

THE
Energy Solutions
for Life™ BROCHURE SERIES

Know what you can do.
Do what you can.

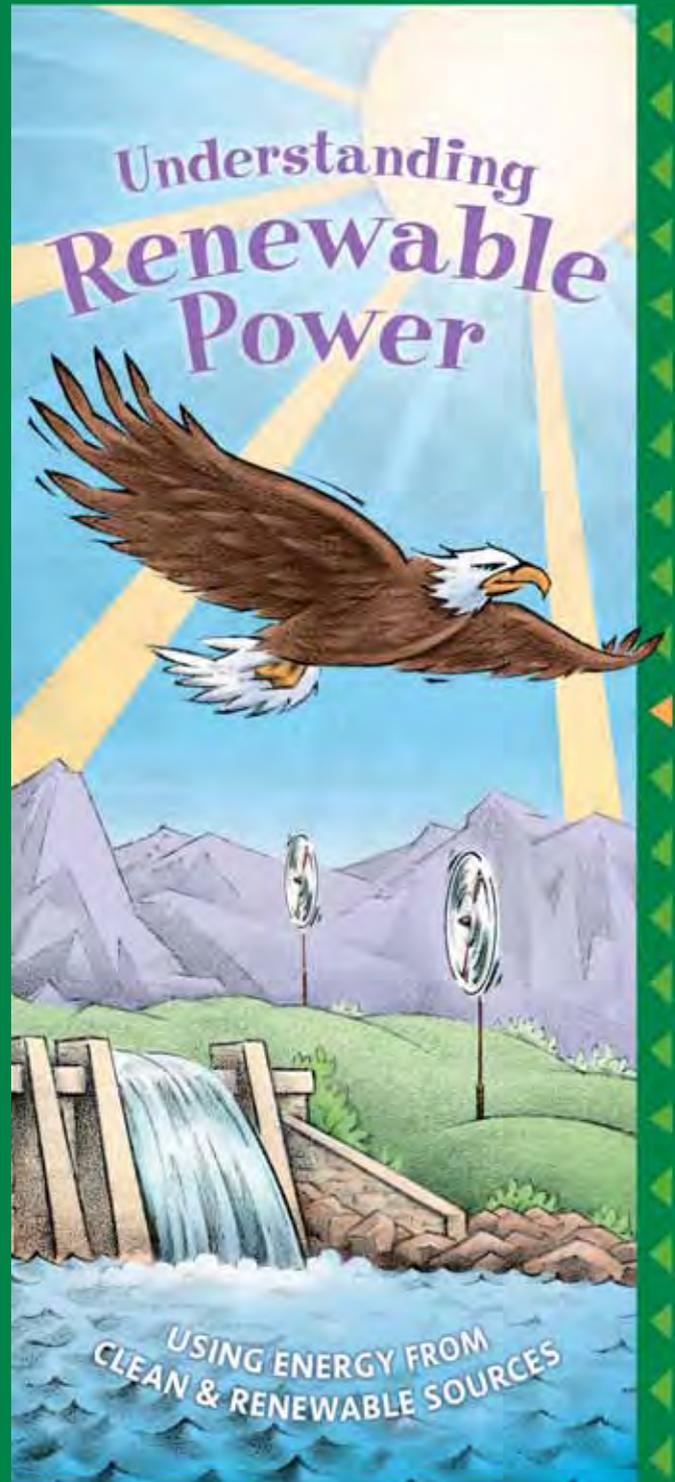
LOOK FOR THE ENTIRE ENERGY INFORMATION SERIES:



ASK ABOUT
ENERGY STAR

Remember to look for this label whenever you purchase new appliances and electronics. It symbolizes that the product is made to meet very high energy efficiency standards.

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Currently, the United States is overwhelmingly dependent on fossil fuels to generate electricity, power transportation, and heat and cool our buildings and homes.

Fossil fuels are limited. Scientists estimate oil will run out within 40 years and coal within 250 years.¹ In addition:

- Fossil fuels are inconsistently priced, wreaking havoc on our economy and wallets.
- Today oil accounts for 89% of net U.S. energy imports.¹
- For the sake of our country's health, environment, and security, we must invest in renewable energy today!

Why should we care about renewable sources of energy?

By definition, renewable sources are sources of fuel that **cannot** be depleted, thus they are continually available in the United States.

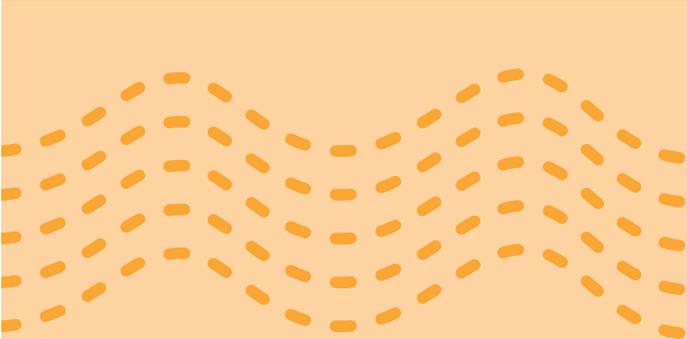
- Renewables, sometimes called **green power**, could provide us with a considerable amount of the power we need.
- Renewables burn cleaner than fossil fuels and therefore help to protect our environment.
- The **technology exists** today for us to take advantage of the benefits of renewable sources of energy.

It's already happening

Renewable sources provide 6% of the total energy consumed in the U.S. today.¹ Although renewables may never replace fossil fuels completely, they must be made part of the overall mix for meeting future energy needs. Here are some examples of what is being done around the country:

- The city of San Jose now runs its entire fleet of garbage trucks on **100% biodiesel**.
- Nationwide, more than 600 major truck/auto fleets now use biodiesel commercially. Approximately **600 retail filling stations** supply these fleets.²
- The University of Nevada uses **geothermal energy** to supply all the energy needs for its Redfield Campus in Reno.³
- The Five Star Dairy Farm in Wisconsin currently uses **digesters** to extract methane from dairy farm wastes and utilize this biomass to generate enough electricity to run about 600 households.⁴
- The Casino Reinvestment Authority has built an entire housing community of **solar-powered homes** in Atlantic City, New Jersey.⁵

Types of renewable energy available in the United States today are . . .



Wind

Using two or three propeller-like blades that are mounted on a rotor, wind turbines capture the wind's energy to generate electricity. The turbines sit high atop towers, taking advantage of the stronger and less turbulent wind gusts that occur at 100 feet (30 meters) or more aboveground.

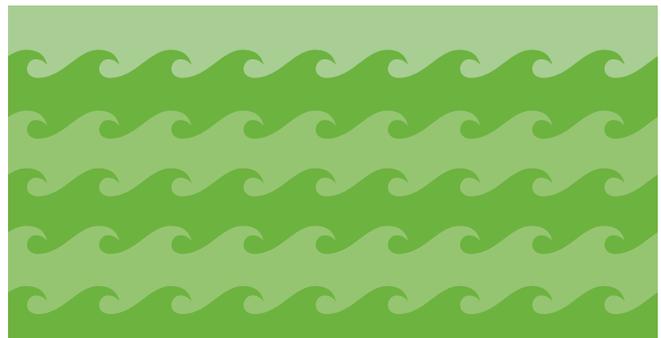
Although the availability of wind can vary, wind energy has no emissions and very few other environmental impacts.

Solar

Solar technology uses heat and light from the sun to generate electricity, provide heat, light, cooling, and hot water. Examples of this technology include:

- photovoltaic solar cells which convert solar energy to electricity
- passive solar heating and cooling for homes and businesses that require no mechanical devices
- “daylighting” systems engineered to redirect sunlight or skylight to areas where it is needed, without glare
- solar hot water heaters, space heaters, and space coolers

Although the availability of sunlight can vary, solar energy does not produce emissions nor does it have other environmental impacts.



Hydropower

Flowing water turns turbines in hydroelectric power plants to generate electricity. Dams on rivers or canals that simply control the river flow are the most commonly used methods for capturing the energy produced by moving water.

Although the use of dams and turbines in flowing rivers can cause injury to fish and have negative effects on downstream water supplies, hydropower technologies are rapidly reducing environmental impacts. In addition, hydropower does not produce any emissions.



More types of renewable energy . . .

Biomass

Organic matter, such as plants and animal waste, and municipal solid waste, such as that found in landfills, is burned or changed into gases to:

- generate electricity
- produce liquid, solid, or gaseous fuels
- produce heat
- produce chemicals

For example, biodiesel is a fuel made from vegetable oil that is currently being used in vehicles just like gasoline.

When, through biomass, methane is captured and used as a fuel instead of being released into the atmosphere, we eliminate a significant greenhouse gas (as it is over twenty times more harmful to the environment than carbon dioxide). Burning waste matter such as municipal solid waste not only prevents this waste from entering landfills but it cuts down on air pollution.

Hydrogen

Energy in hydrogen is used to generate electricity and produce heat primarily through the use of fuel cells. By way of a chemical reaction, fuel cells combine hydrogen and oxygen to produce electricity. Many scientists and economists believe our entire economy will be based on hydrogen power in the near future.

Although the safe transport and storage of hydrogen is an issue, technologies are rapidly improving ways to deal with it. In addition, hydrogen is the world's third most abundant element and emits only heat and water.

Geothermal

Geothermal heat pumps use the constant temperature of the water and soil just under the earth's surface to heat and cool buildings. Steam from underground reservoirs can be harnessed for electricity production. The direct heat from these hot water reservoirs is used to heat buildings and for commercial and industrial applications such as greenhouses.

Although the cost of drilling for geothermal energy can be high, once installed, it produces no emissions. In addition, heat pumps are readily available and thus, make it possible for consumers all over the U.S. to use this valuable resource.

What can you do?

If you think one person can't make a difference, just consider that 10 years ago many communities did not require **home waste recycling** but today, it is virtually a given! The energy choices we make every day will determine the future of renewables. Let's focus on three areas that directly affect your daily life: electricity supplier choices, transportation alternatives, and heating and cooling options for your home.

Electricity Generation

Fossil fuels are used to generate 71% of the electricity in the U.S.,⁴ however, **renewable energy sources** including water, geothermal, hydrogen, biomass, and wind are also being used. In fact, more than one third of U.S. consumers are now able to choose renewable energy sources to generate the electricity they use.⁵ This is typically called "**electric choice**," and describes when customers can purchase their electricity from sellers other than their traditional utility. To find out more about electric choice in your state, visit www.eere.energy.gov/states. The more people who support renewable energy sources being used to generate electricity:

- the more renewable power will be used to generate electricity
- the cleaner our overall air emissions will be
- the lower the risk to the security of our nation

If you're not able to choose renewable energy for your electricity needs today, here are some **simple steps** you can take to help reduce the use of fossil fuels . . .

- Use the **sun** to light your living and working spaces. Open the shades and curtains.
- **Don't waste**; remember to turn off lights and appliances when they're not in use.

- When buying new appliances, light fixtures, and light bulbs, look for **ENERGY STAR™-rated** products. Go to www.energystar.gov for more information and many more saving tips.
- Support local efforts to utilize **green power** in your community.

Transportation . . .

A **hybrid vehicle** uses a combination of two or more sources of power. The gasoline-electric hybrid car is just that—a cross between a gasoline-powered car and an electric car. **Gasoline-electric** hybrids have a gasoline engine as their main power source but also use an electric motor for additional power when needed (e.g. low-speed cruising or for extra power when accelerating or hill climbing.) What's more, hybrids can capture the energy normally lost during braking and store it as electricity in a special battery. Unlike all-electric vehicles, hybrids run on regular unleaded gasoline and never need to be "plugged in" to an electrical outlet.⁶

Wait . . . there's more:

A recent comparison proved a 2003 hybrid model outperformed a similar non-hybrid model by:

- Getting 25 more miles to the gallon
- Emitting 4.2 tons less greenhouse gases per year
- Saving more than \$796.00 in fuel costs per year (at \$2.39/gallon)⁶

You should know that auto manufacturers are **hot on the trail** of producing their best sellers as fuel-efficient hybrids. Currently, there are over 20 models of alternate fuel vehicles being manufactured by major companies, such as Ford, Honda, GM, Chrysler, and Toyota. For more information, go to www.fueleconomy.gov.

If you're not in the market for a new car, here are some other ways you can save transportation fuel . . .

- **Use public transportation** whenever possible.
- Walk or **ride a bike** to get to your destinations.
- **Combine errands**; get several tasks accomplished in one trip around town rather than making several short trips from home.
- **Carpool** to work. Many city areas have high occupancy vehicle (HOV) lanes to reward you for carpooling and quicken your trip!

Heating and Cooling your home and water

Renewable heating and cooling systems are currently being used in many homes across the U.S. For years, people have been burning wood in their homes as a source of heat. Unlike the inefficient stoves used in the 1970's, today's wood stoves use catalytic combustors! They can improve wood stove efficiency by 10 to 25%. Not only do these **catalytic combustors** reduce the amount of wood needed to burn, they also cut back on creosote formation and air pollution by as much as 80%.

Another free source of heat and light, used in homes for years, is **sunlight**. People use windows, doors, and skylights to take advantage of the sun's energy. You don't need any mechanical means to create passive solar heating, which can reduce heating bills as much as 50%.⁵ Passive solar designs can also include natural ventilation for cooling, thus requiring less or no air conditioning.

A relatively new technology on the home heating scene also has the benefit of cooling capabilities. A **geothermal heating system** uses the natural heat found below the earth's surface to heat homes. With a heat pump, not only can heat from underground be brought up to a home during the

winter months, but heat from the home can also be brought down underground during the warmer summer months. Visit www.nrel.gov to get more information about these home heating options.

If you're not ready to buy a new heating or cooling system, here are some simple ways you can **conserve energy** . . .

- A household's energy consumption for heating and cooling can be reduced by up to 25%, thanks to **carefully positioned trees** that block wind and sun, or let the sun shine in.⁵
- Install a **programmable thermostat** that automatically turns your heat down when no one is home or when you are asleep and turns it back up when you need it.
- Maintain your heating and cooling system by **keeping it tuned up** to get optimum efficiency.
- Be sure to **button up** your windows, doors and other wall penetrations so as not to allow heated or cooled air in your home to escape needlessly.
- Be sure heating or cooling ducts or baseboard **heaters are not blocked** by drapes or carpet.

Although renewables may never replace fossil fuels completely, they must be made part of the overall mix today in order to meet future energy needs.

¹ U.S. Department of Energy (DOE), Energy Information Administration

² National Biodiesel Board

³ <http://www.unr.edu/geothermal>

⁴ <http://www.environmentalpower.com>

⁵ U.S. DOE, Energy Efficiency and Renewable Energy

⁶ <http://www.fueleconomy.gov/feg/hybrid>