

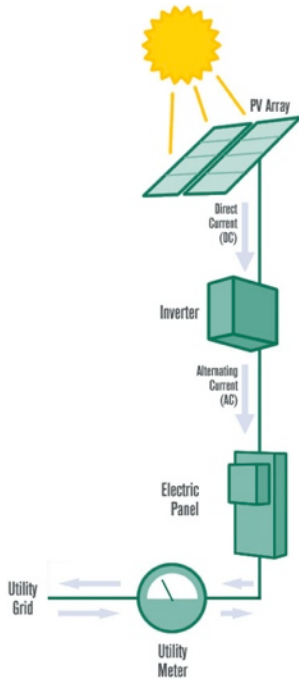


# Renewable Energy Vermont

## Solar Factsheet: *Electricity and hot water from the sun*

### What is Solar Power?

Solar power is the heat from the sun, and it is the foundation of all life on earth, allowing plants to grow and providing the warmth that makes our planet habitable. The sun is so powerful, and steady, that it beams more than enough energy to supply the planet's energy needs, every hour! Humans have organized their lives around the sun since the very beginning, designing systems to capture its energy for heating, cooking, and now, electrical and hot water needs.



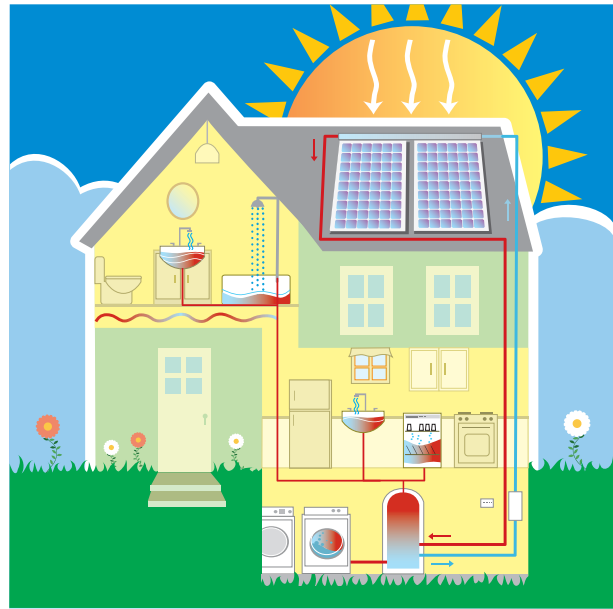
### How Do You Get Electricity From the Sun?

Modern solar photovoltaic, or PV, panels convert the sun's energy directly into electricity. PV panels are made out of thin wafers of silicon — the same basic building block of beach sand. As seen in the diagram to the **left**, Sunlight hitting the PV panels causes the electrons in the silicon wafers to move and bounce around rapidly, creating an electrical charge that is captured, converted to alternating current (AC) and used to power homes, businesses or whole communities.

### What Else Can Be Produced From the Sun?

The sun's energy can also be used to generate hot water for homes, or utility-scale electricity. Household solar thermal systems like the one on the **right** generally include a collector on the roof, a liquid medium, and a holding tank inside the building. The liquid medium circulates through the collector and is heated by the sun; then it flows into the holding tank, heating up water for sinks and showers. Utility-scale solar thermal systems concentrate the sun's heat on a liquid medium, which becomes so hot that it boils; the steam is used to turn a turbine, generating electricity.

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### Where is Solar Power Produced and Consumed?

Solar power can be produced, and consumed, anywhere in the world that the sun shines. Currently, the United States and the European Union are the biggest producers and consumers of solar PV and solar thermal heating. Solar PV usage grew 53 percent worldwide from 2008-9. By the end of 2009 there was approximately 20 Gigawatts (a typical non-CFL light bulb takes 60 watts to light up; a Gigawatt equals one *billion* watts!) of solar PV capacity installed around the planet, and 180 Gigawatts of solar thermal hot water producing capacity.



Green Mountain Power's Berlin, VT Solar Facility

### What Are the Benefits of Solar Power?

Compared to fossil fuel sources of electricity and hot water, solar energy is a zero-emissions solution, producing no climate-warming carbon dioxide, or polluting, harmful gasses. Solar power keeps power generation local, creating jobs and increasing our energy independence. Plus, once installed, solar power creates electricity and hot water for *free*!

### Did You

#### know?

If you take a look around the outside of your house or apartment building, you'll find an electric meter (like the one on the right here), which counts how much electricity your building uses. Buildings with solar PV installed often produce more electricity than they can use, and this extra power goes back into the power lines for other buildings to use. When this happens the electric meter actually runs backwards, giving the building owners a credit against their electric bill!



### Want to Find Out More About Solar Power?

We've got more information, links and resources at <http://www.vermont.org/main/technology/solar/>

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