



# NATURAL GAS VEHICLE NGV TALK

*Fuel for the Future*



December 2013

## Why natural gas vehicles

With proven reserves of domestic natural gas soaring (100+ years) and our dependence on foreign oil as burdensome as ever, it only makes sense to start using clean, inexpensive and abundant natural gas as a vehicle fuel. Natural Gas Vehicles (NGVs) are good for our economy, our environment and your bottom line. Whether you're an individual or a fleet manager, never before have there been so many natural gas products and services available, spurred by unprecedented industry investments and government incentives.

## What is natural gas?

Natural gas primarily consists of methane (around 90 percent), with small amounts of ethane, propane and other trace gases. Methane is a simple gas molecule made up of one carbon atom and four hydrogen atoms (CH<sub>4</sub>). It is lighter than air and burns almost completely, leaving carbon dioxide and water as combustion by-products.

## MLGW opens compressed natural gas station to public

On July 10, MLGW marked a new era with the grand opening ceremony of the first compressed natural gas (CNG) public fueling station in Shelby County at the North Service Center. Located at 1130 Tupelo, the station offers drive-up fueling for natural gas vehicles.

Across the nation, many companies are turning to natural gas powered vehicles in order to cut their fuel costs. Currently, CNG prices (per Gasoline Gallon Equivalent) average about half that of gasoline.

"It is our role to enable the public in a multifaceted approach," said MLGW President and CEO *Jerry R. Collins Jr.* "Natural gas vehicles are good for our economy, our environment and the customer's bottom line so we wanted to make sure we have CNG available to customers in Shelby County."

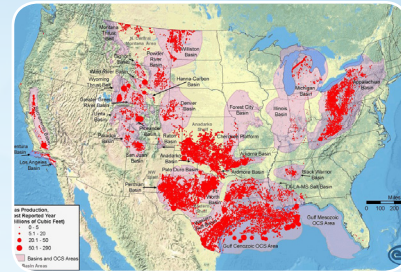
MLGW has 71 natural gas vehicles and plans to expand its fleet and build four additional public CNG fueling stations around Shelby County.



*On hand for the ribbon-cutting ceremony to open the area's first public CNG station were (left to right): Paul Rice, West Tennessee Clean Cities Coalition; Alonzo Weaver, VP, Engineering Operations; Michael Taylor, Commercial and Industrial Customer Care; Ray Ward, Gas Engineering; Rick Bohne, AutoNation and Virgil Deanes, Gas Engineering and Operations.*

## Why use natural gas as a fuel?

- Urban combustion engine and greenhouse gas emissions are inherently lower than emissions from gasoline or diesel fuel.
- Natural gas use decreases our reliance on foreign fuel sources as more than 98 percent of the natural gas used in the U.S. comes from North America.
- Natural gas costs less per unit of energy than gasoline or diesel.



Source: Energy Information Administration based on data from HPDI, IN Geological Survey, USGS Updated: April 8, 2009.

## How is natural gas used as a vehicle fuel?

Compressed natural gas, or CNG, is the most common form of natural gas used in vehicles. Heavy-duty vehicles often use liquefied natural gas or LNG. CNG is stored on the vehicles at around 3600 psi (in gaseous form) while LNG is stored at -260°F (in liquid form).

## Do NGVs operate differently than gasoline or diesel-fueled vehicles?

NGVs operate on the same basic principles as gasoline-powered vehicles. When the engine is started, CNG flows from a storage tank into a fuel line. The CNG then passes through a regulator that reduces the pressure of the gas. The gas then enters a fuel-injection system which introduces the fuel into the cylinders. Computers with sensors adjust the fuel-air mixture so a spark plug can ignite the gas, burning it cleanly and efficiently. For LNG, the liquefied natural gas is simply heated, converting back to its gaseous form. From there on, the process is the same as with CNG engines.

## What kinds of vehicles use natural gas?

Natural gas vehicles are available in all classes of personal and commercial vehicles in both dedicated and bi-fuel models. Vehicles are available from original equipment manufacturers as well as small-volume manufacturers that convert existing vehicles to run on natural gas. Vehicles converted by small-volume manufacturers meet all government safety and emission requirements.

Available vehicles range from light-duty compacts to heavy-duty buses, refuse trucks and semis. More than 50 different light-duty sedans, vans and pick-ups are available. Factory-built natural gas options are available from all the major refuse truck chassis manufacturers and body-outfitters, most of the transit and shuttle bus builders, two of the top three school bus builders, major street-sweeper manufacturers, and leading truck builders Freightliner, Peterbilt and Kenworth.

## How are NGVs fueled?

NGVs are fueled similarly to other vehicles. The dispenser looks about the same but with a different fill-nozzle. It's easy for drivers to learn how to fill a NGV. Because natural gas is under pressure, the storage systems are designed so no fuel escapes while fueling the vehicle. The fill-nozzles lock securely onto the storage tank receptacles forming a leak-free seal similar to that of an air compressor. The storage tank receptacles are designed to prevent gas from escaping when the nozzle is removed.



