

Power from Coal

History

Coal is a non-renewable resource, which means a finite amount of it exists and when we have used it all, it will be gone. Coal and other fossil fuels were formed millions of years ago during the Carboniferous Period. The main element contained in each of the fossil fuels formed during this period is Carbon. Coal starts out as dead plant and animal matter. This matter sank to the bottom of swamps and a spongy layer called peat was formed. Over time, clay, sand, minerals and rock piled on top of the peat, compressing it into the hard black substance we know as coal.

Coal has been used for centuries. Archeologists have found evidence that the Romans in England used it in the second and third centuries (100-200 AD). During the 1300s in North America, the Hopi peoples, in what is now the U.S. Southwest, used coal for cooking, heating and to bake the pottery they made from clay. Coal was later rediscovered in the United States by explorers in 1673. However, commercial coal mines did not start operation until the 1740s in Virginia.

Also in the 1700s, the English found that coal could produce a fuel that burned cleaner and hotter than wood charcoal. However, it was the overwhelming need for energy to run the new technologies invented during the Industrial Revolution that provided the real opportunity for coal to fill its first role as a dominant worldwide supplier of energy. The Industrial Revolution played a major role in expanding the use of coal. Steamships and steam-powered railroads were becoming the chief forms of transportation, and they used coal to fuel their boilers. In the second half of the 1800s, more uses for coal were found. During the Civil War, weapons factories were beginning to use coal. By 1875, coke (which is made from coal) replaced charcoal as the primary fuel for iron blast furnaces to make steel.

The burning of coal to generate electricity is a relative newcomer in the long history of this fossil fuel. It was in the 1880s when coal was first used to generate electricity for homes and factories. Long after homes were being lighted by electricity produced by coal, many of them continued to have furnaces for heating and some had stoves for cooking that were fueled by coal.

There are three types of coal: bituminous, anthracite and lignite. Each type has a varying degree of hardness, with anthracite being the hardest and lignite the softest. Due to the way it was formed, coal is located deep underground. It can be harvested by different kinds of mining, including deep mining and surface mining.

Pros and Cons

Pros

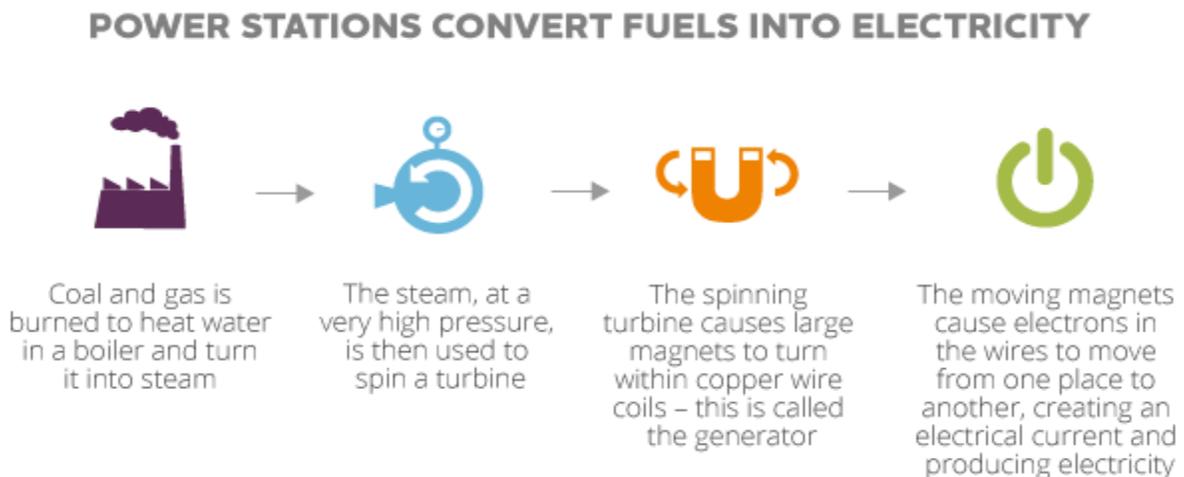
- ❖ Coal is plentiful in many places and it is easy to access through mining, so people rely on it to produce energy.
- ❖ Coal is easy to store. Once it is mined it can be safely stored with no hazard of fire or explosion like there is with gas or oil.
- ❖ It is relatively easy and inexpensive to convert coal into energy.

Cons:

- ❖ Coal is plentiful and easy to access. The process of mining it and converting it to energy has been perfected over many years. However, there are cons to using coal as a source of energy.
- ❖ Coal is a non-renewable resource – we will eventually use it all, so we cannot rely on it for a long term energy source, especially at the rate we are currently consuming it.
- ❖ When coal is burned it pollutes the air. Greenhouse gasses produced cause global warming and toxins released by burning coal can harm people and the environment.
- ❖ Mining itself disrupts the environment. Strip mining, or surface mining can change the entire landscape, and effect water supplies, people animals and plants living in the area.
- ❖ Mining is dangerous. Many miners are killed every year in accidents due to unsafe conditions.

How It Becomes Usable Energy

Electricity is one of the building blocks of modern life. We use it to produce light, heat and to run appliances and machines. Access to electricity can make a big difference for people. Most of the electricity produced in the world today comes from coal. In fact, 41% (almost half!) of the world's electricity is fueled by coal fired power plants. But how do these plants take a simple black rock and make it into electricity? First, the coal is mined from underground and ground into a fine powder so that it burns more easily. Take a look at the rest of the process below in the diagram from Energy Explorer.



Now that you have an idea about the process coal goes through to become electricity, watch this [VIDEO](#) to see an animation of how a coal fired plant works.

Cool Facts

- ❖ Coal was first discovered and used in China. The Chinese thought coal was a stone that could burn.
- ❖ Many cultures warn children that if they are naughty all they will get in their stocking at Christmas is a lump of coal.
- ❖ There are only enough coal deposits left to satisfy the current world energy needs for 300 more years.

Activities

Coal formation

Where does Coal come from?