



## *Key Issues in Perspective:*

# SMART METERS and YOUR HEALTH

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The electric power industry is modernizing the nation's electric grid. Using advanced technologies, electric companies are building a smart grid that will deliver more reliable power to customers across the country and allow two-way communication between customers and their electric companies.

Installing smart meters is an important step in building the smart grid. Smart meters currently are being installed in homes and businesses across the country. Typically located on the outside of a building or house, smart meters enable customers to track their power usage and to learn more about the way they use electricity. This empowers customers to manage their electricity usage and use energy wisely.

Smart grid technology also allows electric companies to detect power outages more precisely and to restore power more quickly. In fact, some outages actually may be avoided by giving electric companies more options to reduce demand when the system is under stress. The meters also provide more accurate load data to electric companies, enabling them to plan and operate the electric grid more efficiently.

As with any new technology, customers have questions about how a smart meter works and what impact it may have on their lives. We've developed a series of frequently asked questions (FAQs) and answers to address key topics. The following FAQs discuss smart meter technology and your health. Some smart meters use technologies that transmit radio frequencies (RF) to provide communication between electric companies and their customers. While concerns have been raised about the potential impact of the RF generated by these smart meters, numerous studies have shown that smart meters using RF technologies pose no health risk. For additional information, please visit [SmartGrid.eei.org](http://SmartGrid.eei.org).

### ■ What is RF?

According to the Federal Communications Commission (FCC), "Radio waves and microwaves ... are one form of electromagnetic energy. They are collectively referred to as 'radiofrequency' or 'RF' energy."<sup>1</sup> Radio waves are used for telecommunications services; however, many common electric devices—including baby monitors and microwave ovens—also use radio waves.

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<sup>1</sup> Federal Communications Commission Web site, Office of Engineering and Technology, "Radio Frequency Safety," <https://www.fcc.gov/engineering-technology/electromagnetic-compatibility-division/radio-frequency-safety/fq/rf-safety>.

### ■ **How does a smart meter work?**

A smart meter is a digital upgrade to the decades-old mechanical meter found in homes and businesses across the country. A smart meter with RF technology uses a low-power radio to communicate the electricity usage of a home or business to the electric company through remote communication technologies. This means that your electric company no longer will need to send someone to read your meter on a regular monthly basis. Most homes already have electric devices that use RF signals, such as cell phones, microwaves, laptop computers, and televisions.

### ■ **Is the RF generated by smart meters hazardous to your health?**

**No.**

As with any electric device that utilizes RF, smart meters have been monitored, tested and certified to ensure they meet certain safety standards. The RF exposure levels from smart meters are far below the levels permitted by the FCC, which sets health standards for RF exposure, based on extensive reviews of the biological and health literature. The FCC limits on maximum permissible exposure to the general public created safety factors that are 50 times higher than the levels of known effects. The U.S. standards for radio waves are similar to those of the European Union and Canada.

According to the Electric Power Research Institute, the “relatively weak” strength of the RF signals generated by smart meters means that any impact of RF exposure would be minimal—similar to the levels of the exposure from televisions and radios.<sup>2</sup> In fact, smart meters produce significantly less RF exposure than other common electric devices, such as cell phones, baby monitors, wireless routers, laptop computers, and microwave ovens.

What’s more, RF exposure depends partly on the proximity of the RF source to a person. Smart meters are usually located on the outside of your house in a metal box, away from your daily routine activity. Due to the extremely brief exposure to the radio waves that smart meters produce, there have been no long-term health effects identified as a result of the installation of smart meters, according to a study conducted by the California Council on Science and Technology.<sup>3</sup>

### ■ **How does RF exposure from a smart meter compare to other electric devices?**

RF exposure from a smart meter is far below—and more infrequent—than other common electric devices. In fact, smart meters typically broadcast their signal for less than a minute at a time and usually less than a total of 15 minutes each day. The communication is usually from outside the customer’s home, so exposure to radio waves is minimal. In addition, the electric panel and wall behind the meter actually block much of the radio signal from entering the home.

RF is measured in units of microwatts per square centimeter. A microwatt is very small—it’s one-millionth of a watt.

- Held at your ear, a cell phone’s RF signal would be 1,000 to 5,000 microwatts per square centimeter.

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<sup>2</sup> "An Investigation of Radiofrequency Fields Associated with the Itron Smart Meter," Electric Power Research Institute, December 2010.

<sup>3</sup> "Health Impacts of Radio Frequency Exposure from Smart Meters," California Council on Science and Technology, March 31, 2011.

- Standing two feet from a microwave oven, the RF signal would be 50 to 200 microwatts per square centimeter.
- Standing 10 feet from a smart meter, the RF signal would be 4 microwatts per square centimeter.

Experts calculate that it would take 30 years of living with a smart meter to receive the same RF exposure that a typical cell phone user receives in just one day.

### ■ **Is the RF exposure of smart meters regulated?**

#### **Yes.**

The FCC sets the standards for RF exposure and is responsible for approving the technology that smart meters use. All smart meter radio devices must be certified in compliance with the FCC's rules and guidelines before being installed. The manufacturer tests the devices to FCC specifications and then presents the test results to an independent certification laboratory or to the FCC directly. Only after the FCC reviews the detailed report and certifies the smart meter radio device can the manufacturer market and sell the devices. The same procedures are used for Wi-Fi network equipment in personal computers and wireless routers located nearly everywhere in our homes and offices.<sup>4</sup>

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<sup>4</sup> "A Discussion of Smart Meters and RF Exposure Issues: An EEI-AEIC-UTC White Paper," Edison Electric Institute; Association of Edison Illuminating Companies; and Utilities Telecom Council, February 2011.

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The **Edison Electric Institute (EEI)** is the association of U.S. shareholder-owned electric companies. Our members serve 95% of the ultimate customers in the shareholder-owned segment of the industry, and represent approximately 70% of the U.S. electric power industry. We also have as Affiliate members more than 80 International electric companies, and as Associate members more than 200 industry suppliers and related organizations.

Organized in 1933, EEI works closely with all of its members, representing their interests and advocating equitable policies in legislative and regulatory arenas.

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