

SDG&E has thinking cap on for future

'Smart grid' to promote better production, usage

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Would you like an electric bill like the one you get from the cellular company, with peak and off-peak pricing?

If it were cheaper, would you let the power company adjust your thermostat or decide when your dishwasher runs?

Would you be willing to adjust your power usage based on Internet updates?

Those questions are in the offing because of “smart meters” that San Diego Gas & Electric Co. is installing.

The meters are part of a set of technologies called the “smart grid” for homes, substations and power plants. The basic goal is to make, distribute and use electricity more efficiently.

At its heart, a smart grid changes the way electricity is produced, transmitted and used by adding a nervous system to a setup that still runs much like Thomas Edison's first utility in New York City in 1882.

Gadget enthusiasts see the smart grid as powering home automation. Utilities look at it as a way to better manage the power system. Environmentalists think of it as a way to promote rooftop solar power.

For most people, however, the biggest change will come from the addition of the smart meters, which will allow the power company and residents to track electricity usage on an almost real-time basis.

That will make the information more useful than simply seeing how fast the disk inside the meter is spinning.

Workers began installing the first of 1.4 million meters in SDG&E's region last month in a two-year, \$572 million project. SDG&E serves San Diego County and a portion of southern Orange County.

Other utilities are following suit. In 2006, smart meters served 1 percent of electricity customers nationwide. By the end of 2008, it was nearly 5 percent, according to the Federal Energy Regulatory Commission.

The point is to be smarter about power usage and production, said Don Felsing, chief executive of SDG&E's parent company, Sempra Energy.

Things won't change right away. Technology that links the smart grid to devices in your home isn't ready yet. Felsing compared the smart meters to information networks that link computers.

Just as there are Internet applications today that were inconceivable before computers were linked, "there will be benefits that today I can't describe," Felsing said.

Many of those benefits come from letting residents know that it costs much more to produce electricity on a hot summer day than in winter.

During times of peak usage, more power plants are needed – plants that are idle most of the time but still must be financed and maintained.

The meters can shave the peaks by letting users know how much power costs and how much they're using. They also will let customers give the power company control over certain appliances. Together with other sensors, they also will help the company better manage the grid.

That translates into fewer power plants, Felsing said.

A core part of the project is to give people a reason to use less power during the peaks. SDG&E says it would like to charge residents more for peak power. It can't do so right now, in part because state law forbids it. The company says it would like the law changed.

The other reason peak pricing isn't in place is that SDG&E doesn't know when people use power, something the smart meters will be able to monitor.

The meters will collect and store data on usage every 15 minutes for businesses and every hour for residential customers. Then, three times a day, they will send the information to the utility's computers. The company will then make that information available online to customers the following day.

"The goal is to provide a key piece of information to allow customers to see, in essentially real time, the energy that they're using, and to make changes in their behavior to reduce energy use and save money," said SDG&E spokeswoman Stephanie Donovan.

It will cost customers about \$2.50 a month beginning in 2011, but they should save at least that much on their power bills because of increased efficiency, Donovan said.

Some of the most promising changes involve information that SDG&E won't ever see.

For instance, the meters eventually will communicate with devices in your home to give you a more detailed picture of electricity consumption than you could get from the utility.

Every 15 seconds, the meters will send a scrambled radio signal to be read by gadgets inside

your home. Displays will be able to tell you how much electricity you're using at any given time and how much it's costing.

They also could indicate how much power is from natural gas, nuclear plants, solar panels and wind turbines.

Think of it as a dashboard for your home, said Matt Smith, a spokesman for Greenbox Technology, a company working with utilities on how to display this information on computer screens and handheld devices.

That information gives people the power to act, said Michael Shames, executive director of San Diego's UCAN, the Utility Consumers' Action Network.

“It now injects a whole degree of intelligence into the electric system,” Shames said. “It's no longer a one-way system. It's a two-way system.”

And it's not just dashboard-style displays that will use the scrambled signals.

SDG&E is adopting ZigBee, a wireless standard that will work with a variety of big power-using appliances, from smart thermostats to pool pumps, washing machines and water heaters.

Then, acting on the scrambled signals from the meters, appliances could be set up to power down when electricity is scarce and expensive.

The smart appliances aren't available yet, but companies such as General Electric are planning to roll them out soon.

Something like this is available for small-business and residential customers. People who sign up for the “Summer Saver” program agree that in exchange for rebates, SDG&E can shut off their air conditioners during power emergencies. That system relies on radio-controlled air-conditioner switches.

Most commercial or industrial customers in San Diego already pay more for power they use during the peak days than the rest of the time, said Mark Gaines, SDG&E's director of customer programs. Many are set up to power down when electricity is in high demand.

SDG&E is proposing a “peak-time rebate” in which customers get money back for using less energy during emergencies, but their rates won't skyrocket if they don't take part.

“Customers can't be hurt by it,” Gaines said. “It's sort of the carrot-and-no-stick approach.”

While power savings will come from customers backing off, other efficiencies will come in the way the system is run.

For instance, the smart meters will tell SDG&E of outages right away. That means the company won't have to wait for a customer's phone call. For 40 percent of its customers, the utility doesn't

know about outages until it gets a call.

“It will help us identify where there's power outages, where there are problems,” said David Geier, SDG&E's vice president of electric transmission and distribution.

For SDG&E, the meters supplement another set of equipment sensors, which send back information almost in real time.

Technicians will know where the transmission bottlenecks are and route power around them. They will know when equipment needs replacing.

The smart grid will also help producers better match demand.

Historically, power plants have been steady affairs. Whether powered by burning fuel such as coal, oil or natural gas; by water flowing through turbines; or by the heat from nuclear reactions, the people running the plants could control how much power is produced.

Not so with technologies such as solar and wind, which by law must provide a larger slice of California's energy in coming years. The sun doesn't always shine. The wind doesn't always blow.

“We really need a smart grid to control those and use those effectively,” Geier said. “If the wind stops or the clouds come over, that's the real challenge.”

A smart grid will help deal with changes in power production and demand seamlessly, said Steve Hauser, a former SAIC manager whose new company, GridPoint, is helping utilities on smart-grid projects.

“It's kind of paradox,” Hauser said. “If you turn a light on and off in your house, or office or whatever, the grid, the system, the guys that are running the power delivery system, it's not going to make one hoot of difference whether you turn that light on or off.

“But in the aggregate, if 100,000 users turn that light on or off, it makes a huge difference.”

Staff writer Anne Krueger contributed to this report.