

Facts about Natural Gas

Introduction

Natural gas was once an unwanted by-product that came out of the ground with crude oil. Now it is one of the nation's most important energy resources. It is the fuel used most in homes for space heating, water heating, and cooking.

Natural gas is made of a mixture of molecules called hydrocarbons, chains of carbon and hydrogen atoms. Natural gas is mostly made of methane (CH₄) and other gaseous hydrocarbons (dry gas), although a small portion is in liquid form (wet gas).



Like crude oil, natural gas is formed when dead organisms like plankton, bacteria, and plants are deposited on shallow ocean bottoms. Sediments accumulate on top of the organic material over millions of years, and increasing pressure and temperature slowly change it into natural gas. Because they are formed in similar ways, natural gas and crude oil are often found together.

Reserves

Known U.S. reserves of natural gas in 2017 were 464.3 trillion cubic feet, most of which is found in Texas, Pennsylvania, Oklahoma, West Virginia, and Louisiana (see **U.S. Natural Gas Proved Reserves, 2017**). Wisconsin has no known reserves. Potential U.S. reserves, which include likely but as yet undiscovered gas fields, may be as much as 2,515 trillion cubic feet of technically recoverable resources (2014). The nations that make up the former Soviet Union, including Russia, have the largest reserves in the world. Russia's reserves alone account for about a quarter of the world's total proved reserves. Worldwide proven reserves stood at 708 trillion cubic feet, however, it is estimated that there were 2,561 trillion cubic feet of technically recoverable resources at the end of 2014.

Production

The energy content of natural gas is measured in Btu (British thermal units) or quads (1,015 Btu). The United States produced 28,294,939 million cubic feet of natural gas in 2016. World natural gas production for 2014 was 122,336 billion cubic feet, with the United States producing the most, followed by Russia.

Consumption

In 2016, the United States consumed 27,485,517 million cubic feet of natural gas. Of that, Wisconsin was responsible for 1.75% of that consumption at 481,987 million cubic feet of natural gas consumption (26% residential, 30% industrial, 18% commercial, and 25% electrical power).

Extracting Natural Gas

Exploring and drilling for natural gas is similar to exploring and drilling for crude oil (see [Facts about Oil](#)). Synthetic natural gas can also be produced from crude oil or coal using a process called gasification. The largest source of synthetic gas is a plant in Beulah, North Dakota, which produces more than 54 billion standard cubic feet of natural gas annually.

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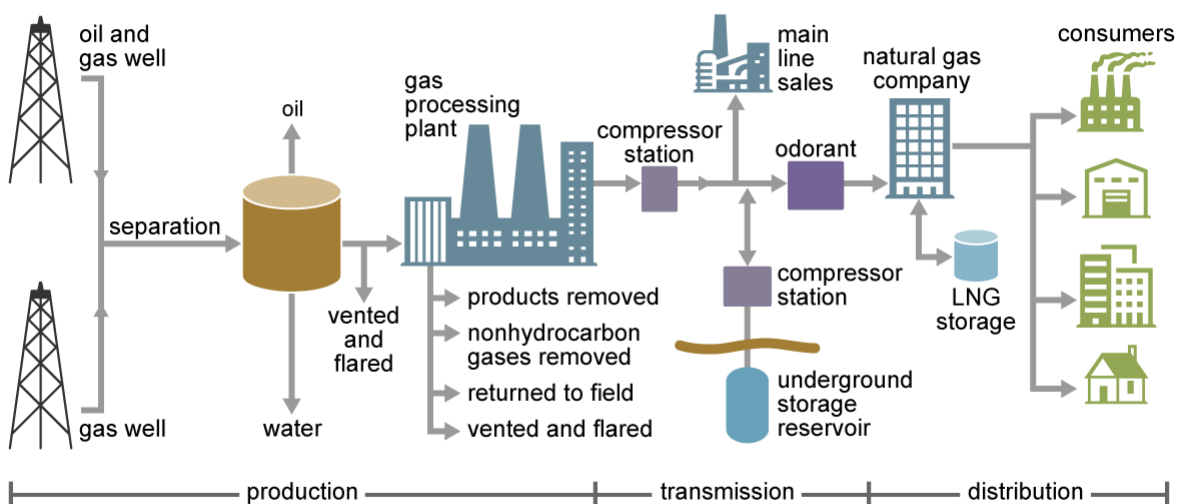
Processing and Transportation

Unlike Crude oil, natural gas does not need much processing. Liquids and methane are separated from pipeline quality dry gas near the well or at a processing plant. Because natural gas has no odor, a scent is added to it so that people can smell it if it is leaking.

After processing, pipelines transport natural gas to various destinations. Like the branches of a tree, smaller pipelines are connected to the major pipelines, and even smaller lines are connected to homes and businesses (see **Wisconsin Natural Gas Utility Service Territories and Major Pipelines, 2015**).

Because pipelines cannot always be built where gas is needed, natural gas may be chilled until it turns into a liquid. The liquid natural gas (LNG) can then be stored in special tanks and shipped to its destination. There, the LNG is changed back into a gas and piped to where it is needed.

Natural gas production and delivery



Source: U.S. Energy Information Administration

Electricity Production

Some power plants also use natural gas to produce electricity. Some of these are peaking plants; they are used when the demand for electricity is high or at its peak. But because of lower natural gas prices and increases in efficiency, natural gas is also being used as a fuel in larger base power plants. Wisconsin has natural gas-fired power plants. In June 2017, for example, natural gas-fired plants generated 1,149 thousand MWh of electricity, as compared to coal-fired plants generating 3,266 thousand MWh.

Other Uses

Besides space heating, natural gas is used to provide heat for manufacturing processes. Like crude oil, natural gas is also used to produce various products, including petrochemicals.

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Effects

Most of the natural gas used in the United States is produced domestically, so disruptions of supplies from foreign sources are not a major concern. The number of known reserves has been increasing. The natural gas industry has created many different occupations. Jobs in the heating business and appliance industry also depend on plentiful supplies of natural gas.

Natural gas is a relatively clean-burning energy resource compared to other fossil fuels. It produces about half as much carbon dioxide (a contributor to global climate change) per Btu of energy as burning coal does. Emissions of carbon monoxide and sulfur oxides are also lower. However, home heating systems that are not working properly may produce excess carbon monoxide, a poisonous gas that can cause illness or even death. On rare occasions, natural gas leaks can also lead to explosions.

Did You Know?

Because natural gas is colorless, odorless, and tasteless, natural gas companies add mercaptan to natural gas to give it a distinct and unpleasant odor to help detect leaks in natural gas pipelines. Mercaptan is a harmless chemical that smells like rotten eggs.

Outlook

Natural gas use in the United States is expected to continue to increase in the near future. Natural gas exploration within the United States continues, and new discoveries will contribute to production increases. Depending on the amount of natural gas consumed each year, imports, exports, and additions to the reserves, the United States currently has enough natural gas to last about 86 years.

References

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World Energy Council: worldenergy.org

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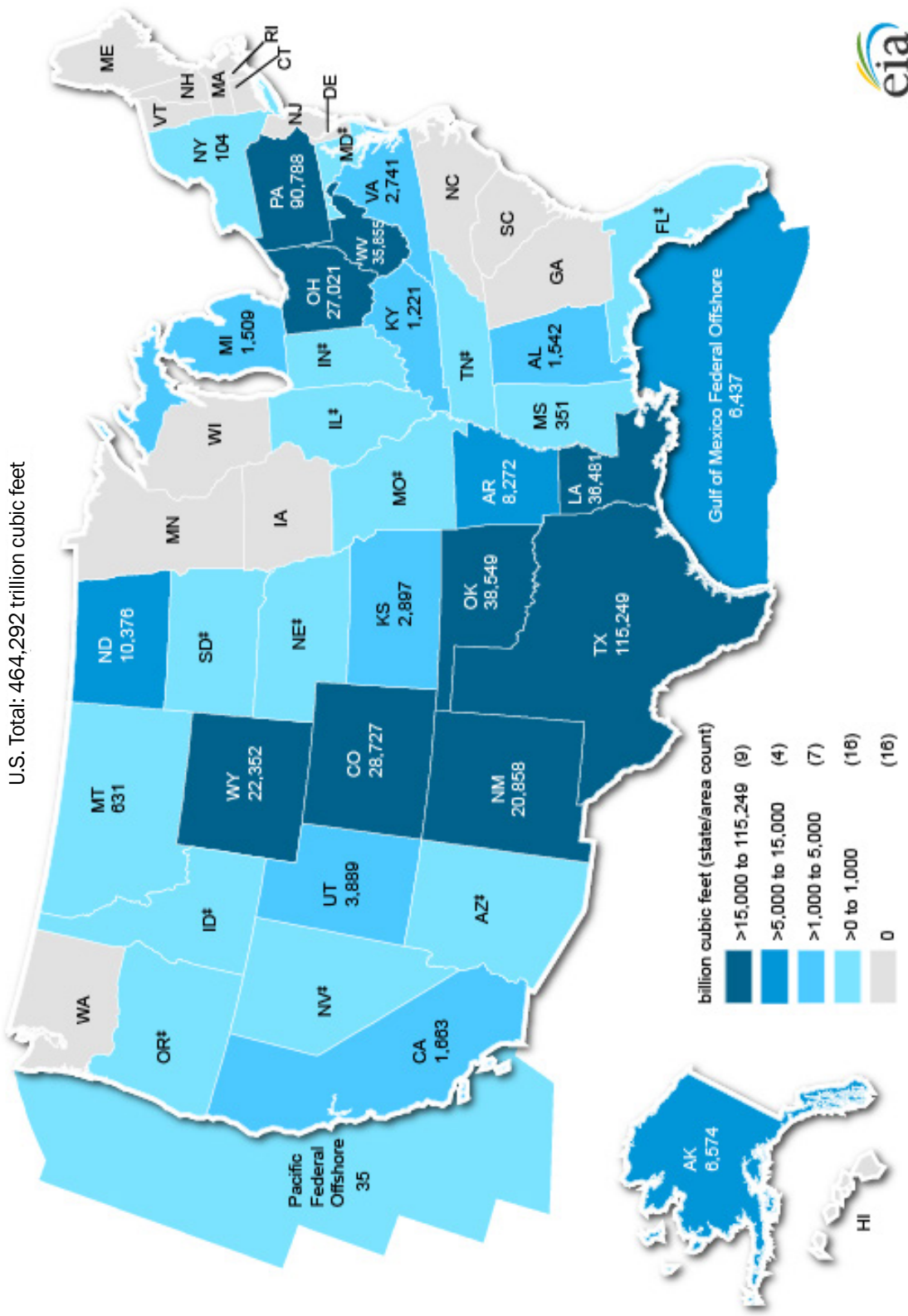
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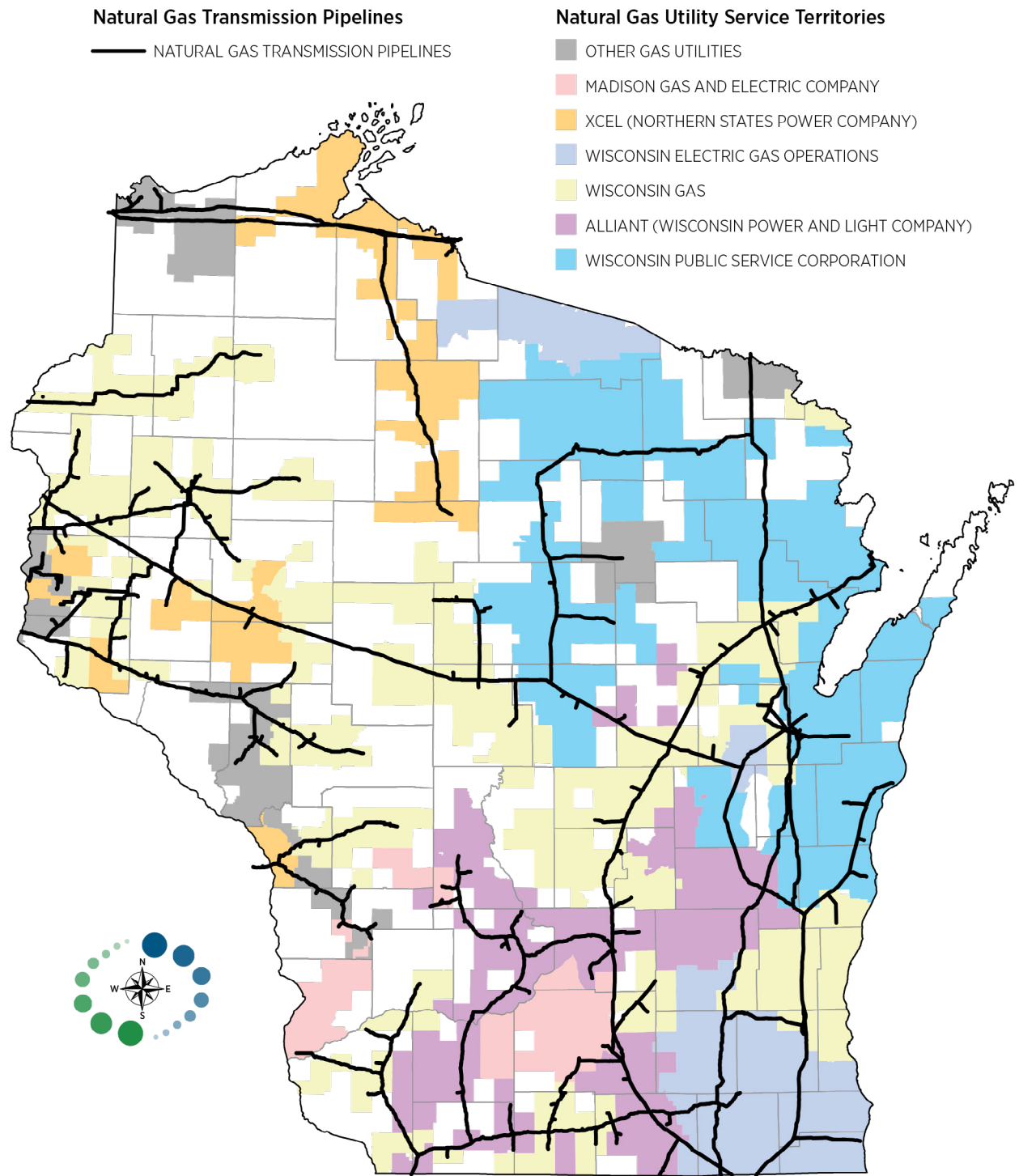


U.S. Natural Gas Proved Reserves, 2017



†Data withheld to avoid disclosure of individual company data
 Source: U.S. Energy Information Administration, Form EIA-23L, Annual Report of Domestic Oil and Gas Reserves

Wisconsin Natural Gas Utility Service Territories and Major Pipelines, 2015



Source: Wisconsin Office of Energy Innovation. Wisconsin Energy Statistics Book: [Wisconsin Energy Statistics 2018](#).