Solar Energy FAQ

What is Solar Energy?

Scientists have known for many years that the sun emits enormous amounts of energy. Solar energy is contained in the sun's rays that strike the earth each day, and is the most abundant energy source on the planet. Enough sunlight hits the Earth's surface in 1 1/2 hours to power the entire world's electricity consumption for a year!

What are Photovoltaic Cells?

Photovoltaic cells are the most common method for capturing the sun's energy and converting it into electricity. They are made from materials such as silicon and convert photons from the sun's rays directly into electrons to produce an electric current.

What components are required to construct a solar system?

Photovoltaic systems are relatively simple. Photovoltaic cells are wired together to form a module, also known as a solar panel. Panels are linked together in a circuit to form an array, which is mounted on rooftops or in open spaces in a way that provides maximum exposure to the sun. The array is connected to an inverter and the wiring necessary to connect these devices to your home electric system.

Is New Hampshire a good place to install solar systems?

The amount of sun available to generate energy varies depending on latitude (sun angle), average cloud cover, and a clear exposure to the sun. New Hampshire averages about 4.1 hours of sun per day and ranks 18th among US states in solar potential.

How do I find out if my home is suitable for a solar installation?

The best way to determine if your home is suitable for a solar installation is to consult with a solar professional. They will assess your location to determine if your rooftop or ground mount location has the correct exposure to the sun's rays, and how much shading can be expected from surrounding trees.

How much solar energy do I need to generate?

The capacity of a solar system used to generate electricity is measured in kilowatts. One kilowatt equals 1,000 watts. Before moving forward with a solar energy system installation, you'll want to review your annual kilowatt-hour consumption. This review will help in determining how much electricity you need to produce, and will help you choose the solar system size that meets your budget and energy needs.

What happens to excess energy my solar system generates?

At certain times, particularly on sunny days when home energy use is low, a member-owned solar system may generate more energy than is used. Because member PV systems are connected to New Hampshire Electric Cooperative's power lines, electricity can flow both ways; to the member's home from New Hampshire Electric Cooperative, and from the members PV system back to the electrical grid. Excess energy sent back into the grid is credited on the members account through a process referred to as NET Metering. Specific details for regarding NET Metering, including requirements for interconnection, safety, metering, and applicable rates are available in the NHEC Terms and Conditions.

How much does a solar system cost?

The cost of photovoltaic panels has dropped considerably in recent years, but solar systems are still relatively expensive. Costs will vary depending on local site conditions and roof orientation. Average system costs typically run between $3.50 and $4.50 per watt installed. State or NHEC incentives along with federal tax credits may be available to help reduce your installation costs. Consult with a qualified solar contractor for detailed pricing based on your location.

How much maintenance does a solar system require?

In general solar systems require little maintenance, but systems should be monitored and routinely inspected to ensure your system is performing safely and to design standards. Panels may require occasional cleaning to remove accumulated debris.

How long will a solar system last?

Certified PV products are generally reliable with a life expectancy of 30 years. Most manufacturers' warranty panels for 20 to 25 years, and inverters for 10 to 12 years. PV systems could outlast the roof they are attached to; make sure roofing system is in good condition prior to installing a roof mount system.

What happens with a solar PV system at night and on cloudy days?

Your PV system will produce energy, and even excess energy, on sunny days. Your system will collect no sunlight at night and will collect reduced sunlight on cloudy days. That means, you will continue to draw electricity from New Hampshire Electric Cooperative during these times. It is possible to install a battery-backed system, which uses 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. If large enough batteries are installed, this may allow you to have electricity available to your home without being connected to NHEC's distribution system. However, this option will add significant cost and maintenance to your system and, therefore, most people opt to remain connected to the power grid to ensure high reliability and to reduce both the initial cost of the system and the cost of any ongoing maintenance.

What happens during power outages?

New Hampshire Electric Cooperative requires grid connected PV systems to automatically shut down during power outages to prevent back-feeding electricity into de-energized power lines that may have fallen or that line crew members may be working on. It is critical to have this shut-down feature to prevent injuries and even death to those working on the lines.

Should I purchase my solar system or lease?

These are similar to the options you face when deciding whether to buy or lease a new vehicle or a home. You'll need to do a similar analysis when considering having a solar energy system at your home. Here are some points to consider when exploring various methods of adding solar to your home.

PURCHASE

- It's a big investment, so you'll need to spend time researching, asking questions, obtaining multiple bids, and reviewing contracts.
- If you decide to own the system, you can pay cash or possibly obtain a loan. The system will be yours, and you'll receive the benefits of all power you generate from the system.
- Because you are the owner of the system, you'll have to pay up front for the components and all installation and costs of connecting the system to your home and to NHEC's distribution system. You'll most likely be responsible for maintenance and repair costs, and will bear liability for the system. While some installers offer service and maintenance contracts, not all do. You may be able to negotiate that in your contract; be sure to get details in writing before signing.
- As the system's owner, you may be able to take advantage of federal, state, and NHEC incentives – including a 30 percent federal tax credit. (Consult your financial / tax advisor).

LEASE (THIRD-PARTY OWNERSHIP)

Note that third-party ownership—or leasing—is not offered in all locations. If this is an option for you, consider these points.

- Leasing should reduce or eliminate your up-front costs to install a solar system. Some leases offer a no-money-down option, and some leasing programs are structured so that the projected savings in electricity purchases are applied to offset the lease payments.
- You'll notice that there is a wide range of solar lease programs available in the marketplace. Variables include the amount of money you'll have to pay up front, the length and term of the lease, and how responsibilities are divided between you and the leasing company. The differences between lease offers can be enormous, so be sure you understand all terms and conditions, and that you determine which options are most advantageous to your situation.
- With most solar leases, you'll enter into a long-term contract— usually 15 to20 years. Although the system is installed on your home's roof, you won't own the system, can't claim Renewable Energy Credits (RECs), and can't take advantage of any state or federal incentives. That's because those rights will belong to the leasing company and are factored into the deal they are offering you. You will, however, receive all power produced by the solar system, at the rate negotiated in your contract.

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 by participating in the New Hampshire Electric Cooperative's Home Performance with Energy Star program to help determine which improvements will be most beneficial. Investing in energy efficiency, can help provide 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 the PV system needed. Also make sure your roof is in tip-top shape. If yours is older, you may need to repair or replace it before installing a solar roof mounted system (remember, a solar PV system may last up to 30 years, so be sure your roof will last, too). (Most manufacturers' warranty panels for 20 to 25 years, and inverters for 10 to 12 years). Research solar energy and solar contractors thoroughly before investing in a system; get at least three quotes before choosing one. Be sure to work closely with New Hampshire Electric 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. Co-op staff have experience in working with other member-owners who've installed solar and solar contractors.