



# Natural Gas

## What Is Natural Gas?

**Natural gas** is a **fossil fuel** like petroleum and coal. Natural gas is called a fossil fuel because it was formed from the remains of ancient sea plants and animals. When the plants and tiny sea animals died hundreds of millions of years ago, they sank to the bottom of the oceans where they were buried by sediment and sand. This eventually turned into **sedimentary** rock. The layers of plant and animal matter and sedimentary rock continued to build until the pressure and heat from the Earth turned the remains into petroleum and natural gas.

Natural gas is trapped in underground rocks much like a sponge traps water in pockets. Natural gas is really a mixture of gases. The main ingredient is **methane**. Methane has no color, odor, or taste. As a safety measure, natural gas companies add an odorant, **mercaptan**, to the gas so that leaking gas can be detected (it smells like rotten eggs). People use natural gas mostly for heating. Natural gas should not be confused with gasoline, which is made from petroleum.

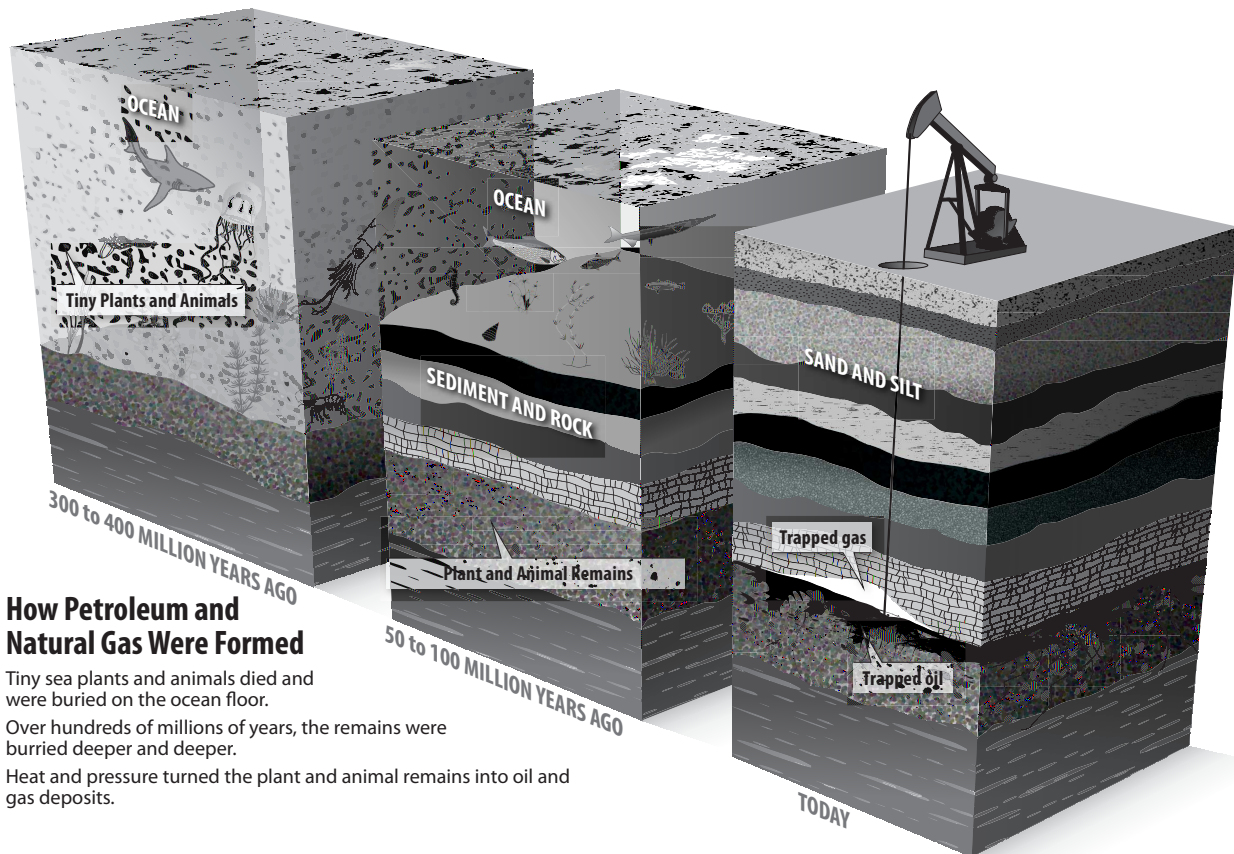
Natural gas is almost always considered **nonrenewable**, which means we cannot make more in a short time. However, there are some renewable sources of methane, such as landfills.

## History of Natural Gas

The ancient people of Greece, Persia, and India discovered natural gas many centuries ago. The people were mystified by the burning springs created when natural gas seeped from cracks in the ground and was ignited by lightning. They sometimes built temples around these eternal flames and worshipped the fire.

About 2,500 years ago, the Chinese recognized that natural gas could be put to work. The Chinese piped the gas from shallow wells and burned it under large pans to evaporate sea water to make salt.

In 1816, natural gas was first used in America to fuel street lamps in Baltimore, Maryland. Soon after, in 1821, William Hart dug the United States' first successful natural gas well in Fredonia, New York. It was just 27 feet deep, quite shallow compared to today's wells. Today, natural gas is the country's second largest supplier of energy, after petroleum.



### How Petroleum and Natural Gas Were Formed

Tiny sea plants and animals died and were buried on the ocean floor.

Over hundreds of millions of years, the remains were buried deeper and deeper.

Heat and pressure turned the plant and animal remains into oil and gas deposits.

Note: not to scale

## Producing Natural Gas

Natural gas can be hard to find since it is trapped in **porous** rocks deep underground. Scientists use many methods to find natural gas deposits. They may look at surface rocks to find clues about underground formations. They may set off small explosions or drop heavy weights on the surface to record the sound waves as they bounce back from the rock layers underground.

Natural gas can be found in pockets by itself or in petroleum deposits. Natural gas wells average more than 8,600 feet (2.5 km) deep!

After natural gas comes out of the ground, it is sent to a plant where it is cleaned of impurities and separated into its various parts. Natural gas is mostly methane, but it also contains small amounts of other gases such as propane and butane.

Today natural gas is produced in 32 states, though just five states produce 70 percent of our supply. Natural gas is also produced **offshore**. About six percent of natural gas production came from offshore wells in 2013. Scientists estimate that we have enough natural gas to last almost 85 years at current prices and rate of consumption.

Natural gas can also come from other sources, such as the methane gas found in coal. **Coal bed methane** was once considered just a safety hazard to miners, but now it is a valuable source of energy. Another source of natural gas is the gas produced in landfills. Landfill gas, a **biogas**, is considered a renewable source of natural gas since it comes from something continually produced—trash.

## Shipping Natural Gas

Natural gas is usually shipped by **pipeline**. About two million miles of pipelines connect gas fields to cities, to homes, and to businesses. Natural gas is sometimes transported thousands of miles in these pipelines to its final destination. It takes about five days to move natural gas from Texas to New York.

Eventually, the gas reaches the city gate of a local gas utility. Smaller pipes carry the gas the last few miles to homes and businesses. A gas meter measures the volume of gas a consumer uses.

## Who Uses Natural Gas?

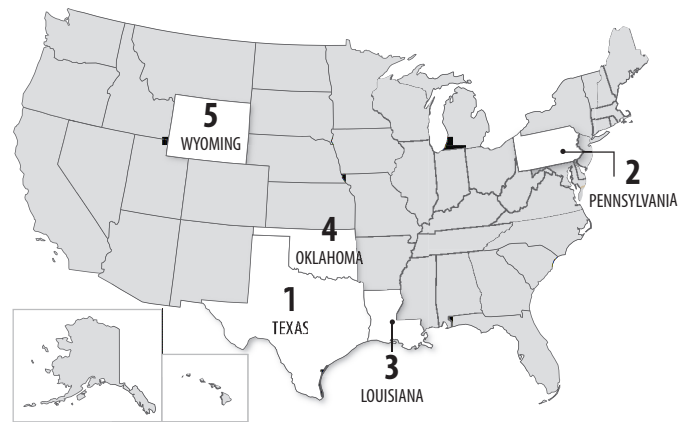
Just about everyone in the United States uses natural gas. Natural gas is used for nearly 27 percent of U.S. energy. Industry burns natural gas for heat to manufacture goods. Natural gas is also used as an ingredient in fertilizer, glue, paint, laundry detergent, and many other items.

Residences, or homes, use natural gas for heating. Like residences, commercial buildings use natural gas mostly for heating. Commercial users include stores, offices, schools, churches, and hospitals.

Natural gas can also be used to generate electricity. It accounts for over 27 percent of U.S. electricity generated. Many new power plants are using natural gas as fuel because it is cleaner burning and can produce electricity quickly when it is needed for periods of high demand.

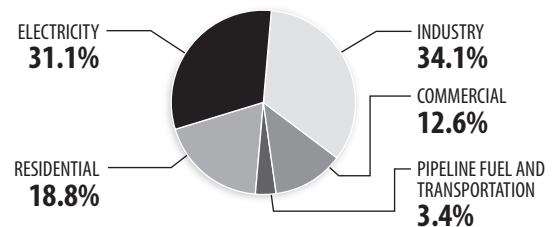
A small amount of natural gas is also used as fuel for automobiles. Natural gas is cleaner burning than gasoline, but to use it, vehicles must have special equipment.

## Top Natural Gas Producing States, 2013



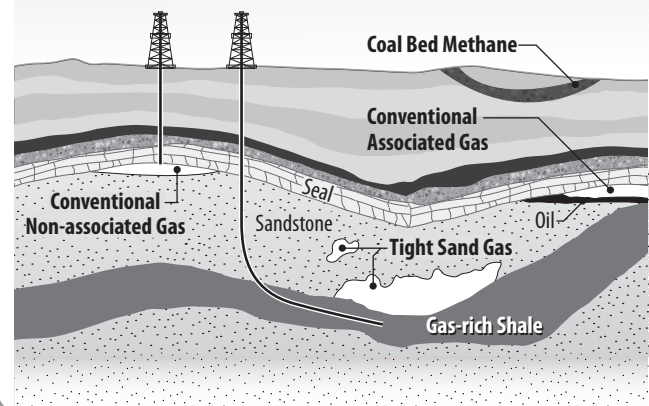
Data: Energy Information Administration

## U.S. Natural Gas Consumption by Sector, 2013



Data: Energy Information Administration

## Locations of Natural Gas



## Natural Gas and the Environment

Burning biomass or any fossil fuel, including natural gas, releases emissions into the air, including **carbon dioxide**, a **greenhouse gas**.

Natural gas and propane are the cleanest burning fossil fuels. Compared to coal and petroleum, natural gas releases much less sulfur, carbon dioxide, and ash when it is burned. Scientists are looking for new sources of natural gas and new ways to use it.