

## Options for Reducing Fossil Fuel Use

These are some of the more common technologies and practices that can be used to reduce fossil fuel consumption, but the list is not complete. See the sources below for more information about these and other options. **And of course, there are many more creative ways to save energy. Please share your ideas with us!**

### Key to abbreviations used below:

PV = photovoltaic  
 CO = carbon monoxide  
 PM = particulate matter  
 (CO, SO<sub>x</sub>, PM and NO<sub>x</sub> are all air pollutants regulated by the US EPA)

CO<sub>2</sub> = carbon dioxide, the major cause of global warming  
 SO<sub>x</sub>= sulfur oxides  
 NO<sub>x</sub>=nitrous oxides

Alternative Electricity Sources	Definition	Benefits	Limitations	Cost
Solar – photovoltaic (PV) systems	PV systems convert sunlight into electricity	<ul style="list-style-type: none"> <li>• Low cost operation</li> <li>• Can be integrated with a utility's electric grid, allowing you to sell the utility extra power and to supplement the electricity you produce</li> </ul>	<ul style="list-style-type: none"> <li>• Installation is currently expensive</li> <li>• Need unobstructed access to the sun to produce energy</li> <li>• Large surface areas are required to lay out panels of PV cells</li> </ul>	Generally pays for itself in 15 years
Hydroelectricity	Electricity obtained from the power generated by dams	<ul style="list-style-type: none"> <li>• No emissions</li> <li>• Renewable</li> <li>• Capable of generating large, and usually reliable amounts of power</li> </ul>	<ul style="list-style-type: none"> <li>• Dams cause disruption in aquatic and terrestrial ecosystems</li> <li>• Populations may need to be relocated to make room for dams</li> <li>• Drought can disrupt service</li> <li>• Small risk of disastrous flooding</li> <li>• Inefficient energy source</li> </ul>	Very expensive installation; less expensive to run, but more expensive than fossil fuels
Wind	Wind turbines convert wind into more useful forms of energy that can be used to produce electricity	<ul style="list-style-type: none"> <li>• No emissions</li> <li>• Abundant and renewable</li> <li>• Turbines can be set up without disturbing ecosystems</li> <li>• Existing technology is relatively high output and affordable</li> </ul>	<ul style="list-style-type: none"> <li>• Wind dependent (output proportional to wind speed)</li> <li>• Not feasible for all locations (coastlines and high ridges are best)</li> <li>• Some say turbines are unsightly and noisy</li> </ul>	In windy areas, cost competitive with fossil fuels
Nuclear	Controlled use of nuclear reactions to produce energy	<ul style="list-style-type: none"> <li>• Emits no air pollutants and very little radiation</li> <li>• Nuclear plants need to be refilled once a year vs. coal plants, which need trainloads of coal every day</li> <li>• More efficient than coal at turning energy into electricity</li> </ul>	<ul style="list-style-type: none"> <li>• Generates radioactive waste that last for thousands of years</li> <li>• Small risk of catastrophic disaster (especially for outdated plants)</li> <li>• Cooling water heats up rivers and reservoirs, causing potential harm to aquatic life</li> </ul>	More expensive to build than coal-fired plant; lower fuel costs but higher operations and maintenance costs than coal plant

<b>Alternative Transportation</b>	<b>Definition</b>	<b>Benefits</b>	<b>Limitations</b>	<b>Cost</b>
Walking, biking	Get off your butt and out the door!	<ul style="list-style-type: none"> <li>• Emissions free and renewable</li> <li>• Great exercise</li> <li>• Builds safe, friendly communities</li> </ul>	<ul style="list-style-type: none"> <li>• Chicago gets cold!</li> <li>• Long distances can be daunting</li> <li>• You can't carry a sofa on the back of bike (unless you attach a trailer, of course)</li> </ul>	Free! (Minus the cost of a bike)
Public Transportation	Buses, trains, subways, light rail	<ul style="list-style-type: none"> <li>• Saves gas and reduces emissions</li> <li>• Easily integrated with biking, walking, and car sharing</li> </ul>	<ul style="list-style-type: none"> <li>• Not always convenient for accessing certain locations or carrying groceries, equipment, etc.</li> <li>• Not financially sustainable in some low-density areas</li> </ul>	Cheaper than driving
Car pooling	Share the drive to work with a friend	<ul style="list-style-type: none"> <li>• Saves gas and reduces emissions</li> <li>• Cheaper and more sociable than driving alone</li> </ul>	<ul style="list-style-type: none"> <li>• Need a neighbor or two who works near where you do</li> </ul>	Cheaper than driving alone
Car sharing	Membership services (like I-GO) that provide access to communal cars	<ul style="list-style-type: none"> <li>• Freedom of owning a car without the hassle</li> <li>• Gas, insurance, cleaning, maintenance and reserved parking included</li> <li>• Good fit for people who don't drive every day or who need a second car occasionally</li> </ul>	<ul style="list-style-type: none"> <li>• Not well-suited for people who need to drive everyday</li> </ul>	Cheaper than owning a car if you don't drive everyday; generally a membership fee plus small per mile and per hour fees
Hybrid vehicles	Combine traditional combustion engine with battery and electric motor	<ul style="list-style-type: none"> <li>• Lower gas mileage and reduced emissions</li> <li>• High performance vehicles</li> <li>• Widely available</li> </ul>	<ul style="list-style-type: none"> <li>• Hybrid technology is sometimes used to add performance instead of to reduce gas use</li> </ul>	Cost competitive with traditional vehicles; can qualify for tax incentives
Biodiesel fuel	A replacement for diesel fuels that is made of natural, renewable sources such as vegetable oil or animal fat	<ul style="list-style-type: none"> <li>• Distributed using traditional diesel pumps</li> <li>• Used in conventional diesel engines</li> <li>• Reduces emissions of CO<sub>2</sub>, SO<sub>2</sub>, PM and CO</li> </ul>	<ul style="list-style-type: none"> <li>• Emits more NO<sub>x</sub> than traditional biodiesel</li> <li>• Limited availability</li> <li>• Can smell like French fries!</li> <li>• Some fossil fuels still required for production</li> </ul>	\$2.92-\$3.76/gallon in June 2006, depending on percent biodiesel
Ethanol fuel	Made from corns, grains, and other agricultural waste. E85 is a blend of 85% ethanol and 15% gasoline	<ul style="list-style-type: none"> <li>• Uses fuel equipment similar to traditional equipment</li> <li>• Reduces petroleum consumption and emissions of CO<sub>2</sub> and other air pollutants</li> <li>• Renewable</li> <li>• Produced domestically</li> </ul>	<ul style="list-style-type: none"> <li>• Growing and processing corn is fossil fuel- and water-intensive</li> <li>• Limited availability</li> </ul>	\$2.43/gallon in June 2006

<b>Alternative Consumption Habits</b>	<b>Definition</b>	<b>Benefits</b>	<b>Limitations</b>	<b>Cost</b>
Consume Wisely!	Buy locally produced products with minimal packaging	<ul style="list-style-type: none"> <li>• Reduces energy needed to produce and transport goods and packaging</li> <li>• Supports local economies</li> </ul>	<ul style="list-style-type: none"> <li>• Not available for all goods</li> </ul>	Comparable to traditional goods
Reduce, Reuse, Redesign, Rethink	Find easy (and creative!) ways to reduce the garbage you throw out	<ul style="list-style-type: none"> <li>• Reduces energy needed to produce and transport new good</li> <li>• Reduces energy needed to dispose of trash</li> </ul>	<ul style="list-style-type: none"> <li>• The sky's the limit!</li> </ul>	Reduces your costs!
Recycling	Reprocessing used materials to make new products.	<ul style="list-style-type: none"> <li>• Reduces the amount of energy needed to manufacture and transport goods, reducing emissions overall</li> </ul>	<ul style="list-style-type: none"> <li>• Reducing and reusing are even better!</li> <li>• Some items (e.g. certain types of plastics) cannot be recycled</li> </ul>	Generally free for individuals. Cost-effective for the cities that provide it, since recycled material can be sold.

<b>Alternative Heating/Cooling Methods</b>	<b>Definition</b>	<b>Benefits</b>	<b>Limitations</b>	<b>Cost</b>
Passive solar heating (can be used for cooling as well)	Design features such as large south-facing windows or building materials that absorb and slowly release heat	<ul style="list-style-type: none"> <li>• Reliable and mechanically simple</li> <li>• No emissions or fossil fuel use after construction</li> <li>• Reduces need for traditional heating system</li> </ul>	<ul style="list-style-type: none"> <li>• Usefulness depends on site</li> </ul>	Adds little or nothing to cost of construction
Geothermal heat pump	Pumps up air from below the earth's surface, where temperature is constant; can heat and cool buildings and supply hot water	<ul style="list-style-type: none"> <li>• Use 25-50% less electricity than traditional heating/cooling systems</li> <li>• Can be installed in new or retrofitted buildings</li> <li>• Last 20 years or more</li> <li>• Low operating costs</li> </ul>	<ul style="list-style-type: none"> <li>• Expensive to install</li> <li>• Not appropriate for all sites</li> </ul>	Generally pays for itself in 5-10 years
Insulation and Weatherization	Keeps the warm air in and the cold air out in the winter, and vice versa in the summer	<ul style="list-style-type: none"> <li>• An easy, do-it-yourself way to reduce heating and cooling costs, as well as emissions</li> <li>• Increases comfort by improving indoor temperature and keeping out noises</li> <li>• Can be added to almost any building</li> </ul>	<ul style="list-style-type: none"> <li>• Fiberglass and other older types of insulation (like asbestos) can cause respiratory problems. Consult a professional about removing these products.</li> </ul>	Pays for itself by reducing utility bills

Sources:

- "Sources of Energy." *CBC News Online*. May 20, 2004. <http://www.cbc.ca/news/background/energy/sources.html> (accessed October 13, 2006).
- U.S. Department of Energy Energy Efficiency and Renewable Energy website. <http://www.eere.energy.gov/> (accessed October 13, 2006).