

10 THINGS TO KNOW ABOUT

SMART GRID

Perhaps you have heard the term “Smart Grid” but didn’t know what it meant, or perhaps you didn’t think it had anything to do with you. But actually, if you use electricity, Smart Grid is related to your daily living, work and play. This fact sheet answers 10 frequently asked questions about Smart Grid.

1 WHAT IS SMART GRID?

The electricity you use likely comes from a power generation source miles away. It comes to you through a complex network of transmission lines, substations, power poles and transformers. The lines to your home or business may also run underground. This power network is referred to as an *electrical transmission grid*.

Smart Grid is an upgrade to modernize and automate the electrical power grid. In basic terms “Smart Grid” refers to using advanced control and equipment technologies and integrating digital processing and communications to the production, transmission, distribution and consumption parts of the electrical power grid.

For power utilities, Smart Grid modifications add continuous, real-time two-way communications and monitoring to the vast electrical grid network, to immediately adjust to anomalies and power demands and loads.

2 WHY IS SMART GRID NECESSARY—WHAT’S WRONG WITH THE EXISTING ELECTRICAL SYSTEM?

To serve consumers with electricity throughout the country, the U.S. has more than 500,000 miles of

transmission power lines, most of which have not been upgraded since its construction in the 1960s and 70s. To meet future consumer electrical demands, provide reliable and secure energy, avoid power outages, and accommodate renewable energy production, modernization of the power grid is needed.

(See Figure 1.)

3 IS SMART GRID A REALITY?

Not yet. Various Smart Grid demonstration projects are testing Smart Grid technologies, components and applications to see how well these different pieces of a Smart Grid work in various regions across the country. For example, the Pacific Northwest Smart Grid Demonstration Project, headed by Battelle Memorial Institute, includes 11 utilities across five states. That team will test key functions of the future Smart Grid, from generation to end-use. In Oregon, Portland General Electric will test the integration of renewable power resources such as wind and solar. In Montana, Northwestern Energy will demonstrate Smart Grid technology on both the utility and customer side of the meter.



Figure 1. To learn how the electrical grid works and about related occupations, visit the interactive Smart City iMap at <http://cleanenergyexcellence.org/occupations/>

Click on the green lights to see smart grid energy jobs.

Image courtesy of Idaho Power.



4 WHAT BENEFITS DOES SMART GRID OFFER CONSUMERS?

Home-based “Smart Sockets” and “Smart Meters” allow you to monitor electrical usage – especially important for large appliances during peak load periods. One benefit of monitoring of energy consumption is “Time of Use” (TOU) pricing. TOU encourages consumers to modify energy use by offering lower rates during times of lower energy demand (off Peak).

5 WHAT WILL SMART GRID COST?

How the country’s smart grid should be financed and who should pay the bill is still a question. One of the purposes of regional demonstration projects is to account for all costs associated with Smart Grid upgrades.

6 WILL SMART GRID REALLY SAVE ON MY ELECTRIC BILL?

Some energy experts believe that with the smart grid, consumers can

cut their energy consumption by up to 10 percent. However, without your involvement, Smart Grid will not save on your electric bill. The potential for savings is in using Smart Grid technology in your home to monitor energy usage and choose how and when to use appliances, lighting, heating and cooling, and make other choices such as the temperature settings of your furnace and electric water heater.

7 HOW CAN I MONITOR AND “CONTROL” MY ELECTRIC USE WITH SMART GRID?

Smart Grid utilities can provide information you need to take advantage of electricity grid conditions. Depending on your interest, utility, and type of home power meter, a Home Area Network consisting of Smart Outlets and an in-home display can let you monitor and control everyday energy use and cost. The system can take a wireless signal from your power meter, forward the data to other devices in the Home Area Network, and upload the energy consumption information over your internet connection to a remote computer, which then interprets the data and sends it back to your computer or in-home device as information you can use to make money saving energy use choices.



8 DO I HAVE TO HAVE HOME INTERNET AND BE A COMPUTER USER TO USE SMART GRID?

Without Internet and a computer you will not be able to monitor your energy use, receive energy trend information from the utility and automatically control your appliances – actions that can potentially save energy and money.

9 IS SMART GRID SAFE AND SECURE?

Research from several national and international organizations suggest that the radiation emitted from the wireless Smart Meters, when installed and properly maintained, result in much smaller levels of radio frequency (RF) exposure than many common household electronic devices, particularly cell phones and microwave ovens. At every stage of the Grid System, security controls are being incorporated, tested and reviewed to assure a fail-safe, secure, and private grid.

10 WHERE CAN I GO FOR ADDITIONAL INFORMATION?

For more information and to watch a video about Smart Grid visit cleanenergyexcellence.org



© 2012, Pacific Northwest Center of Excellence for Clean Energy, A Centralia College Partnership and Montana State University Extension. Produced by Montana State University Extension. Funded by Pacific Northwest Center of Excellence for Clean Energy, A Centralia College Partnership, and U. S. Department of Energy. This material is based upon work supported by the U.S. Department of Energy under Award Number(s) DE-OE-0000398.



This material was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.



The U.S. Department of Agriculture (USDA), Montana State University and the Montana State University Extension Service prohibit discrimination in all of their programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, and marital and family status. Issued in furtherance of cooperative extension work in agriculture and home economics, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Douglas L. Steele, Vice Provost and Director, Extension Service, Montana State University, Bozeman, MT 59717.