

# SPOTLIGHT ON ENERGY IN WYOMING

LET'S EXPLORE SOME COMMON WAYS WE GET OUR ENERGY IN WYOMING!

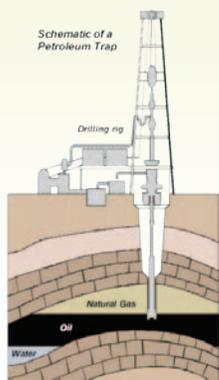
We use energy EVERY DAY, from the moment we wake up to the sound of an alarm, all the way through to the evening when we turn out the lights. Have you ever thought about how we get energy for heating our houses, driving our buses, and powering our T.V.'s?

**ABOUT 92%** of the energy consumed in the U.S. comes from non-renewable energy sources, which include uranium ore and fossil fuels – coal, natural gas, and petroleum.

**RENEWABLE ENERGY SOURCES** including biomass, hydropower, geothermal, wind, and solar. These provide 8% of the energy used in the U.S. Most renewable energy goes to producing electricity.

## OUR COUNTRY

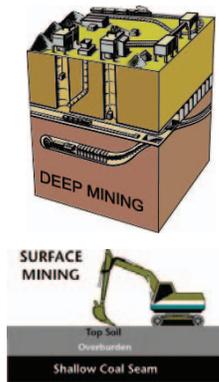
### WY'S NON-RENEWABLES:



**NATURAL GAS** and **PETROLEUM (OIL)** are both found underground. When both are burned, they produce heat. **COALBED METHANE (CBM)** is a form of natural gas extracted from coal beds. About 25% of energy used in the United States came from natural gas in 2010. In 2010, Wyoming ranked 2nd in the country for natural gas production. In 1884 the first oil well was drilled in Wyoming, southeast of Lander.

Natural Gas is used as energy to heat buildings, turn on lights, heat water, and keep homes and businesses cool. It is also the base ingredient for such varied products as plastic, fertilizer, anti-freeze, and fabrics.

Crude oil is used to make energy (gasoline, diesel) for cars and planes. It is also used to make ink, crayons, dishwashing liquid, deodorant, eyeglasses, tires, CDs and DVDs.

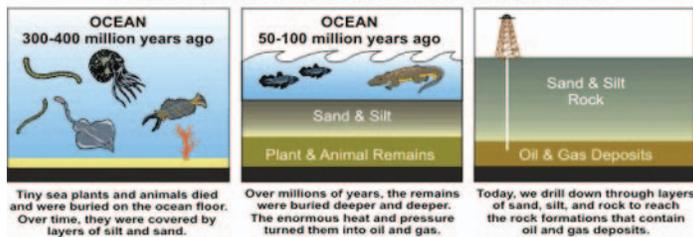


**COAL** is the most abundant fossil fuel produced in the U.S. Coal is a nonrenewable energy source because it takes millions of years to create. The energy in coal comes from the energy stored by plants that lived hundreds of millions of years ago, when the Earth was partly covered with swampy forests.

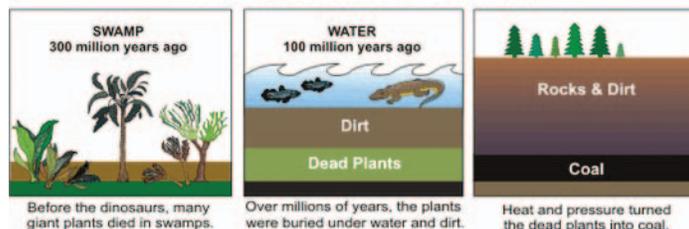
Wyoming is the largest regional coal producer, as well as the largest coal-producing state in the country. Eight of the top 10 producing coal mines in the U.S. are located in Wyoming. A pound of coal supplies enough electricity to power ten 100-watt light bulbs for about an hour.

About 93% of the coal used in the U.S. is used for generating electricity. Power plants burn coal to make steam. The steam turns turbines (machines for generating rotary mechanical power) that generate electricity. Separated ingredients of coal (such as methanol and ethylene) are used in making plastics, tar, synthetic fibers, fertilizers, and medicines. Coal is also used to make steel.

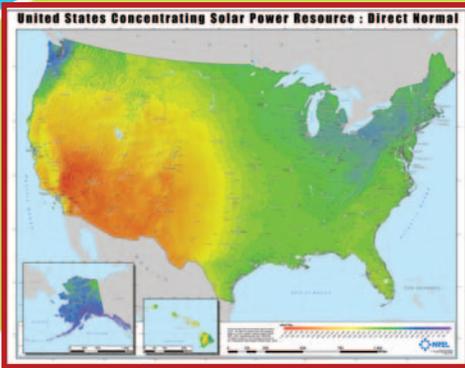
### PETROLEUM & NATURAL GAS FORMATION



### HOW COAL WAS FORMED



# WYOMING'S RENEWABLES

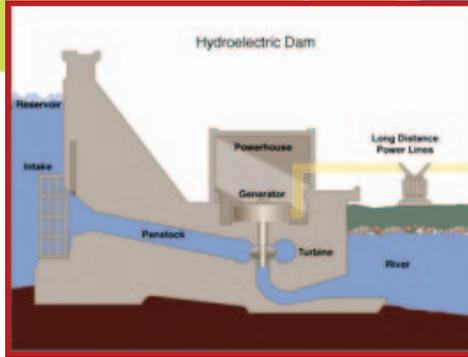


**SOLAR ENERGY** is the sun's rays (solar radiation) that reach the Earth. This energy can be converted into other forms of energy, such as heat and electricity.

Solar energy is by far the Earth's most available energy source. Solar power is capable of providing many times the total current energy demand. But it is an intermittent energy source, meaning that it is not available at all times. However, it can be supplemented by thermal energy storage or another energy source, such as natural gas or hydropower.

Concentrating solar power technologies use mirrors to reflect and concentrate sunlight onto receivers that collect the solar energy and convert it to heat. This thermal energy can then be used to produce electricity via a steam turbine or heat engine driving a generator.

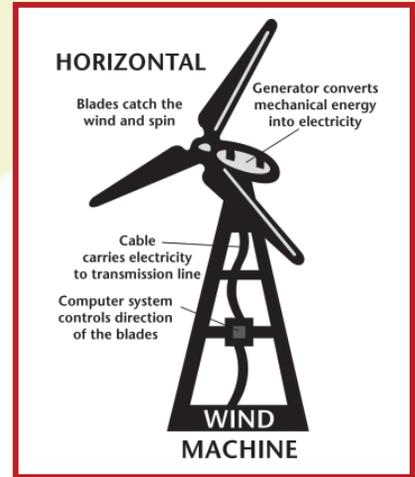
Another solar generating technology uses photovoltaic cells (PV) on panels to convert sunlight directly into electricity. Photovoltaics can provide tiny amounts of power for watches, large amounts for the electric grid, and everything in between. Many houses and buildings around Wyoming have PV systems on their roofs.



**HYDROPOWER** is one of the oldest sources of energy. It was used thousands of years ago to turn a paddle wheel for purposes such as grinding grain. Energy is created when water is used to spin turbines.

Hydropower is the renewable energy source that produces the most electricity in the U.S. It accounted for 6% of total electricity generation and 63% of generation from renewables in 2011.

Because the source of hydroelectric power is water, hydroelectric power plants must be located on a water source. The amount of available energy in moving water is determined by its flow or fall. Swiftly flowing water in a big river, like the Columbia River that forms the border between Oregon and Washington, carries a great deal of energy in its flow. Water descending rapidly from a very high point, like Niagara Falls in New York, also has lots of energy. The West has most of the largest dams, but there are numerous smaller facilities operating around the country. Two percent of the power used in Wyoming comes from hydropower.



Today, **WIND ENERGY** is mainly used to generate electricity. In 2011, wind turbines in the United States generated about 3% of total U.S. electricity generation. Although this is a small fraction of the country's total electricity production, it was equal to the annual electricity use of about 10 million households. Wyoming is among the top 10 states for total installed wind power capacity and many states are interested in buying our wind to provide electricity for their growing cities.

Like old fashioned windmills, today's wind machines (also called wind turbines) use blades to collect the wind's kinetic energy. The wind flows over the blades creating lift, like the effect on airplane wings, which causes them to turn. The blades are connected to a drive shaft that turns an electric generator to produce electricity.

## MORE ENERGY QUESTIONS TO FUEL YOUR BRAIN

What do the 3 'R's stand for? \_\_\_\_\_  
Do you know someone that works in energy? \_\_\_\_\_  
What do they do? \_\_\_\_\_

To learn more about energy in Wyoming visit [Rockies.Audubon.org](http://Rockies.Audubon.org)