

Going Solar

Are You Ready to Make the Change?

Many homeowners today are focused on being “green” – exploring innovative ways to use clean, renewable energy while saving on energy costs. Solar energy, derived from the sun’s radiation, is one of the world’s fastest growing energy sources, providing power for electricity, lighting and heating water. Considering North Carolina receives a relatively constant amount of sunshine throughout the year, solar power may be a feasible option for your needs. **But how can you be sure you are ready to use solar energy?**

Start Smart: The First Step toward Energy Efficiency

While the cost of solar technology is decreasing, solar power solutions are still fairly expensive for homeowners. Before you commit to installing solar in your home, it is important to research available options. However, the first step is to ensure that your home is as energy efficient as possible and to reduce your current demand for energy. You can do this through simple and affordable improvements, such as:

- * Replacing your most frequently used lights with energy-efficient lighting
- * Checking for and repairing leaky duct work
- * Adding insulation
- * Turning off unneeded appliances
- * Unplugging “sleeping” appliances & chargers, such as printers, battery chargers for laptops, video games and cell phones
- * Setting your computer to go into standby mode
- * Purchasing ENERGY STAR® appliances and electronics
- * Changing your water heater temperature setting by reducing the temperature little by little until you find it getting too cool
- * Resetting your thermostats and setting your fan to “auto” mode (setting the heat at 68°F and cooling at 76°F can significantly reduce your energy costs)



Reducing your electrical consumption is typically much less expensive than installing solar energy systems and may allow you to purchase a smaller solar system to meet your needs, or to receive even more value from a larger system.

Know Before You Go

There are two primary solar technologies:

Solar Thermal

- * Used for heating water and air.
- * A proven economical technology for hot water, swimming pool and space heating applications.
- * Passive solar home design requires no mechanical equipment and is best accomplished in new home design.
- * Solar hot water systems use a collector and storage tank; usually designed to meet 70 to 80% of the domestic hot water needs and use electric, natural gas, or propane heating fuel as a backup. Homeowners typically see paybacks in five to seven years.

Solar Electric

- * Uses photovoltaic (PV) technology to produce DC electricity. An inverter converts the DC power to AC electricity, which can be used in your home or sold back directly to the utility.
- * The systems require little to no maintenance.
- * Can produce power for more than 20 years.

Calculate Your Need

A good on-line calculator is PV Watts (www.nrel.gov/rredc/pvwatts/) used to determine the amount of power produced by a grid-connected solar PV system. Created by the National Renewable Energy Laboratory, this simple tool automatically accounts for the amount of solar energy available based upon location and typical weather patterns.

North Carolina's available solar energy is fairly consistent, averaging three- to-four full sun hours in the winter and five- to-six full sun hours in the summer.

You can use basic information about your site (such as exact direction of your panels) to estimate output for your system. In North Carolina, a typically installed kilowatt of solar PV panels provides 1,300- kWh/year.

Calculate Your Cost

A good measure to consider when buying PV panels is cost per watt:

- * Installed PV system without battery backup: \$6 or \$6,000/kW
- * Battery backup, if desired is estimated at an additional \$4,000/kW
- * The typical cost of a solar hot water system: \$6,500-7,500

Advanced Energy recently conducted a study of actual generation data for PV systems and found that on average, systems under-produced by 16 to 24% compared to the PV Watts model. This was mainly due to the fact that shading is usually not accounted for in the model.



To fully provide all of your energy needs, a PV system would require about a 10-kW system.

At a cost of \$6,000 to \$10,000 per kW, your investment would be about \$60,000 to \$100,000. Because of the high initial cost of producing all of your electricity, many PV systems are designed to offset only a percentage of your electricity needs.

Going Solar

There are federal and state tax credits and incentives for solar installation (visit www.dsireusa.org for current incentives), that can reduce your investment significantly, though not all homeowners will be able to take full advantage of the available tax credits. Contact a tax consultant to determine how these credits can be applied to you.

Solar Energy Resources

Database of State Incentives for
Renewables & Efficiency
www.dsireusa.org

NC GreenPower
www.ncgreenpower.org

NC Solar Center
www.ncsc.ncsu.edu

NREL Measurement and Instrumentation Data Center
www.nrel.gov/midc/

NREL Solar Radiation Research
www.nrel.gov/solar_radiation/

PV Watts
www.nrel.gov/rredc/pvwatts/

Renewable Resource Data Center (RReDC)
www.nrel.gov/rredc/

Renewable Energy Access
www.renewableenergyaccess.com

SMARTS
www.nrel.gov/rredc/smarts/

Solar Nation
www.solar-nation.org

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