AN INTRODUCTION TO THE SMART GRID

Green Energy Ohio

Office of the Ohio Consumers' Counsel

Your Residential Utility Consumer Advocate

CONSUMERS' FACT SHEET

Utility companies are upgrading the electric power system with "smart grid" technologies. The goal of the smart grid is to provide you with more information about your electricity usage, enable opportunities to benefit from new technology, and reduce the overall cost of electricity service. The Office of the Ohio Consumers' Counsel, your residential utility consumer advocate, has developed this fact sheet to provide an overview of what the smart grid is and how the upgrades will affect you.

What is the smart grid?

The smart grid uses modern infrastructure, metering, and communications technologies to upgrade electric transmission and distribution systems. The smart grid is designed to take advantage of technological innovation.

What are the components of the smart grid?

The term "smart grid" is a broad term that includes many types of modern upgrades to the electric system. It can include, among other things:

1. **Smart meters,** also known as "advanced metering infrastructure," are digital meters that replace old analog meters. Unlike analog meters, many smart meters can be read remotely (that is, without a person visiting the home to physically look at the meter) and can provide electric usage information to the utility and the consumer on an hour-by-hour or even minute-by-minute basis.
2. **Distribution automation systems** are devices designed to increase the efficiency and reliability of electric distribution and delivery to your home. These advanced operations allow the utility to more easily identify the cause and location of outages and to restore service to consumers more quickly.
3. **Integrated Volt/VAr Control** technology can reduce the total electricity that consumers use in two ways. First, it can regulate the voltage along electric lines more efficiently so that all consumers use slightly less electricity. Think of voltage as analogous to water pressure in water line. Second, it can reduce the amount of "line losses." When electricity travels through transmission and distribution lines, some is lost along the way through friction. VAr control technology can reduce

Continued on next page

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SMART GRID

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the amount that is lost. That way, more of what is generated actually makes its way to consumers' homes.

4. **Distributed generation** is electricity that consumers generate on their own. For residential consumers, this most commonly means solar panels, but it can also include wind turbines, microgrids, and battery storage, among other things.

What are the possible benefits of the smart grid?

Reduced costs. Smart grid technologies can reduce utilities' operations and maintenance costs, including costs for meter reading, call centers, and outage management. The OCC advocates for these savings to be passed along to consumers to reduce the overall cost of electricity. Consumers can also lower their bills through dynamic pricing, demand response, energy efficiency, and by generating their own electricity.

Reliability. The smart grid is meant to enable electricity to be automatically rerouted during outages. Momentary outages may occur less frequently and outages related to powerful storms can be reduced because the smart grid has the ability to automatically restore minor outages. This could reduce the duration of outages, isolate the damaged areas, and notify utilities exactly where repairs need to be made.

Dynamic pricing. Dynamic pricing may help you make cost-effective decisions about when to use electricity. The actual cost of providing electricity can vary based on demand or how much electricity consumers are using at any given moment. There may be greater electricity usage during hot days in the summer, which would drive up the price. On a daily basis, usage goes down at night when most people are sleeping, so it could be less expensive to provide electricity during these hours. Under traditional pricing, however, consumers generally pay the same price for electricity throughout the day and throughout the year.

With smart meters, your utility can offer you different prices based on the time of day. For example, you could pay a lower price late at night when demand for electricity is lower. You can then decide, perhaps, to run your dishwasher or dryer only during these hours so that you can save money on your electric bill.

Similarly, your utility can offer you an incentive to reduce your usage during times of peak electricity usage. So-called "peak time rebates" are simply a credit on your bill if you reduce your electricity usage at specified times when the utility predicts that demand for electricity will be high. This can be for one-off events (like a particularly hot day in July) or for daily events (like 6-8 p.m. when most people are arriving home from work and increasing their electricity usage).

Net metering. Smart meters have the capability for net metering. Net metering is a program offered by utilities for consumers who install renewable energy systems, like rooftop solar panels or wind turbines, and generate their own electricity. Essentially, consumers who produce their own electricity sell it back to the utility. The utility will then typically credit the net-metering consumer for the electricity they generated with a credit on their bill.

Continued on next page

AN INTRODUCTION TO THE

SMART GRID

CONSUMERS' FACT SHEET

What are the possible drawbacks of the smart grid?

Cost. The smart grid is expensive: more than $1 billion has already been committed to the smart grid in Ohio, and that's for just two of Ohio's four major electric utilities. Consumers are typically required to pay the costs of smart grid upgrades through their utility bills.

Disconnection. With traditional meters, your utility must send someone to your home to disconnect your service. But if your home has a smart meter, the utility can simply press a button remotely to turn off your service. These "remote disconnections" can reduce the utilities' costs, but at the same time, there is concern that smart meters will lead to wider-scale disconnections. The OCC continues to advocate that consumers facing disconnection should be adequately notified that their service is about to be disconnected and given all opportunities to avoid disconnection.

Opt-out fees. Under the current rules, you are permitted to opt-out of receiving a smart meter. But utilities in Ohio have received approval from the Public Utilities Commission of Ohio to charge both one-time fees and recurring monthly fees to consumers who opt-out. Before you opt-out of receiving a smart meter, understand the fees your utility may charge. The OCC has advocated against excessive opt-out fees for smart meter consumers.

Consumer privacy and cyber-security threats. The smart grid enables collection and sharing of consumers' electric consumption and billing data between a third party communications company and the utility. Care will have to be exercised when developing smart grid systems to prevent a breach of consumer information. Security protocols are under development to prevent hacking or other attacks on the new systems.

As utilities in Ohio begin to install smart meters and make smart grid upgrades, the OCC will be vigilant in its review of each utility's smart grid proposal. To learn more about how Ohio utilities are upgrading the electric power system with smart grid technologies, see the fact sheet, "Ohio's Progress to the Smart Grid" at the OCC's website www.occ.ohio.gov.

The Office of the Ohio Consumers' Counsel (OCC), the residential utility consumer advocate, represents the interests of 4.5 million households in proceedings before state and federal regulators and in the courts.

The state agency also educates consumers about electric, natural gas, telephone and water issues.

For more information, please visit the OCC website at www.occ.ohio.gov.

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