For decades, natural gas has provided clean power to thousands of households and businesses nationwide. Today, more than 1,000 vehicles traveling U.S. roads are powered by natural gas that is cooled to a liquid—liquefied natural gas (LNG). LNG results when natural gas is cooled to temperatures of 260 degrees below zero, thus producing a viable vehicle fuel used mainly in heavy-duty trucks and buses.

LNG is odorless, colorless, noncorrosive, and nontoxic. When extracted from underground reserves, natural gas is composed of approximately 90 percent methane. During the liquefaction process, oxygen, carbon dioxide, sulfur compounds, and water are removed, purifying the fuel and increasing its methane content to almost 100 percent. As a result, LNG-fueled vehicles can offer significant emissions benefits compared with older diesel-powered vehicles, and can significantly reduce carbon monoxide and particulate emissions as well as nitrogen oxide emissions.

To date, LNG vehicles have primarily been used by fleet managers. Therefore, most LNG refueling stations are located at heavy-duty vehicle fleet operations not open to the public. This is due in part to the various safety issues discussed later. In conjunction with plans to expand LNG use in long-haul trucking in the West, efforts are under way to improve access to LNG fueling stations in that region. For example, California expects to fund the development of public-access facilities. Such a program is aimed at helping heavy-duty trucks switch to natural gas.

LNG’s complex onboard storage system does not make it a viable fuel for light-
duty vehicles. It is, however, replacing diesel in many heavy-duty trucks and buses and many new gas-fueled locomotives. For example, some trash trucks in San Diego and some long-haul trucks in Los Angeles and Sacramento use LNG fuel. In addition, the number of LNG-fueled transit buses is expanding rapidly as many cities try to reduce air pollution levels. Bus fleets in Orange County, California, and Phoenix, Arizona, are fueled entirely by LNG.

**SAFETY**

A LNG vehicle parked indoors and unmoved for a week or more will vent a flammable gas mixture that could catch fire in the vicinity of an ignition source. To address this safety issue, LNG use should be restricted to frequently driven fleet vehicles or to vehicles stored outdoors. Only trained personnel should service the vehicles.

In addition, refueling vehicles with LNG requires training because of the fuel's ultra low temperature. It can cause frostbite if it contacts skin. Since LNG is almost 100 percent methane—a greenhouse gas—it can also contribute to global climate change if accidentally released into the air. Methane is slightly soluble in water and, under certain environmental conditions (anaerobic), it does not bio-degrade. If excess amounts accumulate, the gas can bubble from the water, possibly creating a risk of fire or explosion.

**MAINTENANCE**

LNG’s cleaner burning characteristics can result in longer engine life and reduced maintenance costs. Using LNG eliminates the need for periodic tank inspections. In addition, some maintenance savings are anticipated for vehicles using LNG when compared with gasoline-powered vehicles because of the reduced frequency of oil changes. Because of the fuel’s below freezing temperatures, only trained personnel should maintain LNG vehicles.

For More Information

EPA Alternative Fuels Web Site
www.epa.gov/otaq/consumer/fuels/altrfuels/altrfuels.htm

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Alternative Fuel Refueling Station Locator
Web site: afdcmapp.nrel.gov/nrel

Alternative Fuels Data Center
Web site: www.afdc.nrel.gov

National Alternative Fuels Hotline
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