



# Natural Gas Basics

## What is Natural Gas?

Natural gas is made up of hydrocarbon gases, primarily methane. Natural gas was formed millions of years ago when animals and plants died and were buried under many layers of rock and soil. Over time, the tremendous heat and pressure created by the layers of earth turned the animal and plant matter into natural gas and petroleum (oil). That's why natural gas is called a "fossil fuel."

Natural gas is found in layers of rock with tiny holes – the rock holds the gas like a sponge. Natural gas is usually found deep below the earth's surface, often with deposits of oil and is removed by wells.

## *A Brief History of Natural Gas Regulation*

The U.S. natural gas industry did not emerge until the 1920s. Instead of natural gas, there was a well-established “manufactured gas” industry that had been supplying light to cities for streetlights since the early 1800s. States were able to regulate local natural gas distribution, but they could not regulate transmission rates for the few interstate pipelines that existed. That changed in 1938 when Congress passed the Natural Gas Act, which gave the Federal Power Commission (FPC) authority to regulate interstate transmission and sales.

The Natural Gas Act regulated only transmission rates and not wellhead prices. By the 1950s, the Supreme Court of the United States had ruled that the FPC should also regulate natural gas production and gathering. In July 1954, the FPC froze wellhead prices.

The first Organization of the Petroleum Exporting Countries (OPEC) oil embargo occurred in 1973. The oil-price shocks that followed the embargo directly affected the electric industry, because oil-fired generating plants were still relatively

common. Because wellhead natural gas prices were capped, supplies began to decrease as production from existing wells declined. For the natural gas industry, predictions of complete supply exhaustion were common. To address concerns over looming energy shortages, Congress passed a broad series of bills collectively known as the National Energy Legislation of 1978. The primary goals of this legislation were to promote energy conservation and to increase production and use of domestic fuels.

The National Energy Legislation contained several key laws affecting both the electric and natural gas industries:

- **The Public Utility Regulatory Policies Act (PURPA):** encourage energy conservation and mandate that utilities purchase electric power from “qualifying” independent wholesale producers
- **The Powerplant and Industrial Fuel Use Act:** designed to encourage utilities and large industrial customers to use coal instead of natural gas
- **The National Energy Conservation Policy Act:** designed to promote energy conservation by mandating that electric and natural gas utilities promote energy efficiency by customers, including programs for financing conservation investments through utility bills
- **The Energy Tax Act:** provided tax incentives for energy conservation, renewable energy, and a “gas-guzzler” tax on low-miles per gallon (MPG) automobiles
- **The Natural Gas Policy Act (NGPA):** addressed the impact of price controls on exploration and development and set a timetable for deregulating wellhead natural gas prices

By the 1990s, a vibrant wholesale natural gas market was fully established. Deregulation of the natural gas market in the U.S. took many years to accomplish. It took passage of the Natural Gas Wellhead Decontrol Act of 1989 to abolish all remaining federal price controls on natural gas. FERC implemented several landmark orders addressing interstate pipeline deregulation:

- Order No. 380 (1984): eliminated local distribution companies’ minimum bill requirements and made it feasible for many local distribution companies (LDCs) to switch natural gas suppliers
- Order No. 436/500 (1985/1987): implemented voluntary open access on U.S. pipeline companies and dealt with economic problems arising from long-term take-or-pay contracts between producers and local distributors

- Order No. 636 (1992): unbundled transportation from marketing activities and make pipeline-affiliated companies sell their natural gas before entering into the transmission system
- Order No. 637 (2000): designed to further improve the efficiency of the market while continuing to protect against pipelines' exercising market power

After wellhead natural gas prices were fully deregulated, production and supplies exploded. Low natural gas prices, development of an independent wholesale power market, technological improvements, and growing environmental concerns about coal-fired generation, led to new, substantial investments in gas-fired generating capacity to meet growing electric demand. Natural gas became the "fuel of choice," not only for electric generation.

Recently, huge increases in shale gas production have caused wellhead prices to drop significantly. Liquefied natural gas (LNG) facilities are being modified to export natural gas, rather than import it. Accessing gas supplies requires a robust interstate pipeline infrastructure. They must first be approved by FERC.

*Source: **Fundamentals of Energy Regulation**, by Jonathan A. Lesser, PhD and Leonardo R. Giacchino, PhD*

## Why Use Natural Gas?

- **Affordable** – Because of the abundant gas resources in North America, natural gas is one of the most affordable energy resources in America today. Natural gas is an increasingly affordable energy option for residential and commercial consumers and in manufacturing, chemical production and power generation.
- **Clean** – Natural gas is the cleanest fossil fuel emitting extremely low levels of pollutants blamed for ground level smog. Compared to other fossil fuels, natural gas emits significantly less greenhouse gases, which are being blamed for global warming.
- **Safe** – The design, construction, operation, inspection and maintenance of all operating pipelines are subject to state and federal regulations and requirements. According to the U.S. Department of Transportation, pipelines are the safest, most environmentally-friendly and most efficient and reliable mode of transporting natural gas.

- **Comfortable** – The temperature of gas heat at the register is between 110-and 120-degrees Fahrenheit, which warms your home quickly and efficiently.
- **Reliable** – A properly maintained natural gas furnace will provide about 20 years of reliable service. Most natural gas cook tops, ranges, water heaters and fireplaces work in a power outage, letting you cook, bathe, and warm your home without interruption.
- **Efficient** – Natural gas furnaces and water heaters now can achieve efficiency levels as high as 98 percent.
- **Convenient** -- Natural gas provides instant heat with an adjustable temperature that can be controlled on gas cook tops or ranges and by thermostats. A natural gas fireplace lets you avoid the wood-chopping, hauling or messiness that comes with owning a wood-burning fireplace. Enjoy outdoor cooking on a natural gas grill throughout the year at a flip of a switch.