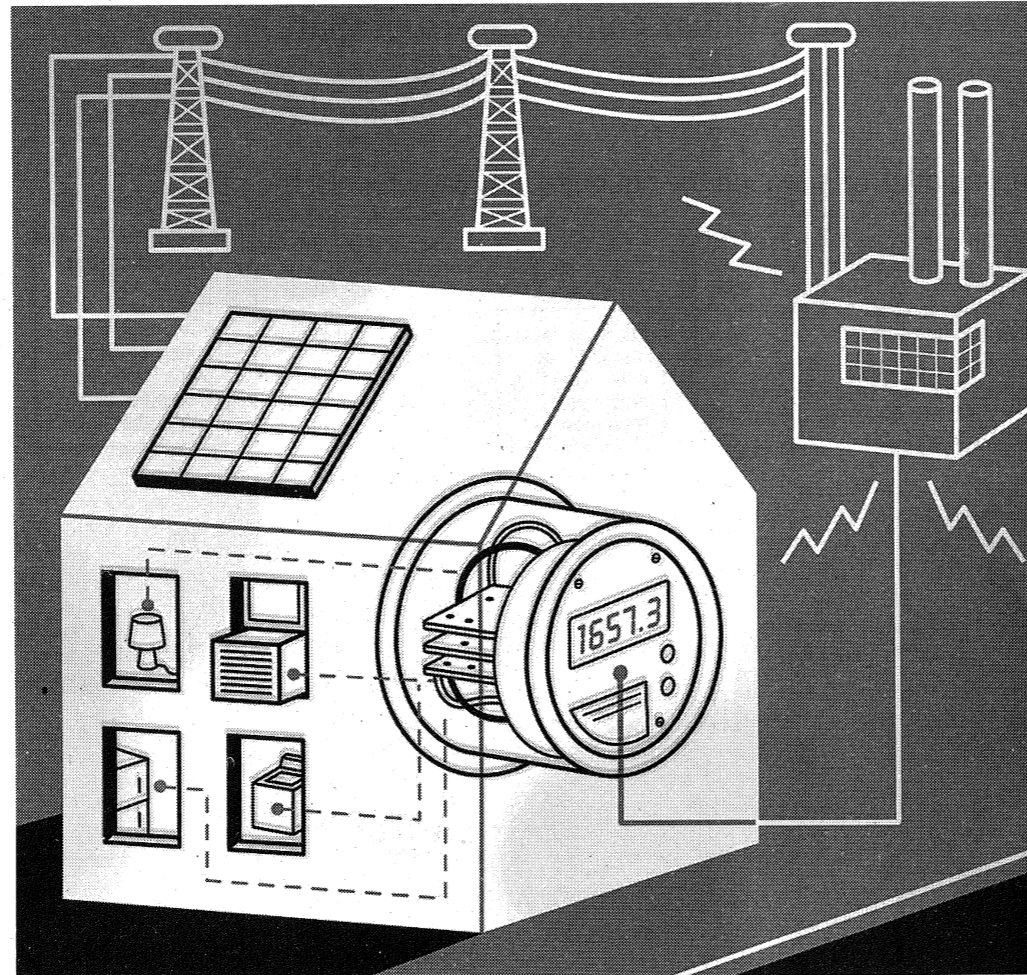
## How would this work?

Utilities are testing various new pricing methods. Some would give you a rebate for every kilowatt-hour by which you reduce your peak power consumption from your typical peak levels. Connecticut Light & Power, a unit of **Northeast Utilities**, found that customers who were put on such a rate reduced electricity use about 11% during peak times.

But this method is less effective than one that punishes customers by raising rates during peak times, even as it rewards them for using power off-peak. **Pacific Gas & Electric Co.** has a voluntary program for its smart-meter customers: an increase of 60 cents per kilowatt-hour during peak times, and a discount of 3 cents per kilowatt-hour in off-peak. About 2,400 customers signed up for the program in the summer of 2009, according to a PG&E spokesman. And of those who were on the program in 2008, about 90% of them signed up again in 2009, he says.

Connecticut Light & Power found that customers on a similar pricing plan, with discounts and higher rates, reduced their peak power consumption by about 16%.

## Will smart meters make



## I want to monitor my electricity use closely. Will a smart meter help me do this?

Yes, but there are gadgets and Web applications that let you do that, too. For example, **Energy Inc.** sells a device that goes inside your circuit breaker and measures the amount of electricity coming into your home as you use it; that information is then sent to a display unit that has real-time information on power use. The device doesn't require a smart meter.

For those customers who have a smart meter, some utilities have implemented services that enable you to check your usage. Florida Power & Light allows customers to check their daily usage on the company's website. Customers of San Diego Gas & Electric can sign up for **Google Inc.'s PowerMeter** software, which provides real-time electricity usage information online or on a smartphone.

## Could I use smart meters to automatically adjust my power consumption using controls in the home?

Within a few years, it should be possible to program appliances to run at times of day when rates are lower.

The idea is for advanced smart meters in the home to give the appliances price signals that tell them when to turn on. So you would preset, say, the dishwasher to run today when the price falls below a certain amount. The dishwasher will do the rest.

Appliances with chips that communicate with smart meters are still in the works but may be available as soon as next year. No specific plans have been announced by manufacturers.

## What else could a smart meter help me do?

It could help regulate how your solar panel sells power back to the utility. It could also ensure that your electric vehicle charges at a time when there's sufficient power available. The meters are critical for those uses, should renewable energy and electric vehicles become widespread.

## my monthly bill go up or down?

Many utility companies contend that a full smart-meter program will save costs: by reducing the need for them to buy high-priced peak power from electricity producers; by making new power plants unnecessary; and by lowering operating expenses, such as for manual meter reading and for house calls to connect or disconnect service.

In theory, shifting some electricity usage to off-peak hours could help customers lower their bills. In a pilot program conducted last summer by Connecticut Light & Power, customers who used time-based pricing saved an average of \$15 over three months, compared with the usual flat rate.

But some customers ended up paying more: About 30% had a higher bill than they would have had under their usual flat rate, according to

the utility. A time-based rate structure is most likely to increase costs for those who already use little electricity and don't have room to cut more, or for consumers who don't (and perhaps can't) change their behavior.

Another reason bills may increase: Most utilities will impose a small surcharge to pay for the smart-meter rollout. For instance, residential customers in Ohio will get a charge of as much as \$1.50 a month this year, going up to \$3.25 per month next year.

## What are some concerns about smart meters, and how are they being addressed?

Because the meters are part of a network, in theory someone could hack into the system and turn off your power, send misinformation to the utility or steal data about your energy use. Security companies have demonstrated that they

can hack into smart-meter systems, but so far no breaches have been confirmed.

For now, it's up to each utility and its state regulator to ensure that security concerns are being addressed. There is no federal security mandate for smart meters, according to George W. Arnold, national coordinator for smart-grid interoperability at the National Institute of Standards and Technology, a nonregulatory agency of the U.S. Department of Commerce tasked with promoting standards among various industries.

But smart-grid projects that are competing for the \$800 million in federal grants under the stimulus program would have to meet strict cybersecurity guidelines. The standards institute and other groups are working on a set of recommendations for state utility boards and the Federal Energy Regulatory Commission.