

Who's Saving Electricity in Your Neighborhood?

Software company Opower thinks it can get consumers to use less electricity by instigating some friendly neighborhood competition.

By Kevin Charles Redmon

Opower has made energy conservation a matter of keeping up with the Joneses. (Illustration by Andy Potts)

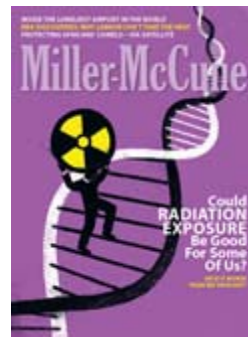
It was late afternoon at Opower headquarters in Arlington, Virginia, but the energy start-up's hive mind was thrumming steadily.

"Let's take a walk," said Marc Laitin, senior director of consumer marketing. "I think best when I'm moving."

Laitin is a typical Opower manager — Harvard educated, safely under 40, animated like a street theater puppet, and dressed like he was going to a Decemberists' concert. He set off down the hall on a talking jag, punctuating his ideas with wild arms. He wanted to make an idea about turning down the heat in winter go viral. People forward funny emails all the time, he posited. Could his idea work by word of mouth?

We came to a bare conference room — its floor still raw concrete — that looked out over the Potomac. "How do we get people talking about conserving energy?" Laitin wondered aloud. "How do we generate hype?"

He began to build a meme. Winter meant the holidays, and the holidays meant ugly sweaters. What if Opower sent every homeowner an ugly sweater? Too expensive, and Midwesterners might not get the joke. What if the company instead sent tiny ugly sweaters, designed to be worn by the home's thermostat? Tiny things are



cute, and cheap. If done right, it would make the neighborhood chatter mill go bonkers.

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Opower — an information software company founded in 2007 as Positive Energy — is a young group of computer engineers, social scientists, and Silicon Valley vets. Thanks to an infusion of \$50 million in venture capital in late 2010, the company was in the midst of a massive build-out during my visit last summer, doubling its team with 100 new employees. Around the office, yoga balls and standing desks took the place of cubicles. A glassy kitchen was stocked with Odwalla juices, craft beers, and an espresso maker. A running ticker on the wall showed kilowatt-hours saved nationwide — 300 million and climbing. Everywhere, the intensity hovered between hungry and frenetic, all trying to solve a single problem: How do you convince homeowners to use less electricity?

The answer proves to be remarkably old-school.

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Getting people to use less electricity is a quandary that has plagued utilities and environmentalists alike for decades, and previous attempts to crack it have resulted in some costly failures. The Age of Smart Meters, which provide up-to-the-minute data on energy use, has brought little revolution; the technology is expensive and — let's be honest — you don't have the free time to log on to your utility's website and parse graphs detailing of your monthly kilowatt-hours. Psychologists have long understood that humans are miserable at opting in, which is why gee-whiz iPad apps showing every circuit in your house have been slow to gain traction. Utilities running small pilot programs for in-home monitors — which provide real-time feedback on energy use and retail for around \$120 — have found that use of the device can lead to significant reductions, but only in some homes. And persistence is fragile, too; the novelty of the gadget wears off or the batteries run out, and replacing them is a hassle. In one study, nearly one-third of the participants never bothered to set up their monitors. In another, 35 percent said they planned to discontinue use after the trial.

Last summer presented a stark reminder that some technologies arrive ahead of their time: on June 24, Google announced that it was mothballing PowerMeter, a tool designed to give users with smart meters the ability to monitor their energy use online. Growth had been sluggish, and utilities were reluctant to allow Google access to their data streams, making it impossible to scale. Six days later, Microsoft announced that its energy management portal, Hohm, would likewise be scrapped.

To fill the void — and to make a tidy profit — Opower has married high-tech number crunching to low-tech behavioral psychology to produce “home energy reports” that are sent directly (yes, snail) to your mailbox with your electricity bill. Opower algorithms sift through data streams provided by your energy company and compare your monthly electricity use to that

of 100 hypothetical “neighbors” — houses similar to yours in size, age, and location.

The highly stylized report, simple and colorful, includes your monthly “Neighbor Rank,” from 1 to 100: a graph shows your consumption in relation to the average, with language that affirms downward trends and warns against upward ones.

In essence, Opower has made energy conservation a matter of keeping up with the Joneses.

Behavioral psychologists call this kind of tactic “normative messaging.” It works because, as highly social creatures, humans are both attuned to how others *act* and sensitive to what others *approve* — even when we claim not to be.

Robert Cialdini, a regent's professor emeritus of psychology and marketing at Arizona State University, and author of the 1983 business classic, *Influence: The Psychology of Persuasion*, demonstrated this with a series of “door hanger” experiments in San Marcos, California. Researchers first identified four ways to conserve energy: take shorter showers, turn off unnecessary lights, use fans instead of air conditioning, and turn off the AC at night. They then drafted appeals for each action, according to one of five conditions: environmental protection (“protect the environment by conserving energy”); social responsibility (“do your part to conserve energy for future generations”); self-interest (“save money by conserving energy”); information only (“use a fan to conserve energy”); and descriptive norms (“join your neighbors in conserving energy”). Every week for a month, researchers hung new messages on doors of several hundred randomly selected homes and checked the homes' electrical meters. At the end of the trial, they calculated whether energy use had risen or fallen and interviewed 371 homeowners about their experiences.

Homes that received messages that appealed to the environment, social responsibility, and financial self-interest, as well as the information-

only control group, all used *more* electricity after receiving the door hangers than they had previously. The only homes that used *less* were the ones bombarded with descriptive norms: “77 percent of San Marcos residents often use fans instead of AC in the summer. Fans are your community’s popular choice!”

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Cialdini — who sits on OPower’s advisory board — has repeated this and similar experiments a number of times. What’s remarkable is how consistently homeowners fail to predict which messages will motivate them. Time and again, interviewees assert that descriptive norms — indicating what their neighbors are doing — will have no bearing whatsoever on their own behavior. And they announce that environmental and social responsibility appeals will be far more effective in changing their habits. In practice, nothing matters so much as keeping up with the Joneses.

Opower’s home energy reports build on this central truth by making descriptive norms — our perceptions of what most others actually do — impossible to ignore. The Neighbor Rank feature is particularly hard-hitting. “I love it, and consumers love it,” said Ogi Kavazovic, Opower’s vice president of strategy and marketing. “It gives you a number. You are No. 67. And importantly, it gives you your movement from month to month. There’s a competitive angle. There’s a pattern.”

And, the reports rely equally on injunctive norms — our perceptions of what most approve — to guard against what psychologists call “the boomerang effect.” A 2008 study by Wesley Schultz, co-authored by Cialdini and others, showed that when high-energy-use homeowners were told they consumed more power than their average neighbor, they reduced their use; conversely, when low-use homeowners were told they consumed less than average, their use spiked — the message boomeranged. The researchers found that by simply adding smiley faces — injunctive norms — to the low-users’

reports, validating good behavior, they could all but kill the effect.

Opower borrowed the technique wholesale. “Good neighbors” now get a smiley on their reports. “Very good neighbors,” the best one in every 10, get two.

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Because electricity is invisible (try to visualize a kilowatt-hour) and adds up by the cent, it’s not an easy business product to tackle. “Energy efficiency is boring,” said Kavazovic. “For most customers, it’s just too much work for too little benefit. That’s been the theme perennially.” And there’s no money to be made directly in teaching households to conserve. So Opower makes its tidy profit by selling its services to utilities, especially the behemoth investor-owned ones. Twenty-six states now have long-term efficiency standards, across-the-board reductions that utilities are required to meet. And more states are adopting them. A company like Pacific Gas and Electric wants to stay compliant — as cheaply as possible. Upgrading infrastructure, subsidizing in-home monitors, and performing energy audits are expensive.

Indeed, a 2009 McKinsey study revealed the full extent of Americans’ paradoxical affair with energy. By investing \$520 billion in energy efficiency, households and businesses could reap \$1.2 trillion in savings and reduce their consumption nearly a quarter. Yet no one will pay the up-front cost.

Having Opower mail home energy reports costs little more than the price of a stamp.

Kavazovic adds, “Most customers will say, ‘Yeah, that would be cool if my energy usage analysis just *appeared* in front of me.’ So what we made was a product that just appeared in front of them. They opened the mail, and there it was.”

Kavazovic admitted that there but for the grace of Marc Solomon, an employee with mass-marketing expertise, went Opower. “When we

started the company, we were a bunch of software guys. Our immediate instinct was, let's put up a Web portal." But Solomon had worked for Capital One and knew something about consumer engagement. "He told us, 'This portal looks great. It's a great idea. How about the other 95 percent of people that are never going to come to it?' We all looked at each other and said, 'Oh, wow. We better do some mailings.'"

Partnering with utilities — rather than sidestepping them, as most Web portals do — gives Opower access to a wealth of tightly controlled data. With smart meters, that information gets even more granular. It's an academic's dream: continuously randomized, controlled studies. Hunt Allcott, an economist at NYU, has made extensive use of the data. A recent study tracked 600,000 households across the country for two years; and a subset of those households received home energy reports. Allcott found that, in the months after reports were mailed, average consumption dropped 2 percent. Households that were initially high-use showed the biggest reductions (more opportunities to save), but even low-use households made reductions, not gains. For every kilowatt-hour abated, the utility paid a little more than 3 cents — roughly a tenth of the cost paid for every kilowatt-hour saved when rolling out in-home monitors.

"There's no substitute for a large-scale field trial," Kavazovic told me. "One of the advantages we have is access to millions of homes, and we're able to do A/B tests" — that is, controlled tests — "with slight modifications to messages. A lot of things we try don't make any difference. It's kind of like panning for gold."

Surprisingly, when Kavazovic and his team initially cut their incoming data, looking for trends and nuances, they were most struck by what they didn't find. Profiling along the traditional attitudinal lines that advertisers use — soccer moms, greenies, dincs — no segment performed statistically better or worse. They all began to conserve equally, FOX and MSNBC viewers alike.

"When we went back to Robert Cialdini about it, he wasn't shocked at all," said Kavazovic. "He kind of smirked and said, 'That's the power of normative messaging.' It's universal. Whether you admit it or not, whether you're a tree hugger or a coal miner, we all respond to what we perceive to be normal behavior. We're all interested to hear what our neighbors may be doing."