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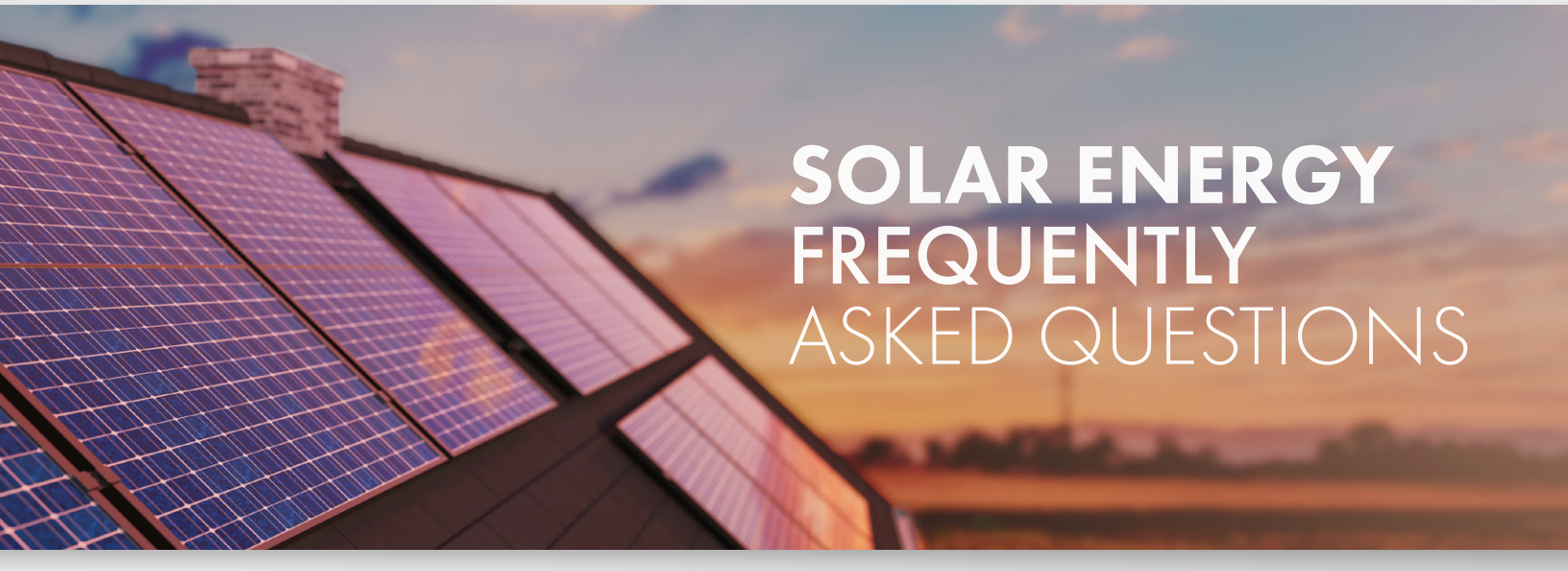

SOLAR ENERGY FREQUENTLY ASKED QUESTIONS

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 your 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) Your region. The more sunny days in your area, the more electricity you'll be able to generate. For example, systems in the Southwest produce more electricity per year than in the Northeast . 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, but the technology is improving and the costs are beginning to decrease.

Most people opt for grid-connected systems for reduced cost, maintenance, and high reliability. With this type of system, your 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 your 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. PV will not be producing energy in this case.

WILL MY TOUCHSTONE ENERGY COOPERATIVE 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 your cooperative, and from your PV system back to the electrical grid). Particularly on sunny days 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 your cooperative. Many cooperatives purchase energy generated by a PV system above what the homeowner uses. Check with your cooperative to get specific details for your area, including requirements for interconnection, safety, metering, and applicable rates.

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 continues to improve, allowing for more energy production from a smaller panel.

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 $2.49 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.

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

The payback period can range from fewer than 10 years to more than 20 years, depending on the system cost, available rebates and incentives, the amount of electricity produced, and the retail price of electricity you purchase from your cooperative. Check with your cooperative for more information.

HOW LONG DO SOLAR PV SYSTEMS LAST?

Certified PV products and systems generally are reliable, with 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. Little maintenance is required; occasionally it may be necessary to rinse modules off with water to remove dust and grime. Other components like inverters may have a shorter life. PV panels may outlast the roof they are attached to. Make sure your roof is in good shape or budget for replacement 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 generationperiod of 9:00 a.m. to 3:00 p.m. Solar contractors can provide a more detailed analysis on what to expect, and your cooperative can offer advice, too.

IF MY HOUSE IS NOT SITED FOR A SOLAR UNIT, ARE THERE OTHER SOLAR OPTIONS?

If your house is not ideal for solar, you rent your home, or you just aren't ready to make a big investment, there are other options. Talk to your cooperative about community solar or green power purchase option.

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 from your cooperative 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 required to meet your needs. 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 one. Be sure to work closely with your cooperative for advice and assistance on interconnecting with the grid. They can provide information and history of your energy usage that can help you size your system and evaluate savings. Co-op staff has experience in working with other member-owners and solar contractors .

This article was provided by Advanced Energy, a nonprofit energy consulting firm. For more information, visit ***www.advancedenergy.org.***

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