

Considering a Home Photovoltaic System?



Concern over climate change, environmental issues and energy costs have some people considering alternative sources of energy. The installation of photovoltaic “solar panels” for home use is an option.

The systems fall into two categories. Stand-alone systems have no connection to conventional electrical supply lines and all electricity used is provided by the photovoltaic system. Some structures have a solar electric system in addition to a conventional power connection. An example is a home featuring conventional electrical service with photovoltaic lighting in the garage. Since the two systems are independent of each other, the solar system is a stand alone installation.

Grid connected systems use solar power when it is available or conventional electricity when photovoltaic power is not. These systems usually have switches to isolate the photovoltaic system from the outside electrical supply. One feature of systems like this is the ability to return power to the electrical supply grid when the photovoltaics generate more electricity than is needed in the home.

Solar collecting panels do take up space. A 2-kilowatt system requires about 200 square feet of photovoltaic panels with the proper orientation. If the roof is sturdy enough, mounting the panels there allows good sun exposure and does not clutter the yard. If none of the roof surfaces face the sun (south in North Carolina), alternative mounting options are available.

Traditional photovoltaic panels are rectangular, shiny and rigid. The collecting surface looks like glass and has layers of crystalline silicon. These are very stable and do not degrade over time. Crystal silicon panels convert between 10 and 14 percent of the light that strikes their surface into electric energy. Amorphous silicon panels can have a variety of shapes including roofing shingles. They are less efficient than crystalline panels and will degrade. These are less expensive to produce and can generate electricity under lower light conditions.

It is important to know how much electricity your home needs, but it is also important to know how the electricity is used. Solar electricity is generally a poor choice for heating, air conditioning and refrigeration applications. If your home requires significant electricity for these purposes, it may be time to look at alternative technologies and highly-efficient appliances before proceeding with the photovoltaic installation.

For the majority of new installations, it is advisable to contract with a qualified installer. North Carolina has quite a few of these firms. They can supply all of the necessary equipment and have the appropriate permits and licenses required by local building codes. Residential photovoltaic systems can cost upwards of \$10,000.

The current North Carolina tax credit is 35% of installations costing up to \$30,000. The maximum tax credit for any new residential photovoltaic system is \$10,500. Installations costing more than \$30,000 are allowed the \$10,500 maximum credit. This applies to systems installed by January 2011. A federal tax credit program allows 30 percent of the total installation costs of systems installed after Jan. 1, 2009. The federal tax credit does not have an upper limit on the total cost of the installed system. The N.C. Solar Center has good information regarding photovoltaic tax credits on its Web site: <http://www.ncsc.ncsu.edu/>.

References

North Carolina State University, N.C. Solar Center Web site:

<http://www.ncsc.ncsu.edu/>.)

Southface Web site:

http://www.southface.org/solar/solar-roadmap/residential/residential_pv_options.htm

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<http://photovoltaics.sustainablesources.com/>

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Web site:

http://apps1.eere.energy.gov/solar/cfm/faqs/third_level.cfm/name=photovoltaics/cat=Getting%20a%20system