Saving on utilities just takes gazing into a crystal ball

By Paul Davidson, USA TODAY

Wait! Before you turn on that dishwasher, break out the calculator.

That's a snapshot of a new energy-conserving future in the USA, one that Trina Camping and Mike Lewis are already living.

Several times during last summer's heat waves, the Woodland, Calif., couple got a phone message from Pacific Gas and Electric (PG&E) warning that midday electric prices the next day were going to skyrocket. When the peak hours arrived, "We would turn the air off completely and go around and turn off computers, and if our toothbrush and cellphone chargers were plugged in we'd take them out," says Camping, 29.

By scrimping during the most expensive hours of the day, the couple have trimmed about $30 off their monthly power bill.

They're among a growing number of power customers equipped with advanced, or "smart," electric meters that allow them to pay different prices at different times of the day. It's called "time-of-use" pricing, and it saves money for most people. In a California pilot program, 70% of consumers cut their monthly bills an average of about 10%. Some saved much more.

The trend is part of a conservation movement fueled by soaring power demand, an overtaxed electric grid and a desire to curb power plants' carbon dioxide emissions because of global warming.

While some big factories have paid fluctuating power prices for a decade, digital meters are increasingly being doled out to consumers and businesses. Some customers are actually getting paid to throttle back electricity on particularly steamy days, when the power grid is under the most strain.

With time-of-use prices, rates are typically highest midday when power demand peaks and lowest in the wee hours when usage ebbs. That prods consumers to cut back on air conditioning, for instance, on torrid afternoons when the grid is stressed, or defer energy-guzzling tasks, such as laundry, to later in the evening.

Customers can continue to pay the flat rates they do today, but most have been shown to save money with flexible prices. Congress, in the Energy Policy Act of 2005, ordered regulators in every state to consider advanced meters. Utilities in California, Texas and Illinois are rolling them out widely, and pilot projects are planned or underway in New Jersey, Washington, D.C., and Baton Rouge, among others.

Smart meters are installed in about 6% of U.S. homes and business, according to a survey by the Federal Energy Regulatory Commission. By the end of 2012, 40% of all customers in the USA will be hooked to advanced meters, says research firm UtiliPoint. About a third of those will likely opt for flexible prices, and another third may pay them some of the time, predicts Chris King, chief strategy officer for software firm eMeter.

The concept isn't groundbreaking. Airlines, hotels and cellphone carriers bump their prices up or down as demand ebbs and flows. Electric companies similarly have always paid ever-shifting wholesale prices for power. Utilities also face high costs to build, and fire up, "peaking" plants that operate only the 10 to 15 stifling summer days when electricity usage soars. Fifteen percent of generating capacity is devoted just to that 1% of annual hours.

Yet power companies charge nearly all customers a constant rate that averages out those peaks and valleys. That's largely because standard meters can ring up only a customer's total monthly usage. Smart meters that measure consumption in 15-minute increments have been around about 10 years, but utilities have been slow to deploy them. The meters and related equipment cost upwards of $100 per household — expenses that are passed to consumers through slightly higher rates, says Dan Delurey, head of the Demand Response and Advanced Metering Coalition.

"Some might see this as a newfangled way of shaking money out of consumers' pockets," says Richard Sedano of the Regulatory Assistance Project, which advises state regulators.

A need for conservation

New pressures, however, are tipping the scales toward conservation. Electricity demand is projected to soar 19% the next decade, while the most cost-efficient way to generate electricity, coal plants, face the prospect of expensive taxes as Congress moves to curtail global warming.

Meantime, the nation's aging power network is buckling. The Northeast blackout of 2003 was largely blamed on a strained transmission grid, while heat-related blackouts in California and New York last summer were pinned on decrepit equipment.

One increasingly popular alternative to building new plants and lines is to shave usage, especially on the handful of "critical peak" days, typically in the summer, when the grid is most vulnerable. Current fixed pricing "doesn't give people any incentive to reduce (peak) demand," says Bob Lieberman, a member of the Illinois Commerce Commission.

For the California utilities, which are spending $3.5 billion to install 16.5 million meters by 2012, most of the savings are from lower operating costs. Smart meters, for instance, let utilities read usage totals, spot outages and connect and disconnect customers — all remotely. PG&E plans to lay off its 900 meter readers.

There are also wider benefits for the grid. By easing strains in the summer, "It will allow us to reduce or eliminate rotating blackouts," says Paul DeMartini, head of advanced metering for Southern California Edison. Debra Reed, CEO of San Diego Gas & Electric, says the meters are "worth it to customers because it saves the investment in peaking plants."

PG&E says the savings will offset costs in 12 years. All its customers will initially pay an extra 49 cents to 99 cents on their monthly bills to fund the devices. Some other utilities charge only those who choose variable pricing up to $5 monthly.

Automation is making it easier for people to participate. Camping has a "smart" thermostat that's set at 80 degrees most of the time in the summer but automatically drifts to 95 when prices rise between 2 p.m. and 7 p.m. Her pool pump last summer was programmed to run only during off-hours. Plus, she says, "We do all of our laundry and dishes overnight."

Last summer, Camping and Lewis went on the Internet at work and adjusted their thermostat and pool pump when they wanted to override the settings. "We could say, 'I want the house to be cooled off when I get home,' or 'I want to sit in the hot tub.' "

During the daily peak hours, the couple pay 3 cents more than the flat rate charged most state residents, which is about 15 cents-per-kilowatt hour. But they pay 3 cents less than the flat rate all other times. On critical peak days, their power costs 60 cents a kilowatt hour. Overall, they've trimmed their average monthly bill about $30, to $200.

Florida man cut his bill in half

Charles Mabius, who lives in Panama City, Fla., along a sweltering bayou, saves even more, halving his average $325 monthly Gulf Power bill. He cools the house summer mornings, priming the thermostat to automatically shut off in the afternoon. "I never really think about it," says Mabius, 72.

On critical peak days in the summer or winter when the rate jumps to 33 cents a kilowatt hour, a red light flashes on the thermostat.

Jill Amoni, 54, of Aurora Ill., gets even more specific data from a glass orb in her living room. It morphs into six different colors in response to wireless signals, from blue (lowest) to red (highest), to reflect shifting prices. That's because Illinois is one few area where wholesale prices, which change constantly, are passed directly to customers. Most utilities with smart-meter programs charge set prices for each time period, approximating wholesale rates.

"I love saving money, and I love having control," Amoni says of the program, launched by the non-profit Community Energy Cooperative. "Plus, I'm helping the environment."

Even small reductions can yield big benefits. If just a third of all U.S. customers shaved their peak power usage 10% to 20%, it would drive down wholesale prices, let utilities avoid up to $19 billion a year in capital investments and eventually slash electricity prices for everyone by 6%, King says.

While energy-efficient appliances can cut utilities' profits, making them hesitant to promote the devices, they're somewhat more receptive to flexible pricing. That's because most of consumers' savings are from shifting usage to cheaper periods, not conservation, says Bill Prindell of the American Council for an Energy Efficient Economy. Still, those on flexible prices do become stingier, using about 4% less energy, King says.

Not everyone is sold. Bob Finkelstein, head of the Utility Reform Network, a San Francisco consumer advocacy group, contends that smart meters are overkill in California, where 40% of residents live near the ocean and rarely use air conditioners. Meanwhile, he says, a lot of customers, including the poor, "are going to get to pay higher bills" to fund the gadgets.

"Telling people to shift their air conditioner usage to late at night or early in the morning kind of misses the point," he says." "You need it when it's hot out."

While consumers must sign up for flexible pricing, some California regulators are urging utilities to encourage wider adoption by putting customers on the plans and forcing those not interested to opt out.

The prices, however, don't suit every climate. Puget Sound Energy in Washington installed advanced meters in 2001 but discontinued time-of-use prices in 2002 after most customers saved less than $2 a month. The utility serves a region bounded by mountain ranges and water that's less vulnerable to heat spells, says Puget spokeswoman Dorothy Bracken.

In heat-prone areas, consumers are not just nudged by savings to shift usage off peak. Many are paid by utilities to cut back on the hottest days to protect the grid. A 48-unit Manhattan co-op netted $5,000 last summer for paring demand up to 42% five days last summer, says Peter Junk Jr., a resident who organized the program. A homeowner typically can earn $20 to $30 a summer for adding a switch that lets a utility cycle the air conditioner less often on critical-peak days.

Such automation is also key to consumer acceptance of the meters. While today's smart thermostats are programmed to rise or fall at certain times, utilities in the future will send dynamic prices directly to thermostats, water heaters, even dishwashers. If the price is high, a red light might appear on the washing machine, delaying the wash until prices dip or at least warning the consumer.

"It has to be automated," says Clark Gellings, vice president of the Electric Power Research Institute. "Most people are not going to sit there and wait for a signal."