



Source: Silver Spring

What consumers need to know about the smart grid and smart meters

America's outdated energy system is wasteful, expensive, and a huge source of pollution. Over the next 10 years, utilities will have to invest hundreds of millions of dollars to modernize our electricity grid, most of which is past the age of retirement. By making smart investments in a "smart" green grid, we can enable significantly greater use of clean, renewable energy, non-polluting electric vehicles, and community-based resources. That will improve air quality and the health of millions of Americans¹ now harmed by dangerous air pollution while advancing our energy independence and economic growth.

The diverse benefits of a smart grid

1. Save thousands of lives

People whose primary concern is human health have compelling reasons to support the smart grid. The smart grid can cut air pollution from the electric utility sector as much as 30% by 2030. That would reduce what is now the tragedy of more than 34,000 deaths a year from power plant pollution, more lives than are lost on U.S. highways. Dirty air also worsens asthma and lung disease, especially among children and the elderly, with more than 18 million acute respiratory symptoms annually.

2. Lower utility bills

With easy-to-use tools—such as simple online displays of the information smart meters provide about use and prices and set-and-forget home energy management tools—consumers will be able to make choices that lower bills and shrink their environmental footprint.

3. Economic and job growth

The clean energy industry is one of our fastest growing sectors, with venture capitalists, utilities, and businesses investing billions in domestic solar, wind, energy efficiency, smart grid, and electric vehicle companies and projects. Between 1998 and 2007, clean energy jobs in the U.S. grew by 9.1 percent, while total jobs grew just 3.7 percent. All told, 770,000 people were working in 68,200 fast-growing businesses spread across all 50 states.²

4. More reliable service through shorter and fewer outages

A smart grid uses sensors and communication to pinpoint and fix problems, often before they happen. When black-outs do occur, power can be restored quickly, keeping businesses up and running and households comfortable and safe during storms and heat waves.

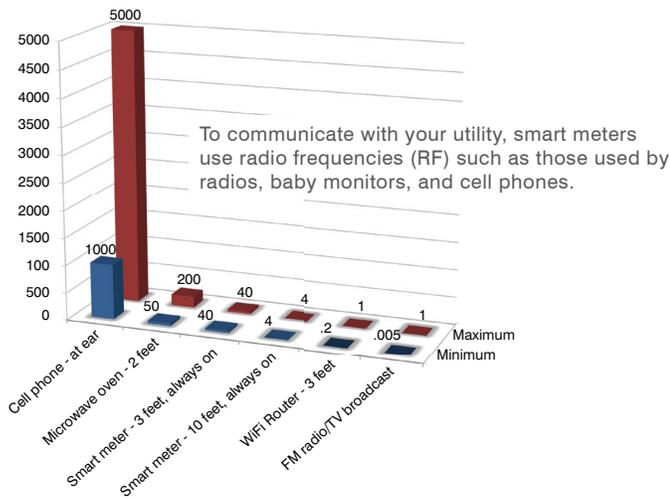
5. More clean renewable energy and less dirty fossil fuel

Because a smart grid can adjust demand to match intermittent wind and solar supplies, it will enable the United States to rely far more heavily on clean, renewable, home-grown energy: cutting foreign oil imports, mitigating the environmental damage done by domestic oil drilling and coal mining, and reducing harmful air pollution. A smart grid will also facilitate the switch to clean electric vehicles, making it possible to "smart charge" them at night when wind power is abundant and cheap, cutting another huge source of damaging air pollution.

1. American Lung Association State of the Air 2010 Report, <http://www.stateoftheair.org/>, found that more than 175 million people, 58 percent of the US population, suffer from pollution levels often too dangerous to breathe.
2. http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf

COMPARISON OF RADIO-FREQUENCY LEVELS FROM VARIOUS SOURCES IN $\mu\text{W}/\text{cm}^2$

Source: CCST January 2011 Report: Health Impacts of Radio Frequency From Smart Meters



The idea behind smart meters

Smart meters are key to realizing these benefits, because they allow for two-way, real-time communication that gives households and utilities the data they need to cut usage and costs. Here's proof from around the country:

- In Oklahoma, communities are benefiting from Oklahoma Gas & Electric's smart grid initiative, which the utility anticipates will push back the need to build a new fossil-fueled power plant until at least 2020;³
- In Maryland, the vast majority of customers in Baltimore Gas & Electric's Smart Energy Rewards program earned electricity bill credits for voluntarily reducing their electricity usage in the summer;⁴ and
- In Ohio, Duke Energy's grid modernization program has reduced the frequency and duration of outages and improved electricity bill accuracy.⁵

Nationwide, smart grid-enabled demand response will help eliminate the need for up to 2,000 dirty, inefficient "peaker" power plants.⁶

Putting RFs in perspective

Almost all wireless forms of telecommunication and electric household devices emit electromagnetic fields (EMF), including radio frequencies (RFs). RFs have been studied for years. Recently, the International Agency for Research on Cancer (IARC) of the World Health Organization (WHO) reviewed available research on cell phones, which use RFs similar to smart meters, but cause much higher levels of exposure. The agency identified cell phone use as "possibly carcinogenic," noting that "there could be some risk, and

therefore we need to keep a close watch for a link between cell phones and cancer risk."

Given that smart meters also emit RFs, some have worried that if cell phones may pose a health risk, smart meters might as well. As with cell phones, a person's exposure depends on the signal strength and distance: a report published by the California Council of Science and Technology (CCST) in 2010 included findings from the Electric Power Research Institute (EPRI) that a person 10 feet from a smart meter would experience very low levels of RF exposure—250 to 1,250 times less than exposure from using a cell phone.⁷ A more recent report from 2012 by the Public Utility Commission of Texas investigated a large body of research on the effects of low-level RFs. The Commission corroborated the CCST findings, and further concluded that there was no credible evidence to confirm the concern that advanced meters cause harmful EMF exposure.⁸

So whether or not future studies find that RFs present more concrete health effects, smart meters make up a very small part of a person's daily exposure.

Still, EDF supports addressing customer concerns proactively: utilities and regulators nationwide might, as in California, consider an opt-out provision that lets customers turn off the technology that transmits data (leaving the option for a future resident to turn the transmitter back on). They might also give serious consideration to alternative communication networks such as broadband, or the power lines themselves, to carry data, although those options present their own challenges.

We need a smarter grid now

EDF does not advocate merely any smart grid; we advocate a smart grid done right. A well-designed smart grid will drive the clean energy revolution we need—helping utilities reliably deliver power by securing our energy independence, improving our ability to vastly increase the amount of renewable energy and energy efficiency on the grid, growing our economy, and empowering consumers—all while protecting our air, water, and health.

3. American Recovery Reinvestment Act of 2009: Smart Grid Investment Grant Program. Progress Report II. October 2013. https://www.smartgrid.gov/sites/default/files/doc/files/SGIG_progress_report_2013.pdf

4. Innovations Across The Grid. The Edison Foundation. 2013. http://www.edisonfoundation.net/ei/Documents/InnovationsAcrossTheGrid_LoRes_InstElclnrv.pdf, page 138.

5. Duke Energy. 2011/2012 Sustainability Report. <http://sustainabilityreport.duke-energy.com/2011/innovative-products-and-services/power-grid-modernization-under-way/>

6. A National Assessment of Demand Response Potential. Federal Energy Regulatory Commission. June 2009. Page X. <http://www.ferc.gov/legal/staff-reports/06-09-demand-response.pdf>

7. Various parties disputed the CCST findings. In March 2012, the Michigan Public Service Commission tasked the Smart Grid Technical Advisory Project located at the Lawrence Berkeley National Laboratory to review the claims refuting the CCST results and found several technical and scientific flaws in the opposing arguments. <http://smartresponse.lbl.gov/reports/schsa.pdf>

8. Public Utility Commission of Texas. Report on Health and Radiofrequency Electromagnetic Fields from Advanced Meters. December 17, 2012. https://www.puc.texas.gov/industry/electric/reports/smartmeter/SmartMeter_RF_EMF_Health_12-14-2012.pdf

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