

## A Guide For Members Looking to go Solar

- 1. Determine how much electricity you use and what it costs, both annually and by the kilowatt-hour. Then find ways to make your home more efficient and reduce your energy use.**

Start by calculating your average electricity bill. Then conduct an energy audit of your home to identify ways of using energy more efficiently and reducing energy use. Implementing energy efficiency opportunities will almost always speed up the rate of return on your investment and additionally may enhance the viability of a solar system project by giving you the lower capital expense associated with a smaller system that will satisfy the new lower energy load. This could lower your electricity bill significantly. It does not make sense to spend a significant amount of money on a solar system that will produce electricity to power inefficient lights, appliances, electronics, and HVAC systems. Another on-line resource tool available to all Touchstone Energy Cooperative members is <http://www.touchstoneenergy.com/efficiency>

- 2. Determine your solar resource.**

The solar resource is the average amount of sunlight that reaches a given site. The greater the solar resource, the more electricity a solar system will generate. A qualified solar installer can provide information on your solar resource. Alternatively, you can evaluate it using an online tool, such as PVWATTS Version 1 from the National Renewable Energy Laboratory, available at <http://pvwatts.nrel.gov/> Several site conditions can influence solar performance—shade, roof condition, space required, orientation, and tilt. Shade is likely to have a greater impact on solar system performance than poor solar panel orientation and tilt. A qualified solar installer can use software tools to assess the degree of shading a proposed array will experience throughout the year and determine the best system design.

- 3. Determine your site's suitability.**

If your solar system is to be roof-mounted, the condition of the roof is important. The cost of repairs or a complete re-roofing will be substantially greater once the solar array is in place. Another consideration is the space available for an array sized to meet your needs. In bright sunlight, a square foot of a PV module will produce approximately 15 watts of electricity. That's a helpful rule of thumb for estimating how much area you will need. A 1,000 watt (1 kW) PV system, for example, is likely to need 70–120 square feet of area, depending on the type of module used. solar modules should be oriented geographically to maximize the amount of daily and seasonal solar energy. In general, the optimal orientation for a solar module in the northern hemisphere is true south. However, your modules can face up to 45° east or west of true south without significantly decreasing their performance.

- 4. Determine the size of the solar system.**

Realistically, the size of your system is likely to be determined more by cost than by desired output. It makes sense, however, to estimate the amount of electricity that you want your solar system to produce. If cost is a constraint, the system could be installed in two phases. Before determining the size of your solar system, it is advisable to adopt energy efficiency measures that will reduce your annual energy use and thus maximize the value of your solar system.

You can ask your solar installer to help determine the size of your system. You also can begin by calculating your electricity usage and the annual average peak solar hours at your site. A peak sun hour is the average amount of sunlight— summer and winter—available at your site. NREL publishes solar radiation resource maps that provide data on peak sun hours at <http://www.nrel.gov/gis/solar.html> Divide your annual electricity usage (in kWh) by the number of peak sun hours to determine the wattage needed for your system. (**\*\*NOTE\*\*** *Matching the solar system size to your annual usage does not mean that you will no longer have a monthly electric bill.*)

**5. Determine the estimated installed cost of the system and calculate return on investment.**

solar systems are rated in kilowatts of DC generating capacity (kWdc), and tend to range in size from less than 1 kW to 20 kW. The average cost of an installed residential solar system typically ranges from \$3/watt to \$5/watt, depending on the size of the system, the region of the country, and the size and maturity of the solar market in that region. An average 2 kW system is likely to cost between \$8,000 and \$16,000. As a rule of thumb, the larger the system, the lower the per watt cost. If you are considering the purchase of a battery bank, the cost will be higher. For a pole- or ground-mounted PV system, installation costs will be greater. In addition, a tracking device on a pole-mounted system will boost the cost of your solar system.

The payback for a solar system is the amount of time it takes for the system to pay for itself in energy savings. Depending on the level of government incentives, the payback period can range from approximately 12 years to more than 25 years, depending on the cost of the system, the amount of electricity produced, the retail price of electricity that you buy from your co-op, and your co-op's solar compensation program.

**6. Ask your cooperative about its solar buy-back policy and interconnection requirements, including costs and liability insurance.**

If you have not already talked with your cooperative about your plans, do so now. Discuss the steps you have taken to get to this point and provide information on the solar system you are considering. You need to make sure that the system meets the cooperative's criteria for interconnection. Your cooperative can provide information on its interconnection process and policies, as well as an application and interconnection agreement, and can answer any questions that you may have. ***\*\*Do not assume that your co-op will buy your solar system's excess power at retail rate. This can greatly affect the return on your investment and overall viability of the project.***

**7. Find a PV system installer (if you haven't already done so).**

Using a professional, licensed solar installer is the best way to avoid installation problems with your system. A qualified, experienced installer will design a system that meets your needs and site conditions. The installer also can help you with the paperwork for tax credits and rebates. You might want to start looking for an installer by asking current solar system owners in your area for references. Several Web sites also provide listings of qualified installers. Among them are the American Solar Energy Society, at <http://www.ases.org/>; Energy Matters' Solar-Estimate at <http://www.solarestimate.org/solar-companies#local-solar-companies>; and the North American Board of Certified Energy Practitioners (NABCEP), at <http://www.nabcep.org>. NABCEP is widely considered the most respected solar certification organization in the United States. It has a certification program for solar installers. To be certified as a solar installer under NABCEP, an individual must have several years of installation experience and training and also take an examination. (\*\*NOTE\*\* *Fannin Electric Cooperative does not affiliate with any solar installers.*)

**8. Signing the contract for installation of your solar system.**

Before actually placing an order, ask the installer for the names of consumers who have installed a similar PV system. Contact those consumers to ask about system performance, reliability, and support from the installer. Also ask if the system is meeting their expectations. Ensure that the solar panel manufacturer offers at least a 20-year limited warranty and the inverter manufacturer offers a five-year limited warranty. The panels and inverter must be Underwriters Laboratories (UL) listed. Also ask the installer about a warranty for the work.

**9. Check with your co-op to ensure that the installer has submitted all required paperwork and fees on your behalf.**

In addition to the paperwork you will sign for the install and financing of your solar system, there is paperwork and fees that are required to be submitted to your cooperative. Most often, the installer will fill in all of the details required, but you must sign the forms in order for the installer to submit them on your behalf. You will also need to determine with your installer, who will be responsible for paying the interconnection fees to your co-op.