

## Carbon: The Basics

Carbon, the basic building block of life on Earth, has recently become a celebrity of sorts. While most students receive a formal introduction to carbon in science class, those of us who missed out on (or have forgotten) the lessons can find a quick summary in the following few sentences:

Car · bon (noun): A naturally abundant, non-metallic element that occurs in all organic compounds and can be found in all known forms of life. Diamonds and graphite are pure forms.

Concentrated carbon also makes up the fossil fuels we use to produce approximately 70 percent of our nation's electricity (primarily coal and natural gas). When those products are burned, carbon combines with oxygen and gets released into the atmosphere as carbon dioxide.

For better or worse, carbon dioxide molecules can last for a century or more in the atmosphere, where they soak up heat. Prior to the Industrial Revolution, the atmosphere contained 280 parts per million.

Atmospheric levels of carbon dioxide are currently at 390 parts per million and climbing, with some projections estimating 450 parts per million by 2040. As result, carbon dioxide is considered a "greenhouse gas" blamed for contributing to climate change.

In the United States, power plants that burn fossil fuels produce about 2.4 billion tons of carbon dioxide every year, which is about 39 percent of the nation's man-made output (the largest single source). Since one pound of the gas would fill a beach ball a few feet across, imagine almost 5 trillion beach balls being made every year—enough to fill more than 600,000 football stadiums!

There are several ways to reduce the amount carbon dioxide in the air, some of which take place naturally. Forests, for example, act as a sponge for 15 percent of all carbon emissions in North America. Researchers are even working to develop "synthetic trees" that use absorbent filters to capture carbon dioxide from free-flowing air and prepare it for commercial use or permanent storage deep underground.

Another process is called "carbon capture and sequestration," through which carbon dioxide can be isolated, or captured, in an advanced coal power plant and stored underground. When the technology becomes available on a commercial scale, the result could be huge reductions in the amount of carbon dioxide that is released into the atmosphere.

Technology holds the key to tackling challenges connected to climate change. Access Energy Cooperative will play an active role in this effort.

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Sources: American Heritage Science Dictionary, U.S. Energy Information Administration, National Rural Electric Cooperative Association

Image Source: National rural Electric Cooperative Association