



Solar Energy in Kentucky



Solar Energy Technologies

Solar energy is an important, yet under-utilized, natural resource in Kentucky. As energy prices increase and people become more aware of the true costs of using fossil fuels and nuclear energy, more and more people are turning to the sun to meet their energy needs.

There are a variety of technologies available for harvesting solar energy. The specific technology to choose depends upon what you need the energy for. For space heating, cooling, and lighting, **passive solar strategies** are very effective when incorporated into the design of homes and other buildings. Passive solar design, when combined with energy efficient construction, can dramatically reduce the need for supplemental heating, can eliminate the need for air conditioning, and can significantly reduce the need for electric lighting.

While passive solar design is easiest to include in new construction, renovations can often be made to solarize a building.

Solar thermal systems are used for water heating and space heating. These systems use solar collectors to harvest the sun's energy and transfer it to a storage medium, often a water tank. **Solar water heaters** used for heating swimming pools and domestic hot water are among the most common solar thermal applications. A solar water heater can reduce the cost of water heating by 50% to 80%, and can be installed in many existing homes, as well as new construction.

To meet your electricity needs, **solar photovoltaics (PV)** convert sunlight into electricity, which can be used directly as DC power, stored in a battery for later use, or converted to AC power for AC appliances.

It's important to choose the right solar technology for your specific needs. Solar electric PV systems are the choice for powering electric appliances and lighting, but are inappropriate for powering water heaters or electric resistance heaters. Converting solar electricity into heat is very inefficient and costly, when compared with a solar thermal system that uses the sun's heat directly for water or space heating.

For home heating, passive solar strategies are often your best first choice, if circumstances allow (i.e. if you're building a new home or if you can retrofit an existing house). If passive solar is not an option, a solar thermal system, using either hot water or hot air collectors, may be the best choice.

Conservation and Efficiency First!

Whether your motivations are environmental protection, financial savings, or energy independence, conservation and energy efficiency should be your first step before you go solar. Saving energy is much cheaper than producing it and produces greater environmental benefits for every dollar spent. Why install extra solar PV panels to produce energy that you're wasting in inefficient appliances?

The Kentucky Solar Partnership is a project of Appalachia—Science in the Public Interest.
Working for Healthy Land and Sustainable Communities in Kentucky and Central Appalachia.

www.kysolar.org

Solar Electric Options

Stand-alone PV systems provide electric power to homes that are **off-the-grid**. These systems include batteries to store excess power generated on sunny days for use at night and on cloudy days. Stand-alone systems require careful attention to your electricity demand and in most cases are used in homes that are very conserving and use very efficient appliances. Stand-alone systems can also be used in buildings that are on the grid, taking a portion of the electricity demand (such as a home office), off the grid.

Net-metered or **grid-intertied** PV systems are tied into the utility grid. The power generated by the PV system either flows to appliances being used in the home, or onto the electricity grid. When power is sent to the grid, it rolls the electric meter backwards, and at the end of the month the customer gets charged for the “net” energy consumed from the grid (the difference between total electricity consumed and PV electricity produced).

Net-metering is becoming increasingly popular, as it allows homes already connected to the power grid to still utilize solar electricity. Net-metering also allows you to meet only a portion of your electricity needs from the sun, if you cannot afford to meet 100% of your needs with PV.

INCENTIVES for SOLAR ENERGY

Federal Tax Credits for Solar Energy

Residential Tax Credits — For **solar electric (PV) systems** and **solar water heaters** placed in service after December 31, 2008, the tax credit is 30% of the equipment and installation cost, with no maximum tax credit. For systems placed in service *before December 31, 2008*, there is a \$2,000 cap on the tax credit. **Expiration date:** December 31, 2016.

Commercial Tax Credits — For solar water heaters, solar electric systems, and solar hybrid lighting, the tax credit is 30% of the equipment and installation cost, with no maximum limit. **Expiration date:** December 31, 2016.

Kentucky State Tax Credits for Solar & Energy Efficiency

For equipment installed after January 1, 2009 and before December 31, 2015, Kentucky offers individual and corporate tax credits for the following: solar PV, solar water heating, active solar space heating, passive solar buildings, and wind turbines. For PV, the credit is based on \$3/watt and for the other technologies, the credit is valued at 30% of the cost of the system. The maximum credit is \$500 for individuals or \$1,000 for commercial properties. Tax credits of varying amounts are also available for various energy efficiency improvements and Energy Star homes.

TVA Green Power Switch Generation Partners Program

TVA's **Generation Partners Program** pays a premium to customers generating renewable electricity onto the grid. Eligible resources include solar, wind, low impact hydro, and biomass. TVA will purchase all of the green energy output at a rate of 12 cents per kilowatt-hour for solar and 3 cents per kilowatt-hour for other renewable generation as a premium payment **above the retail rate and any fuel cost adjustments**. All new Generation Partners participants will receive a \$1,000 incentive to help offset start-up costs. Not all of TVA's distributors participate in the program. Contact your electric utility to find out if they are affiliated with TVA. If they are and you would like to be a Generation Partner, contact them and let them know. Distributors are more likely to participate if their customers show interest in the program. Contact: TVA Green Power Switch Generation Partners Program, 866-673-4340, www.tva.com/greenpowerswitch/partners/

Low-Interest Loans for Solar Energy Available in Eastern Kentucky

The Mountain Association for Community Economic Development (MACED) offers low-interest financing and technical support for the installation of solar water heating systems in Eastern Kentucky. MACED also offers loans to businesses for the installation of renewable energy systems and energy efficiency improvements, and to support the development of renewable energy businesses. Contact: MACED, (859)986-2373 or www.maced.org.

RESOURCES

The Kentucky Solar Partnership, 2235 Gregory Woods Rd., Frankfort, KY 40601. Tel: 888-576-6527

Email: solar@kysolar.org www.kysolar.org

The Kentucky Solar Energy Guide, available at www.kysolar.org

The Kentucky Sun Pages—A Directory of Renewable Energy and Green Building Businesses and Professionals Serving Kentucky, at www.kysolar.org.

Appalachia—Science in the Public Interest, 50 Lair St., Mt. Vernon, KY 40456. Tel:606-256-0077

www.a-spi.org

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