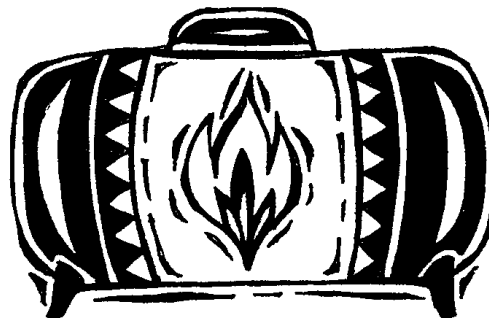


Facts about Propane

Introduction

A relative of natural gas, propane occupies a relatively small but significant place in the nation's energy mix. First produced in 1912, propane has since found many uses in the home, industry, and farm.

Propane, also known as “bottled gas,” is a colorless hydrocarbon with the chemical formula C_3H_8 . Propane can exist in both gaseous and liquid form. At room temperature and atmospheric pressure (14.7 psi) it is a gas. When tanks or containers are filled with propane they are pressurized to 100-200 psi, and the increase in pressure causes propane to condense and form a liquid. The liquid form is often called liquefied petroleum gas (LPG or LP for short). Although it is odorless, a foul-smelling scent is added to propane so that leaks can be easily detected.



Production, Processing, and Transportation

Petroleum refineries produce propane by heating and distilling crude oil. Natural gas processing plants also make propane. After production, propane is transported in liquid form by pipelines to a central distribution plant, where it is stored in large steel cylinders and tanks. From there it is transported by trains, trucks, barges, or ships to “bulk plants.” One gallon of propane in LPG form contains 84,250 Btu of energy.

Consumption

Nearly 2 percent of the U.S. energy needs are supplied LPG. In 2015, about 1 million barrels of LPG were consumed per day. Propane is a versatile fuel, with a wide variety of uses in industry, in agriculture, in homes, for transportation fuel, and for recreational purposes. Globally, the top five consumers of LPG in 2014 were the United States, China, Saudi Arabia, Japan, and India. In 2012, Wisconsin used 245 million gallons of LPG. Of this amount, over 87 percent was used for residential purposes.

Industrial Use

Nearly half of the propane consumed by industry is used to make plastic. Industries also use propane to run machinery, cut metal, and for process heat. Propane is also used to produce materials such as aerosol propellants, solvents, and synthetic vulcanized rubber.

Agricultural Use

On farms, propane is used to operate various types of farm equipment. Farmers use propane to dry crops, warm chicken coops, sterilize milk equipment, and more. As of 2017, nearly 830,000 farms in the U.S. use propane.

Household Use

Many rural homeowners who do not have access to natural gas pipelines rely on propane for space heating, water heating, and clothes drying. Roughly 8% of the homes in the Midwest are heated with propane fuel, and nationally about 7 million households use propane for space heat. Household use of LPG in 2014 accounted for 44 percent of global propane consumption.

Did You Know?

Propane gas has no odor, color or taste. Propane companies add a harmless chemical called mercaptan to give it its distinctive “rotten egg” smell to help detect leaks.

Facts about Propane

Cooking Use

In the United States, 47 million households use propane to fuel an outdoor gas grill. Restaurants and caterers use propane for cooking and warming food, and also to fuel patio heaters for outdoor seating areas in cold climates. People often use propane for outdoor cooking, and because of its portability, it is especially popular with campers and mobile homeowners.

Transportation Use

Propane is the energy source for more low emission vehicles than any other fuel (including ethanol, electricity, fuel cells, and solar cells). Because propane is a very clean burning fuel with very low emissions, it is especially ideal for equipment such as forklifts and lift trucks that operate in warehouses or construction sites where indoor air quality is important. It is also suitable for operating equipment in underground mines and other enclosed spaces. Propane is used as a fuel for vehicle fleets with access to centralized LPG fueling stations (such as buses or taxis), especially in urban areas that are seeking to reduce tailpipe exhaust emissions.

Electrical Production Use

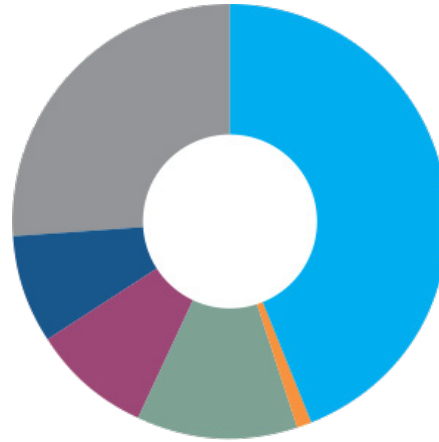
Some utilities use propane to fuel backup electrical generators when the demand for electricity is very high, or if there is a disruption in the supply of other energy sources. However, most electric power plants do not use much propane fuel, because it costs less to produce electricity from other energy sources such as solar, wind, hydropower, natural gas, coal or uranium.

Effects

Propane has helped many rural residents by providing them with a relatively clean-burning and reliable fuel. Propane distribution and sales of propane-related equipment have helped support rural economies.

Like natural gas, propane is one of the cleanest burning fossil fuel products, releasing negligible amounts of emissions. When burned, it leaves no ash and produces practically no sulfur oxides, particulate matter, or mercury emissions. On the other hand, burning propane produces carbon dioxide, a cause of global climate change, and it also emits nitrogen oxides which are key ingredients in the formation of urban smog and ozone.

LP Consumption by Sector, 2015



Domestic 44%



Agriculture 1%



Industry 12%



Transport 9%



Refinery 8%



Chemical 26%

Source: [World LPG Association Annual Report 2016](#).

Facts about Propane

Outlook

Because it is made from crude oil and natural gas, future supplies and production of propane are based on the continued discovery and production of these fossil fuels. (See [Facts about Oil](#) and [Facts about Natural Gas](#)). Due to its limited volume of production, propane is unlikely to replace the use of petroleum products such as diesel fuel or gasoline. However, because of its clean burning properties, there will most likely be continued demand for propane fuel for applications where air quality is of major concern, especially in geographic regions where clean burning natural gas is not available.

References

Alternative Fuels Data Center: www.afdc.energy.gov

Propane Clean American Energy: propane.com

Propane Education and Research Council: propane.com/about/about-perc

Wisconsin Office of Energy Innovation. Wisconsin Energy Statistics Book: psc.wi.gov/Pages/Programs/OEI/WisconsinEnergyStatistics.aspx

© 2020 Wisconsin Center for Environmental Education

The Wisconsin K-12 Energy Education Program is supported through funding from



Wisconsin K-12 Energy Education Program (KEEP)
College of Natural Resources
University of Wisconsin - Stevens Point

