



Green Power



The term "green power" is used in a number of different ways. In the broadest sense, green power refers to environmentally preferable energy and energy technologies, both electric and thermal. This definition of green power includes many types of power, from solar photovoltaic systems to wind turbines to fuel cells for automobiles. This guide will introduce you to some of the different types of green power at work in your community.

BEST PRACTICE AREA: RENEWABLE ENERGY

DID YOU KNOW?

The University of Minnesota-Morris has taken steps to become a carbon-neutral college campus. Two wind turbines provide between 70-100% of campus electricity, a bio-mass facility offsets nearly 80% of the campus' fossil fuel usage, and 32 solar panels provide heat for the recreational swimming pool eliminating 32,000 lbs of CO₂ emission per year!

THE ADVANTAGES OF BIOFUELS, BY THE NUMBERS:

The University of Minnesota Extension service recently calculated the cost, per million Btu, of burning corn as a fuel compared to other sources:

Corn @\$2/bushel: \$7.85/million Btu
Fuel oil @\$1.50/gallon: \$13.39
Propane @\$1.00/gallon: \$13.59
Natural Gas @\$0.80/ccf: \$10.00
Electricity @\$0.08/kWh: \$23.44

CAN'T PRODUCE GREEN? BUY IT!

Many options are available to help reduce your carbon footprint through the purchase of Renewable Energy Credits (RECs). These credits are available to help in the construction and operation of green energy sources. RECs are different from carbon offsets although equally helpful to the planet. A REC purchase will go towards building a wind turbine or hydro-electric plant while a Carbon Offset will fund the planting of trees to offset pollution already being created. Both are great tools to go green if you cannot generate your own green power!

COMMON TYPES OF GREEN POWER:

Wind Power:

- Wind is a clean source of renewable energy that produces no air or water pollution. And since the wind is free, operational costs are nearly zero once a turbine is erected. Mass production and technology advances are making turbines cheaper, and many governments offer tax incentives to spur wind-energy development.
- Wind turbines can range in size from large commercial turbines 20-stories tall to small backyard turbines for residential areas.
- Some negative effects of wind turbines include noise and shadow flicker from turning blades, hazards to flying birds and bats, unappealing aesthetics and potential ice throw.

Solar Power:

- Solar energy can be obtained from two different methods: Photovoltaic (PV) devices or solar power plants. PV devices are individual solar panels that use the sun's rays to generate electricity for the owner. Solar power plants use the sun's rays to heat fluids to produce steam to power generators.
- Solar panels can be placed in an open field as an array to collect energy or can be incorporated into building design and placed on rooftops or building sides to be less intrusive to the surrounding environment.
- The capacity to harness solar energy is limited to the availability of the sun which varies depending on time of day, weather conditions, location, and time of year. In addition, since the sun moves across the sky, a wide area is needed to produce energy on a large scale.

Hydro-Electric:

- Hydro (water) power is one of the oldest forms of power. Water was first used to turn paddle wheels for the purposes of grinding grain and turning sawmill blades.
- Today most hydro-electric power generation takes place at river dams specifically designed to generate power. However, only a small percentage of dams were built for that purpose; most were built for flood control and irrigation. Water running through the dam turns large turbines that generate electricity.
- Hydro-electric power is limited by the constant accessibility of moving water and only locations along rivers will work to generate adequate power. In addition, hydro-electric facilities can negatively affect fish species and other wildlife that depend on the rivers.

Biomass:

- Biomass energy comes from the burning of renewable resources to create energy. Materials such as corn or wood are the most common types of biomass products used today and can be readily and quickly regenerated. The waste created from the normal use of corn or wood is burned at specially designed facilities that turn the heat generated into electricity or use it to heat liquid.
- Some biomass energy can be created by burning everyday household garbage.
- Small-scale biomass systems are available for personal use. Traditional fireplaces are the most common, but corn stoves are also becoming attractive features in many homes.
- In some parts of the world, there are entire communities whose entire hot water supply is created by burning waste wood products from nearby sawmills.

Geo-Thermal:

- Geothermal energy is generated by tapping into the naturally occurring heat below the Earth's surface. The heat is used to heat water resources which can then be used to generate electricity or to heat residential or commercial buildings and water.
- Geothermal energy may be used for individual uses in private homes or businesses or may be used by large-scale power plants to generate electricity.
- The power of geothermal energy can be viewed through geysers, hot springs and volcanoes.

