

Learning about Solar

Solar electric systems, photovoltaics (PV), convert sunlight into electrical energy through an array of solar panels that connect to a building's electrical system. PV is often a cost-effective way for homeowners and businesses to reduce their energy costs, while also reducing their environmental impact. To determine whether PV is right for your home or business, familiarize yourself with how the technology works.

Solar Panels

Solar panels need a south-facing, unshaded area to work optimally. This could be on your roof or in your yard.

Panels are made up of a series of individual solar cells that convert sunlight into direct current (DC) electricity. The more intense the sunlight is striking the panels, the more electricity they produce.

Solar panels make more power in the sunnier months! In the winter, you will find you are buying more power from Eversource because the days are shorter and we have less sun in general. In the summer and shoulder months, you will see that you are making a lot more power. Depending on how efficient you are with your power use, you may see your meter spinning backwards in the sunnier months.

The electricity produced by the solar array is then sent to an inverter.

The Inverter

The inverter converts the panels' direct current electricity into alternating current to be used in your building. Central inverters convert the electricity from solar arrays. Micro-inverters, attached to the back of each panel, can also make the conversion.

The power from the inverter is fed into your electrical panel. If the solar electric system is producing more electricity than needed, the excess is sent back out to the electrical grid and your electric meter will spin backwards. When your solar array can't provide enough electricity to meet your needs, the power is supplied from the electrical grid. (Eversource)

In grid-tied systems, inverters are designed so that if we have a power failure, the solar system shuts down as well. This is a safety precaution to protect people working on the electrical lines. Batteries can be added to give you power when the electrical grid is down. Battery technology is greatly improving as the electric vehicle market expands.

Net Metering

We have net metering in this State. Our electric meters can spin backwards and forwards, depending on whether electricity is being pulled from or sent to the utility grid. Over the course of a month, the meter measures how much electricity was consumed and generated on site to determine if you will receive a credit or a bill from the utility.

How Much Do I Need?

On the second page of your electrical bill, you will see how many kilowatt-hours (kWh) of electricity you have used in the previous 13 months. Add up 12 of those months to calculate your annual electrical usage. A kilowatt (1000 watts) of solar panels produces about 1250 kWh a year in our region. If you take your annual usage number and divide it by 1250, you will know how large a solar array you would need (in kilowatts) to provide 100% of your power.

What Does My Power Currently Cost Me?

Your electrical bill has 2 parts: the cost of power delivery and that of power supply. Eversource delivers your power, the Cape Light Compact (NextEra Energy Services) may be your power supplier. You pay \$7.00/month to be an Eversource customer and then you pay a series of pro-rated delivery charges. The "Generation Service Charge" is the power supply charge.

Our electricity is currently about 24.5 cents/kilowatt-hour.

When you are looking at buying a solar system, a good question to ask is: what will be the kilowatt-hour cost of my electricity over the life of this solar system?

How Much Does it Cost?

The cost of installing a solar electric system varies and is based on system size, location, equipment used and other site factors. We have a number of installers on the Vineyard and talking to them will give you the best idea as to price.

Some rules of thumb:

- Smaller arrays cost more than larger ones.
- Ground mounted arrays cost more than roof mounted ones.
- Higher-performance modules cost more than standard ones.
- Very large arrays have additional interconnection fees

This Solar Costs Comparison Tool (<https://www.masscec.com/solar-costs-performance>) gives you some historical data from our installers (enter in Dukes County in the box) but talking to different installers about how they would approach your site and needs is a good way to get started. Ask them how long they have been in business, what their warranty policy is and how they help with maintenance of systems.

Efficiency always offers the "best bang for the buck." Switching to more efficient lighting, appliances, heating and cooling equipment, insulating your house better are all cheaper than putting in more solar. Doing those things first will help you save money on the size of your solar array.

Rebates and Incentives

In addition to spinning your meter backwards (when you produce more power than you need), you can get both federal and state tax credits and, get credit for the power you make via the SMART program. Your installer can explain these to you. This link might also be helpful. <https://www.masscec.com/solar-incentives-and-programs>