

What Is Natural Gas?



Natural gas is a mixture of hydrocarbons—mainly methane (CH₄)—and is produced either from gas wells or in conjunction with crude oil production. Natural gas is consumed in the residential, commercial, industrial, and utility markets. The interest in natural gas as an alternative fuel stems mainly from its clean burning qualities, its domestic resource base, and its commercial availability to end users. Because of the gaseous nature of this fuel at ambient conditions, it must be stored onboard a vehicle in either a compressed gaseous state (CNG) or in a liquefied state (LNG) to provide sufficient fuel storage for reasonable driving range. According to Energy Information Association, estimates place our domestic supply of natural gas at more than 50 years assuming current consumption rates.

How Is Natural Gas Made?

Most natural gas consumed in the United States is domestically produced. Gas streams produced from reservoirs contain natural gas, liquids, and other materials. Processing is required to separate the gas from petroleum liquids and to remove contaminants. In addition, natural gas (methane) can also come from landfill gas and water/sewage treatment. Natural gas processing starts with the gas being separated from free liquids such as crude oil, hydrocarbon condensate, water, and entrained solids. The separated gas is further processed to meet specified requirements. For example, natural gas for transmission companies must generally meet certain pipeline quality specifications with respect to water content, hydrocarbon dewpoint, heating value, and hydrogen-sulfide content.

What Vehicles Can Use It?

According to Natural Gas Vehicles for America (NGVAmerica), as of 2005 there were 130,000 light- and heavy-duty compressed natural gas (CNG) and liquefied natural gas (LNG) vehicles in the United States and 5 million vehicles worldwide.

There are two types of natural gas vehicles (NGVs): dedicated and bi-fuel. Dedicated NGVs are designed to run only on natural gas; bi-fuel NGVs have two separate fueling systems that enable the vehicle to use either natural gas or a conventional fuel (gasoline or diesel). In general, dedicated NGVs achieve better performance and have lower emissions than bi-fuel vehicles because their engines are optimized to run on natural gas. In addition, dedicated vehicles do not have to carry two types of fuels, thereby increasing cargo capacity and reducing weight.

Honda Civic GX is currently the only commercially available light-duty NGV. Heavy-duty NGVs are also available as trucks, buses, and shuttles. In fact approximately one of every five new transit buses in the United States is powered by natural gas. Several small vehicle manufacturers (SVMs) provide installation of conversion systems for converting a number of new and existing light- and heavy-duty vehicle models to operate on natural gas.



Why Should We Use It?

Natural gas is one of the cleanest burning alternative fuels available and offers a number of advantages over gasoline. In light-duty applications, exhaust emissions from natural gas vehicles are much lower than those from gasoline-powered vehicles. In addition, smog-producing gases, such as carbon monoxide and nitrogen oxides, are reduced by more than 90% and 60%, respectively, and carbon dioxide, a greenhouse gas, is reduced by 30%-40%. For heavy-duty and medium-duty applications, natural gas engines have demonstrated more than 90% reduction of CO and particulate matter, and more than 50% reduction of NO_x relative to commercial diesel engines.

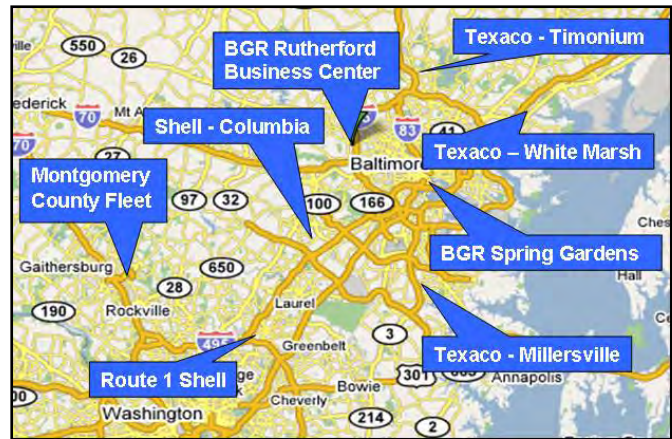
In general, a natural gas vehicle can be less expensive to operate than a comparable conventionally fueled vehicle depending on natural gas prices and fleet operational practices. Natural gas can cost less than gasoline and diesel (per energy equivalent gallon); however, local utility rates can vary. Purchase prices for natural gas vehicles are somewhat higher than for similar conventional vehicles. The auto manufacturers' typical price premium for a light-duty CNG vehicle can be \$1,500 to \$6,000, and for heavy-duty trucks and buses it is in the range of \$30,000 to \$50,000.

Where Can I Get It in Maryland?



There are over 1,500 NGV fueling stations in the U.S. - over half are available for public use. Currently, there are 17 CNG fueling stations in Maryland (map), eight of which are open to the general public. Their addresses can be

found in the U.S. Department of Energy's database of alternative refueling stations (including natural gas) at <http://www.eere.energy.gov/afdc/infrastructure/locator.html>.



What is the State Doing for Natural Gas Use?

Maryland established an alternative fuel vehicle (AFV) goal under the plan for 'Sustaining Maryland's Future with Clean Power, Green Buildings and Energy Efficiency.' Under this plan, the state will revise fleet policy and purchasing guidelines to offer more flexibility in purchasing, where practical, low emission vehicles and AFVs for its fleet. The state will also ensure that an average of 50% of the fuel used by bi-fuel vehicles will be alternative fuel. Further, the state plans on assisting in the development of the refueling and maintenance infrastructure required to make using certain types of AFVs practical. And the state may provide technical assistance and other incentives to use clean technology, where practical, in state transit fleets. The state operates 170 CNG vehicles in its fleet and has supported use of CNG buses at the BWI Airport.

What is the Federal Government Doing for Natural Gas Use?

Section 1342 of the Energy Policy Act of 2005 (EPAct) provides a tax credit equal to 30% of the cost of natural gas refueling property, up to \$30,000 for business property. Buyers of residential refueling equipment can receive a \$1,000 tax credit. For non-tax-paying entities, the credit can be passed back to the equipment seller. The credit is effective on equipment put into service after December 31, 2005 and expires December 31, 2009.

Section 1341 of EPAct provides a tax credit to buyers of new alternative fuel vehicles placed in service after January 1, 2006. The legislation provides for a tax credit equal to 50% of the incremental cost of the vehicle, plus an additional 30% of the incremental cost for vehicles with near-zero emissions (SULEV). The credit is available on the purchase of light-, medium, and heavy-duty dedicated natural gas vehicles. For non-tax-paying entities, the credit can be passed back to the vehicle seller. The tax credit can be applied to vehicle purchases made after December 31, 2005. The credit expires December 31, 2010. This tax credit extends to vehicle conversions when the conversion system manufacturer has received a certificate of conformity from the EPA or California Air Resources Board.



Where Can I Find More?

For more general information on natural gas and natural gas vehicle, you can visit the NGVAmerica:

<http://www.ngvc.org/>

Or the U.S. Department of Energy:

http://www.eere.energy.gov/afdc/altfuel/natural_gas.html

For more information on the Maryland Clean Cities Program and how you can help:

<http://www.energy.state.md.us/programs/transportation/cleancities/index.html>

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www.energy.state.md.us