

Smart Policies for a Smarter Grid

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President Obama's vision for economic recovery centers on creating "green collar" jobs through substantial investment in clean technologies. Upon signing his "green stimulus" bill in February, Obama touted a \$4.5-billion provision to "create a newer, smarter electric grid that will allow for broader use of alternative energy."¹ Despite the clear benefits of giving the electricity grid its first major upgrade since the 1950s, few proponents have addressed the obvious questions: Why did the nation's infrastructure grow so obsolete, and are we setting the stage for another six decades of stagnation?

Unlike other technology investments in the administration's \$787-billion stimulus package, such as next generation broadband, nothing about smart grids is particularly "futuristic." Making the electricity grid "smart" means merely creating the same experience already expected for nearly every piece of consumer technology in modern society. When users browse the Internet, for example, they expect to view the pages they request, only when they request them. When mobile customers make a call, they can instantaneously check how many minutes they've used, and how many they have left.

If these technologies worked like the electricity grid, however, Internet browsers would have no control over the pages they visit, and mobile customers could only learn how many minutes they've used by having a company representative visit their house every month to read a dial inside their cell phone. While the Internet and mobile networks adapted and evolved with incredible speed, the electricity grid stood still, and offered little if any choice. This lack of spontaneous innovation is puzzling.

Nearly every American demands electricity, creating an enormous market for innovators. If entrepreneurs developed advanced communications tools to make the grid more adaptive and responsive, both consumers and energy producers should predictably embrace them. Consumers, for instance, could monitor energy price fluctuations in real time and run major appliances during periods of low demand. Greater transparency means greater control, and ultimately lower costs. Energy producers could more efficiently attract and serve customers. More efficiency means better service, greater market share, and ultimately higher profits. Many of the nation's leading technology firms see the promise of this untapped market.

In October, 2008, Cisco declared the smart grid its next potential billion-dollar business opportunity.² Google formed a partnership with General Electric to promote smart grid technology, and in February, 2009, Google introduced a free software application called PowerMeter, "which will show consumers their home energy information almost in real time, right on their computer."³

Tax credits also continue to drive private investment in renewable energy startups, despite the economic downturn,⁴ but investors understand that many projects cannot succeed without a smarter grid. For this reason, smart grid and energy efficiency firms raised \$272 million in the third quarter of 2008, overtaking biofuels as the second-highest category for clean technology venture capital investment.⁵

Despite strong consumer demand and private investment, why has the nation's electricity infrastructure failed to change or evolve in 60 years? Something on

the grid has been short-circuiting innovation. Innovators cannot freely compete to bring their products to market as long as large government-sheltered monopolies literally hold all the power. Because the government grants electric utilities complete immunity from competition, consumers have no avenue to demand new technologies on the grid, and entrepreneurs have no avenue to deliver them.

Competition drives choice and innovation. Today, consumers can visit billions of pages on the Internet and choose between countless wireless providers, plans, and devices. On the electricity grid, however, they can purchase only a single product, from a single provider, at a single price. As monopolies, utilities have little incentive to invest spontaneously in new infrastructure. What if consumers could select from competing “electric service providers,” just as they do for Internet service providers or wireless carriers?

In a unanimous vote, the California legislature attempted to give consumers this freedom in 1996. Facing the highest electricity rates in the nation, lawmakers authorized residents to bypass the utilities and purchase power directly from independent producers. Upon signing this bill into law, Gov. Pete Wilson declared that “direct access” to alternative suppliers would “pull the plug on another outdated monopoly and replace it with the promise of a new era of competition.”⁶

Only months after the law took effect, energy innovators began invoking the same aspirations and creativity as their dot-com counterparts in Silicon Valley. Energy entrepreneur (and current president of the California Public Utilities Commission) Michael Peevey boasted in July, 1998, that “my company can use ‘smart’ meters for each customer that record and report electricity use on a real-time basis.”⁷ In 1999, Bay Area startup Utility.com launched “the first Internet utility company,” and offered customers “a quick and easy way to buy, track and manage energy” conveniently on their PC.⁸

While competition could have ushered in such smart grid technologies more than a decade ago, this promise proved short-lived. An energy capacity crisis in 2000-2001 led the legislature to suspend “direct access” until 2015. Consumers do not blame competi-

tion for this crisis, and actively seek more products and choices. Proposition 80, a 2005 ballot measure, sought to eliminate direct access permanently. Two-thirds of Californians rejected it, however, voting instead to endorse the return of competitive energy markets.

Choice gives consumers the power to vote with their wallets. If they demand cleaner energy, they can buy from renewable sources. If they demand higher quality, they can purchase premium products. If they demand lower prices, they can shop for the cheapest power. For customers grandfathered into the direct-access system before its suspension in 2001, this choice has resulted in substantial savings. The University of California, for instance, has saved more than \$30 million in the past decade by shopping around for the best energy deal.⁹

Proposals to create a smart grid today are built on a contradiction. Smart grid technology centers on empowering users to *choose* how they consume energy within a monopolistic utility system that doesn’t allow choice. Recognizing that choice must be restored for new technologies to develop, Governor Schwarzenegger declared in 2006 that “restoring direct access in order to increase competition and lower prices to retail electricity customers is a cornerstone of my Energy Action Plan.”¹⁰ The California Public Utilities Commission also voted 4-1 in May, 2007, to begin exploring ways to revive direct access without action from the legislature. According to CPUC president Michael Peevey (a Democrat), “it continues to astound me”¹¹ that anyone would oppose more choice and competition. “We have choice in most anything in our lives,” Peevey explains. “It is one of the hallmarks of the capitalist system. Why would you single out electricity and say it is uniquely different?”¹²

Even though three regional monopolists supply 68 percent of California’s energy,¹³ Obama’s \$4.5-billion commitment to smart grid technology forces state officials to move forward in the absence of choice or competition. The CPUC initiated a proceeding in December, 2008, “to consider smart grid technologies pursuant to federal legislation” and “to actively guide policy in California’s development of a smart grid system.”¹⁴ To begin the process of attracting federal investment, the Commission will hold a workshop¹⁵ on March 27 and a full-day “smart grid symposium”¹⁶ on April 21.

Even if regulators seek to spur creativity by funding many innovators and ideas, most new products will never reach the market. Monopolies, and not consumers, ultimately pick winners among competing vendors and technologies. Without choice or competition in the electricity market, utilities will dole out exclusive contracts for building and maintaining the smart grid. Because large bureaucracies resist risk, they will shun promising startups in favor of established firms. Just as the government protects utilities from competition, utilities protect smart grid contractors. As these companies become entrenched monopolies, immune from competition, the smart grid could experience the same long-term stagnation that afflicted the current infrastructure over the past 60 years.

The CPUC may attempt to avoid this stagnation by selecting the best technologies and standards, but no amount of central planning can substitute for consumer choice. The current system actively discourages choice. The price controls imposed by regulators do not compensate for lack of choice, and such controls further restrict choices in behavior. Why would most consumers choose to conserve energy during periods of high demand if prices always remain the same? The smart grid could empower consumers to adjust behavior based on real-time price fluctuations, but such incentives cannot coexist with highly regulated, government-protected utilities.

As the CPUC decides how to spend California's share of the \$4.5 billion national smart grid investment, regulators and utilities will make critical and irreversible strategic decisions. Rather than allow consumer demand to shape the future direction of smart grid technologies, time constraints on funding could force policy makers to engage in central planning. This creates an incentive for special interests to lobby for policies that favor particular companies, technologies, or business models. Companies may claim that their policies promote openness and competition, but any government preference will ultimately pick winners and losers in a rapidly evolving market.

Internet search giant Google, for instance, submitted comments to the CPUC requesting that all information on the smart grid about a person's electricity use "be made available (with permission from the con-

sumer) to third parties in a standardized, open format—i.e., a format that is standardized, freely published, and unencumbered by a patent or proprietary claim." Appealing to a desire for more choice and competition, Google claims this policy will "foster a thriving ecosystem of partners where third-parties develop and provide products to help consumers decrease and manage their energy demand and save money."¹⁷ This strategy, coincidentally, meshes perfectly with Google's business model.

The company gives away its products for free, and then generates revenue by advertising to users. By mandating open access to detailed information about how and when consumers use electricity, Google can sell lucrative, highly-targeted advertisements without any cost to the company. Not every technology innovator, however, follows this model. Many companies do not sell advertisements but instead patent their inventions and sell licenses to users. When such companies license to anyone at reasonable rates, this approach is no more or less "open" than Google's, but merely represents an alternative business model.

A number of the nation's leading high-tech innovators depend on this model, and are already developing their own smart grid solutions. On March 3, a trade group representing technology pioneers including Cisco, HP, IBM, Intel, and Microsoft testified before a U.S. Senate hearing on "Revamping the Energy Grid with New Technologies" how it is "critical" to develop a smart grid policy that "fully respects both pre-existing intellectual property rights and new intellectual property."¹⁸ Though companies may assert that technology preferences or mandates can bolster consumer choice, they are actually asking regulators to make choices on consumers' behalf.

For all their power, regulators cannot possibly predict how new technologies will develop. Only an open and competitive market can provide the flexibility for sustained innovation. Central planning rarely succeeds in correctly guessing consumer demands, and commonly triggers massive investment followed by years of stagnation. All the ingredients are present to spark a wave of lasting creativity in smart grid technologies. If that is to become a reality, consumers and entrepreneurs, not government, must generate the creative energy.

Recommendations

- 1) Create Competition in Electricity Markets: The legislature should end its suspension of “direct access,” allowing consumers to bypass utility monopolies and purchase electricity on the open market. As providers compete for business, they will quickly implement new technologies and choices that best meet consumer demands. Competition among electricity providers will spur experimentation with a diverse array of smart grid innovations and business models. It will also provide incentives for consumers to generate their own energy, and sell excess power back to the grid. Direct access creates nearly unlimited opportunities for entrepreneurs with creative ideas to bring their products to market. When these ideas compete, consumers will have the ultimate authority to shape how energy is produced, used and stored both in California and nationwide.
- 2) End Price Controls for Electricity Providers: After restoring competition in electricity markets and freeing consumers from monopoly providers, the CPUC should end price controls on electricity rates. The adoption of smart grid technologies requires the flexibility and incentives for consumers to adjust behavior with fluctuating market demand. If prices cannot change with market conditions, consumers will not seek greater control over their energy use, and producers will not continually upgrade infrastructure to implement smarter technologies.
- 3) A Smarter Grid Starts at Home: Central planning forces regulators to guess which technologies, products, and services will best meet the demands of millions of consumers in a constantly changing market. What happens if they guess wrong? If the government rushes to pick winning standards for the smart grid, they risk sticking consumers with an expensive system built on fundamentally inferior technology. As a result, consumers fail to embrace this technology, and neither regulators nor producers have an incentive to dismantle the project and begin anew. This is a recipe for waste and stagnation. If consumers instead shape which technologies win and lose in an open and competitive

market, the best products will prevail. Therefore, the drive for smart grid upgrades should radiate from the consumer. According to a February, 2009, survey conducted by IBM, four out of five respondents would use smart grid technologies to achieve significant cost savings, and 65 percent would potentially pay more for renewable energy options.¹⁹ Google’s recent introduction of PowerMeter demonstrates that innovators are building the tools to help consumers express these demands. As “home area networks” for electricity become as popular as Wi-Fi Internet hotspots, grid operators will rapidly innovate to meet consumer demands for more choice, flexibility, and control.

- 4) An “Open” Grid Means Open Competition: To gain an unfair advantage in the rapidly developing smart grid market, companies will lobby for regulatory policies that benefit their business model and exclude competitors. By labeling their strategies “open,” some firms may assert that eliminating competitors actually enhances competition. In reality, many competing strategies can be equally “open,” and regulators must refrain from picking winners and closing the door on competition.

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Endnotes

- ¹ Remarks of President Obama at signing of American Recovery and Reinvestment Act, Denver Museum of Arts and Science, February 20, 2009.
- ² Cisco Selects Winner of Global I-Prize Innovation Contest, Cisco Systems Press Release, October 14, 2008.
- ³ Ed Lu, “Power to the People,” Official Google Blog, February 9, 2009.
- ⁴ “Clean Technology Venture Investment Reaches Record \$8.4 Billion in 2008 Despite Credit Crisis and Broadening Recession,” Cleantech Group Press Release, January 6, 2009.
- ⁵ <http://greenlight.greentechmedia.com/2008/10/07/silver-spring-gets-75-m-as-smart-grid-rolls-on-630/>

- ⁶ Dan Morain, “Deregulation Bill Signed by Wilson; Utilities: Law will Make Electricity Providers Competitive by 2000. Firms will Cut Residential Rates But Can Add Charges to Recoup Bad Investments,” *Los Angeles Times*, September 24, 1996.
- ⁷ Michael Peevey, “Lights Out for Regulated Utility Monopolies,” *Wall Street Journal*, July 14, 1998.
- ⁸ “IdeaLab! Launches Utility.com—First Internet Utility Company,” Utility.com Press Release, March 22, 1999.
- ⁹ Marc Lifsher, “A New Bid to Loosen Energy Laws; State PUC Wants to Let Users Pick Providers. Some Tie Deregulation to The 2000-2001 Crisis,” *Los Angeles Times*, December 8, 2008.
- ¹⁰ http://gov.ca.gov/pdf/press/sb_423_sign.pdf
- ¹¹ Shane Goldmacher, “PUC to Look Into Deregulation; That’s Legislature’s Job, Top Lawmakers Say as Plan Evokes Memories of Energy Crisis for Some,” *Sacramento Bee*, May 25, 2007.
- ¹² Shane Goldmacher, “Critics Rip PUC Energy Stance; Deregulating the Market May Get a Second Look,” *Sacramento Bee*, May 20, 2007.
- ¹³ <http://energyalmanac.ca.gov/electricity/index.html>
- ¹⁴ California Public Utilities Commission, “Order Instituting Rulemaking to Consider Smart Grid Technologies Pursuant to Federal Legislation and on the Commission’s Own Motion to Actively Guide Policy in California’s Development of a Smart Grid System,” Rulemaking 08-12-009, December 18, 2008.
- ¹⁵ <http://docs.cpuc.ca.gov/efile/RULINGS/98065.pdf>
- ¹⁶ <http://docs.cpuc.ca.gov/efile/RULINGS/98328.pdf>
- ¹⁷ Michael Terrell, “Comments of Google on Smart Grid Technology Deployment in California, California Public Utilities Commission,” Proceeding R08-12-009, February 9, 2009.
- ¹⁸ Katherine Hamilton, “The GridWise Alliance, Revamping the Energy Grid With New Technologies,” testimony before the Senate Energy and Natural Resources Committee, March 3, 2009.
- ¹⁹ Michael Valocchi, John Juliano and Allan Schurr, “Lighting the Way: Understanding the Smart Energy Consumer,” IBM Institute for Business Value, February 19, 2009.