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## SOLAR ENERGY FREQUENTLY ASKED QUESTIONS

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As your Touchstone Energy cooperative, we are your source for energy and information. Since interest in solar power generation is growing, we put together a series of fact sheets to help answer questions you might have. Contact us for more information about solar and assistance in making decisions about whether solar is a good option for you.

### HOW DO WE GENERATE ELECTRICITY FROM THE SUN?

Solar energy systems work when sunlight hits a solar photovoltaic module (solar panel or PV panel) and causes electric current to flow. The current produced from the PV panels is controlled and regulated by an inverter, which converts direct current (DC) to alternating current (AC), needed for use by household appliances. The electrical panel is where the power gets distributed throughout your house; any excess electricity may be sent from the panel back to the cooperative's power grid.

### HOW MUCH ELECTRICITY CAN I GENERATE?

That depends on several factors. 1) The size of your system. You can determine how much electricity you want to produce; then size your system accordingly. Note that you can start out small and add on. A system that will generate 100% of your energy needs is expensive, so most systems are sized to generate only a portion of your home's needs. 2) Your site. If you have a shade-free area from 9 a.m. to 3 p.m., you'll be able to collect more sun and produce more energy than if your site is shaded. 3) The more sunny days in our area, the more electricity you'll be able to generate. You can find online calculators to help answer this question in more detail, and installers can provide details about your situation, too.

### WHAT HAPPENS WITH A SOLAR PV SYSTEM AT NIGHT AND ON CLOUDY DAYS?

Battery-backed or grid-independent systems use on-site energy storage to store excess energy produced during the day for use at night or when the sun is not producing enough power. Choosing this option will add significant cost and maintenance to your system. Most people opt for grid-connected systems for reduced cost, maintenance, and high reliability. With this type of system, the cooperative continues to provide energy to you when you need it 24-7. Your PV system will produce energy, and even excess energy, on sunny days. Your system will not collect sunlight at night and on cloudy days. That means, you will continue to draw electricity from the cooperative during these times.

### WHAT HAPPENS WITH A SOLAR PV SYSTEM DURING POWER OUTAGES?

Most grid-connected PV systems shut down to prevent back-feeding electricity into de-energized power lines that may have fallen or that line crew members may be working on. It's important to have this shut-down feature to prevent injuries—and even death—to those working on the line.

### **WILL CENTRAL ELECTRIC BUY ANY EXCESS ENERGY I PRODUCE WITH A SOLAR PV SYSTEM?**

Grid connected PV systems are connected to the cooperative's power lines. That means electricity can flow both ways (to your home from the cooperative, and from your PV system back to the electrical grid). In most cases, a majority of the energy use will be consumed by the home and offset at the retail rate. However, on sunny afternoons when your energy use may be low, your system may produce excess energy that can flow back to the grid and may be purchased back by the cooperative. Central Electric will purchase energy generated by a PV system above what you use. This rate is determined by the most current avoided cost of wholesale purchased power, which can be found in the Small Purchased Power Rider rate in the Renewable Energy section at CEMCPower.com.

### **HOW MUCH DOES A SOLAR PV SYSTEM COST?**

The price of PV components varies depending on the size of the system (generating capacity), type and quality of the components purchased, and complexity of the system selected. The good news for consumers is that the cost of PV has declined dramatically, while the technology has improved, equally dramatically. Installation costs depend on the size and complexity of the system, but also on the home layout and construction. For example, a simple, south-facing roof allows for an easier install than a roof with hips and valleys. In addition, some homes require structural or wiring upgrades. An average 4 kW system may cost between \$10,000 and \$20,000, before credits and incentives. This is based on a typical installed cost of \$2.50 to \$5 per Watt of distributed generation capacity. To determine your costs, look for online calculators to help you estimate your pricing, and also get bids from reputable installers.

### **ARE THERE INCENTIVES AND TAX CREDITS FOR INSTALLING SOLAR PV SYSTEMS?**

Yes. There is a federal tax credit of thirty percent through 2019, then a slow phase out of the credit by the end of 2021. The cooperative also provides credits for excess electricity generation that is not consumed by the home. Be sure to consult with your financial and tax advisor.

### **HOW LONG IS THE PAYBACK PERIOD ON A SOLAR PV SYSTEM?**

The payback period can range from 10 years to more than 20 years, depending on the system cost and the amount of electricity produced.

### **HOW LONG DO SOLAR PV SYSTEMS LAST?**

Certified PV products and systems generally have a life expectancy of about 30 years. Manufacturers test PV panels for hail impact, high wind, and freeze-thaw cycles to represent real-life situations. Most manufacturers offer 20- to 25-year warranties for panels; extended warranties may be available at an extra cost. Other components like inverters may have a shorter life. Make sure your roof is in good shape or budget for replacement before purchase or during the life of the system.

### **HOW CAN I KNOW IF A SOLAR PV SYSTEM WILL WORK ON MY HOUSE?**

To begin, you can look at factors such as which direction your home faces, the condition of your roof, and obstructions such as trees and other buildings that may block the sun during the peak generation period of 9:00 a.m. to 3:00 p.m. A reputable solar contractor can provide a more detailed analysis on what to expect, and the cooperative can offer advice, too.

### **HOW DO I GET STARTED WITH SOLAR?**

Before choosing a solar system be sure that your home is as energy efficient as possible; you may want to get a home energy audit to help determine which improvements will be most beneficial. Investing in energy efficiency provides a faster return on your investment. By improving your home's energy efficiency first you will reduce your overall energy use and may reduce the size of PV system called - that saves more money. Also make sure your roof is in tip-top shape. If yours is older, you may need to repair or replace it before installing solar (and remember, a solar PV system may last up to 30 years, so be sure your roof will last, too). Research solar and solar contractors thoroughly before investing in a system; get at least three quotes before choosing a one. Be sure to work closely with the cooperative for advice and assistance on interconnecting with the grid. We can provide information and history of your energy usage that can help you size your system and evaluate savings and we have experience in working with other member-owners and solar contractors.