

## *Everyday Environmental Stewardship*



### **Solar Energy** *Andrew Siliski*

**Key issue:**  
Electricity from renewable resources

**Stewardship Opportunity**  
Solar Energy

Solar power is clean, environmentally friendly, energy producing, and extremely cool. Solar panels can supplement or provide all of your home's electricity. Solar systems are very versatile and can be used in both rural and urban settings. All that is needed is sunlight and a roof or land facing south.

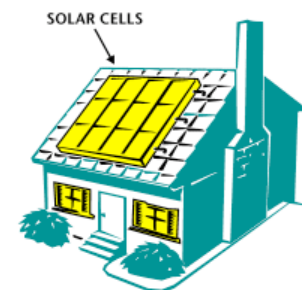
Solar power uses the sun's energy to produce electricity (DC) which goes through an inverter that converts the current to AC. Like wind power, this electricity is either fed into storage batteries solely for your use (off-grid system) or used by you with the "excess" sold to your electricity utility and sent onto the power grid (on-grid system). On-grid systems are less expensive than off-grid systems, but do not work during black outs.

### **Environmental Effects of Solar**

Of all electricity producing sources, solar energy has the smallest environmental impact. Solar panels do not take up land when installed on top of houses or places of worship so they conserve land. PV cells do not require massive strip mining for fuel (coal) or produce toxic byproducts (nuclear). The only negative environmental impact associated with PV cells is toxic chemicals (i.e. cadmium and arsenic) that are used during production. This can be controlled through proper production procedures and waste disposal methods. A 10 watt solar system will save approximately 246 tons of CO<sub>2</sub> from reaching the atmosphere. This is roughly equal to driving 490,000 miles in a car.

### **Size and Spacing for PV Cells**

The size of a solar system depends on how many kWh of electricity consumed per month. A typical home consumption rate of 1,000 kWh/month would prompt installation of a 10 watt system. An area of 1,000 ft<sup>2</sup> produces 1,000 watts of electricity. PV cells should also face south in an unshaded area from 9:00 am to 3:00 pm at a 35° angle in New England. This assures the maximum amount of light hitting the PV cells, thus producing the most amount of electricity.



## Getting A Solar Evaluation

Before calling a solar power company, make sure you have your average electricity use in watts for the past year or so. This will help the company estimate how much solar power will be needed to be installed on your house and thus give you a better estimate for the cost of the project. If you plan on running your electricity entirely on solar power, it is wise to reduce your consumption as much as possible. [Look at the MIP&L *EES* documents on *CFLs*, *Monitoring your Utility Cost and Use*, and *Home Energy Audits*. These will help you reduce utility use.]

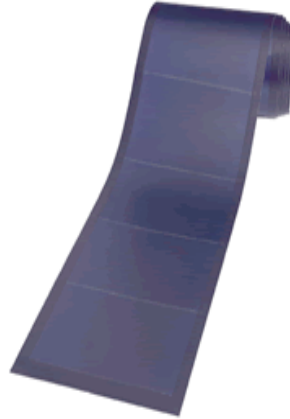
An on-site evaluation will determine whether the location is sensible for solar power, and if, so, where to put the solar panels, and the possible amount of electricity that can be generated.

## Different Kind of Solar Panels

There are three main types of solar panels:



*Rigid Panel*



*Laminate Panel*



*Shingles*

Laminate panels and shingles are flexible and can actually fit right onto a roof. Rigid solar panels are 5% more effective and can be mounted on any type of roof.

## Care and Maintenance

Like wind power, solar power requires very little maintenance. Usually rain naturally cleans the solar panels. However, living in a or close to a city may require monthly cleaning which includes rinsing with a hose to rid the accumulated dust and pollen. Two suggestions: (1) Never walk on or over the panels. (2) Never clean the panels with water when they are very hot.

## Tax Incentives

There are several tax incentives available through the state and federal governments. Go to the link below for Massachusetts and federal state tax incentives. These are the same tax incentives as for wind power.

<http://www.dsireusa.org/library/includes/map2.cfm?CurrentPageID=1&State=MA&RE=1&EE=1>

## **Massachusetts Technology Collaborative**



Application grants of up to \$50,000 for systems less than 10KW and \$250,000 (or up to 75%) for systems over 10KW!!!! If you are considering installing a solar system, you MUST visit this site. MTC gives out grants for residential, commercial, industrial, institutional, and public facilities. The photo is of a PV installation on MIP&L co-founder Steve MacAusland's house. 35% of the cost was from a MTC grant. Go to

[http://www.masstech.org/RenewableEnergy/small\\_renewables.htm](http://www.masstech.org/RenewableEnergy/small_renewables.htm)

## **Solar Estimator and Installer Locator**

Go to <http://www.findsolar.com/index.php?page=rightforme>. By inputting your location kWh usage, and what percent of your electricity use you want your system to produce you can estimate size, price, and savings for a solar system for your home or house of worship.

## **NABCEP Certified Solar PV and Solar Thermal Installers**

The North American Board of Certified Energy Practitioners certifies PV installers and recognizes those who have met certain qualifications. It protects the consumers by ensuring that the installers are qualified. Go to

<http://www.nabcep.org/map.cfm?state=ma>