

## Frequently Asked Questions About Solar

### How does solar power work?

The two most commonly used types of solar energy technology in Massachusetts are photovoltaic (PV) panels and solar thermal collectors. PV panels contain a semiconductor material (typically silicon-based) that converts sunlight into direct-current (DC) electricity. An on-site inverter converts the DC power to 120-volt AC power, which can then be connected to a home or building's power supply or directly to the electricity grid. Solar thermal collectors absorb the sun's thermal energy and use it to heat water or other fluids, which can be used for hot water or circulated through a home or building for space heating.

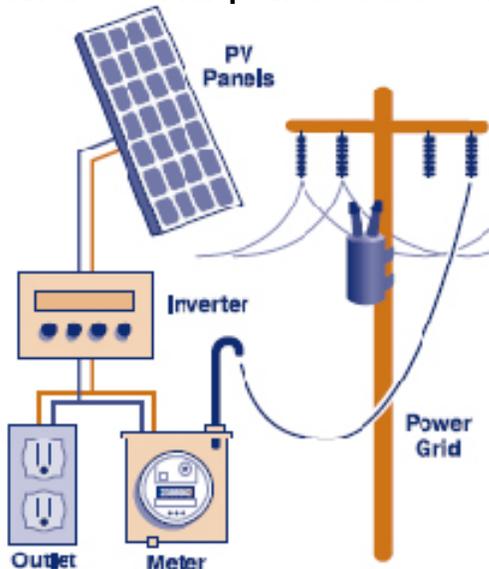
### Is my home a good candidate for solar?

The first question should always be whether your building is energy efficient. Energy efficiency upgrades should always precede or accompany solar investments.

Next, do a solar spot check on your own. Is your roof shaded by trees or other buildings? If your roof is sloped, is there a south-facing slope? If there is an uninterrupted southern exposure, your home or building may be ideal for solar PV and/or solar hot water. Even if you have some shading, solar hot water may still work well because solar thermal collectors absorb diffuse, rather than direct, solar radiation.

If your home passes the spot check, then take your investigation to the next level by visiting the National Renewable Energy Laboratory's *In My Backyard Solar Mapping Tool* at [www.nrel.gov/eis/imby](http://www.nrel.gov/eis/imby) to determine your home's potential system size and estimated production. Visit [www.dsireusa.org](http://www.dsireusa.org) for an up-to-date, detailed description of incentives available by state, and browse a list of solar installers in your area at [www.nabcep.org/installer-locator](http://www.nabcep.org/installer-locator) or [www.findsolar.com](http://www.findsolar.com).

### How does solar power connect to the electrical grid?



The solar energy generated by PV panels is converted from DC to AC power by an on-site inverter. In grid connected systems, the AC electric current can then be routed

directly into the home or business or routed to the electric grid via a two-way meter. In “net metered” systems, the meter runs forward when the home or business is using more power than is generated by the solar panels. It runs backwards when the solar panels are generating more power than is being consumed on-site. The system owner receives a credit from the utility for the value of the excess electricity sent to the grid. In other words, the solar system owner is charged only for the “net” electricity consumed.

### **How big a solar energy system do I need?**

The size of the solar system you need depends on several factors such as how much electricity or hot water or space heat you use, the size of your roof, and how much you're willing to invest. Also, do you want the system to supply your complete energy usage or to supplant a portion of your higher cost energy usage? You can contact a system designer/installer to determine what type of system would suit your needs.

### **Can I earn money from the power generated by a solar system on my home?**

Two policy mechanisms create income for solar system owners.

**1. Net metering** generates income in the form of a credit for the value of the electricity that a customer-sited solar system sends to the electric grid. The credit is applied to reduce and offset the customer's electricity bill.

**2. Solar Renewable Energy Credits (SRECs)** have different forms in different states, but most involve monetizing the value of the solar attribute of the electricity produced from a solar system. Massachusetts has adopted a Renewable Portfolio Standard that requires a portion of the state's electricity mix to come from renewable energy sources. Massachusetts has further required that a certain percentage of the overall renewable energy purchases must come from solar energy. This creates a value for solar power above and beyond the value of the kilowatts alone and it can be monetized in the form of a payment stream to solar system owners. The following link provides information on the Massachusetts SREC program. [MA SREC Review](#).

### **What are the economics of an average residential solar system?**

The economics of residential solar vary significantly depending on solar policies and incentives available and different market conditions. Module costs (hard costs) are typically only about half of the total installed costs. These have been dropping significantly since 2000 due to a global supply glut and technological improvements. Soft costs (system design and installation, financing costs) vary from market to market, depending on the maturity level of the local solar industry. Advanced Energy Solutions offers an [online tool to estimate the cost and financing for solar energy systems](#).

The Solar Energy Industries Association publishes quarterly reports on many aspects of the solar industry, including installed PV pricing in various states. [Get the report](#).

