

Yankee Gas

Update:

Natural Gas

Facts

WHAT IT IS.

Natural gas is a combustible and plentiful fossil fuel composed mainly of methane and found in underground reservoirs of porous rock. It is the cleanest-burning fossil fuel, producing carbon dioxide, water vapor, and small amounts of nitrogen gases. Scientists believe natural gas was formed millions of years ago when plants and sea life were buried in sand and rock; accumulated layers of such matter were pressurized by the earth's crust and the resulting heat converted these organic elements to natural gas.

HOW IT IS PRODUCED AND TRANSPORTED.

Natural gas is released from porous rock through a well system that brings it to the surface. Since it is usually under pressure, natural gas flows freely to the wellhead. Once at the wellhead,

natural gas is moved into "gathering lines" similar to the branches of a tree, which get larger as they get closer to a central collection point. The gathering system includes compressors to keep the gas moving through the lines. Sometimes processing facilities are used to remove impurities from the product.

Natural gas then moves into a transmission system, consisting of more than 250,000 miles of high-strength steel pipe. Compressor stations are located at 50- to 60-mile intervals to boost the pressure and keep the gas moving at a rate of approximately 30 mph. This pipeline system moves the gas from the regions where it is produced to the "citygate" or "gate station," where local gas utilities become responsible for moving it through their own system of pipelines.

The gate station serves several purposes: 1) It reduces the pressure in the line for controlled transportation; 2) It adds an odorant (called mercaptan) so consumers can detect natural gas' presence; 3) It measures the rate of flow so the amount received by the utility can be monitored.

Once in the "mains" of the local gas utility, natural gas travels through pipe of varying diameters, usually getting smaller as the natural gas nears its final destination. There are different pressure zones within each local system, controlled by computerized gas regulation systems to ensure adequate pressure exists to move the product efficiently and safely.

The final step of transportation, from the main line to the home or business, takes place through a service line, normally an inch or less in diameter. This line goes through the customer's meter and travels within the home or business to various burners and appliances.

STORAGE.

Natural gas can be stored in several ways. To handle hourly fluctuations in demand, pipeline companies can raise or lower pipeline pressure to adjust the amount of natural gas within the pipeline (also known as "linepack").

To ensure an abundant supply for seasonal heating demands, pipeline operators, natural gas producers, and natural gas utilities can use geologic spaces such as depleted oil wells and salt caverns to store natural gas. Such facilities – located close to the end users – are filled during summer months and are readily available when required. Pipeline operators and natural gas utilities use advanced computer models to chart and anticipate natural gas usage on an hourly, daily and seasonal basis.

HOW IT IS USED.

Natural gas is used extensively in residential, commercial, and industrial sectors. Its original use was for home heating, and more than 55 percent of American homes use natural gas for that purpose.

Its applications have expanded to include the following:

- Radiant heating, which uses natural gas to heat large areas such as warehouses.
- Cooling, which uses natural gas-driven engines or absorption cooling to operate chillers and reduce reliance on electric-powered cooling
- Transportation, which employs low-emission natural gas-driven engines for motor vehicles
- Cogeneration, a technology that uses natural gas to produce electricity and recovers the waste heat for ancillary applications
- Fuel cells, which produce electricity and heat from natural gas through an electrochemical process, leaving only water as a byproduct
- Combined-cycle power generation, a method of producing electric power with a natural gas turbine.

KEY CHARACTERISTICS.

The dominant traits of natural gas are its clean-burning properties and plentiful domestic supply. It emits almost no sulfur dioxide or small particulate matter and far less carbon monoxide, reactive hydrocarbons, nitrogen oxides and carbon dioxide than other fossil fuels.

SOURCES AND SUPPLIES.

All the natural gas used in the United States is a product of North America. Most of the product originates in the southern and midwestern states and in the Gulf of Mexico. The total amount of recoverable resources in the United States is estimated at 1,192 trillion cubic feet, roughly a 60-year supply at current production levels. Estimates by some energy experts indicate the U.S. supply, including vast offshore reserves, would last several centuries. Canadian and Mexican reserves and production capacities are not included in these figures.

FOR MORE INFORMATION.

To get more information on natural gas and its uses, go to the Yankee Energy System web site, www.yankeenergy.com; the American Gas Association web site at www.aga.org, or the Gas Research Institute web site at www.gri.com.