



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America's outdated energy system is wasteful, expensive, and a huge source of pollution.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 greatly reduce our use of dirty energy, improve air quality and the health of millions of Americans¹ affected by dangerous air pollution, and advance our energy independence and economic growth.

The diverse benefits of a smart grid

Modernizing our electricity system with information and networking technologies will allow us to diversify energy sources and eliminate enormous waste. The smart grid will be an "energy Internet" that transforms energy as completely as the information revolution transformed telecommunications, bringing us everything from cell phones to YouTube. A properly designed smart grid will help households and businesses reap many economic and environmental benefits, including:

1. 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

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. More reliable service through shorter and fewer outages

A smart grid uses two-way, real-time 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.

4. Cleaner air and improved public health

The burning of fossil fuels to generate electricity is one of the biggest sources of pollution and a major health threat. Dirty air causes alarming rates of asthma and lung disease, especially among children and the elderly. According to the EPA, the more than 20 million Americans suffering from asthma endure two million visits to the emergency room and 5,000 premature deaths, at annual costs of approximately \$14 billion each year.³ A smart grid will help clear our air, delivering huge benefits for public health.

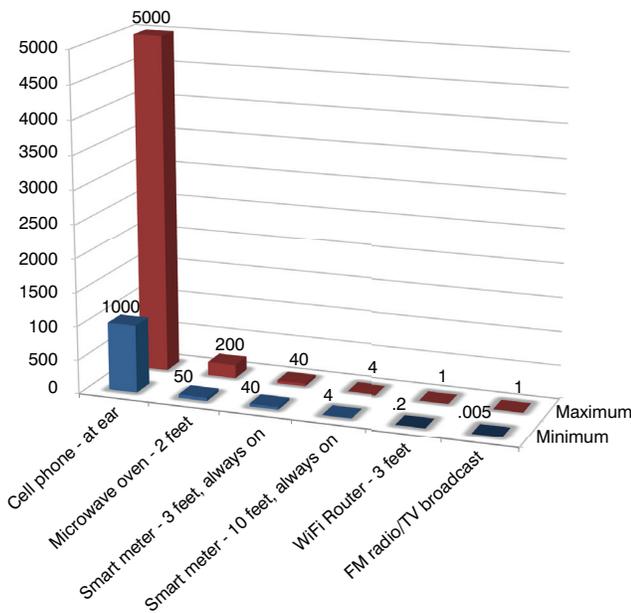
5. More clean renewable energy and less dirty fossil fuel

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.

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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 technology behind smart meters

Digital “smart” meters—capable of two-way communication between customers and electric utilities—are key to realizing all of these benefits. The only way we’ll be able to shift, on a large scale, to clean electricity and clean cars is with a smart network to plug them into. And the only way we will eliminate the huge waste throughout our whole energy system is if customers have real-time information about use and rates, and the power to reduce or shift that use: to cut costs and pollution.

Information flows between meters and utilities using radio frequencies (RF) such as those used by radios, baby monitors, and cell phones.

Putting RFs in perspective

Electromagnetic fields (EMF), including RFs, have been studied for years. The World Health Organization has found no evidence of health impacts from exposure to low-level EMFs.⁴ The Federal Communications Commission (FCC) has set guidelines to protect public health by establishing standards for safe levels of RF exposure.⁵ And the California legislature has established the non-profit California Council of Science and Technology (CCST) to provide impartial expert advice on scientific and technology-related policy issues, including radio frequency from smart meters.

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MIRIAM HORN

Director, Smart Grid Initiative

A person’s actual exposure to RFs from any source is a function of signal strength—which diminishes rapidly with distance—and amount of daily exposure. The CCST study found that even if smart meters were on 100 percent of the time, an individual’s exposure from ten feet away would be nearly zero.⁶ That is 250 - 1,250 times less than the exposure level from holding a cell phone to one’s ear, and significantly less than standing next to a microwave.⁷ Even if an individual was sitting directly on the other side of the wall from a meter, CCST concluded that he or she would be exposed to a very small fraction (0.03 percent) of the level established as safe by the FCC guidelines.⁸

We need a smarter grid now

A well-designed smart grid will improve our quality of life, grow our economy, and drive the clean energy revolution we need. It will empower consumers to manage their electricity use and save money, help utilities reliably deliver power, increase our energy independence, and help us compete in the global clean energy market—while protecting our air, water, and public health.

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
3. <http://www.epa.gov/asthma/about.html>
4. <http://www.who.int/peh-emf/about/WhatIsEMF/en/index1.html>
5. CCST Report (Pages 7-8), <http://www.ccst.us/publications/2011/2011smartA.pdf>, concluding that the FCC guideline is more than adequate to protect from potential thermal effects of RFs, the only effects that have been scientifically established.
6. CCST Report (Pages 18), <http://www.ccst.us/publications/2011/2011smartA.pdf>
7. CCST Report (Page 5), <http://www.ccst.us/publications/2011/2011smartA.pdf>
8. CCST Report (Page 7), <http://www.ccst.us/publications/2011/2011smartA.pdf>

For more information, please contact Mica Odom, Energy Media Director, modom@edf.org, (512) 691.3451

Environmental Defense Fund

44 East Avenue
Austin, TX 78701

T 512 478 5161

F 512 478 8140

edf.org

New York, NY / Austin, TX / Bentonville, AR / Boston, MA / Boulder, CO / Raleigh, NC
Sacramento, CA / San Francisco, CA / Washington, DC / Beijing, China / La Paz, Mexico

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