

**NATURAL GAS:
THE CLEAN, ABUNDANT,
AFFORDABLE AND
AMERICAN ENERGY
ALTERNATIVE**

Natural Gas Is Clean

- Natural gas is *the cleanest commercially available transportation fuel*.

Per unit of energy, natural gas is less carbon intensive than any other fossil fuel. This means using natural gas as a motor vehicle fuel typically produces lower carbon dioxide (CO₂) emissions than gasoline and diesel fuel. Numerous studies and reports attempt to rate the relative well-to-wheels greenhouse gas (GHG) emission benefits of different fuels. Such studies look not only at the end-use impact of burning a fuel but also the energy intensity and other emissions associated with the upstream production of different fuels. In 2012, the National Petroleum Council (NPC) produced an exhaustive study on the future of transportation fuels. The NPC study summarizes the findings of available studies with respect to natural gas vehicles (NGV) as follows: light duty NGVs provide a 7–30 percent reduction in GHG emissions and heavy duty NGVs provide an 11–29 percent reduction in GHG emissions.

- The most significant environmental benefits associated with NGVs will be found in applications where new, high fuel use NGVs are used to replace older, less efficient vehicles. Refuse trucks and transit buses are examples of these vehicles. This is particularly true since the level of fuel consumption and the total amount of fuel consumed have a direct impact on overall emissions of GHGs.
- It is also possible to achieve more significant environmental benefits by using renewable natural gas in natural gas vehicles. *Renewable* natural gas, which is odorized biomethane produced from waste products such as sewage and animal waste, reduces carbon emissions by almost 90 percent when compared to gasoline and diesel fuel. Therefore, blending conventional supplies of natural gas with renewable natural gas holds great promise of reducing greenhouse gas emissions.

- How clean are natural gas vehicles from the standpoint of criteria pollutants? Natural gas is inherently cleaner than petroleum motor fuels because it is a less complex fuel and it takes less emission controls to offset engine-out emissions. Over the years, this point has been underscored by a number of achievements. NGVs were the first motor vehicles to certify to ultra-low emission vehicle and super-ultra-low emission standards, and a natural gas engine was the first engine to certify to the demanding 2010 heavy duty engine standards. Also, the natural gas fueled Civic Natural Gas, which is manufactured by American Honda, has been recognized by U.S. EPA as the cleanest commercially available internal-combustion vehicle on earth, and it was awarded the title “Greenest Vehicle” nine consecutive years by the American Council for An Energy-Efficient Economy (ACEEE). Today, these emission benefits are not as pronounced as they once were as gasoline- and diesel-fueled vehicles are now certified to very demanding emission levels. However, NGVs are expected to continue to benefit from future refinements in automotive technology (e.g., direct-injection, turbo-charging, light-weighting, hybrid drive-trains, etc.), and should continue to have an edge over their petroleum-fueled counterparts in terms of emissions performance.

Natural Gas Is Abundant

- Domestic reserves of natural gas are estimated to be twice that of petroleum based upon current consumption—more than 100 years.
- Approximately 22–23 trillion cubic feet of natural gas have been consumed each year in the United States since 1995.
- Can U.S. natural gas supply sources meet growing market demand for natural gas? The simple answer is *yes*, and this is supported by a number of natural gas supply analyses.
- For 15 of the last 16 years, the U.S. has added more gas to its domestic reserves than it has produced and used.
- Worldwide, *natural gas reserves are greater than petroleum.*
- A 1998 U.S. Department of Energy study estimated that, worldwide, between 25 and 37 quadrillion Btu of methane is released each year into the atmosphere due to the natural decomposition of organic material. In the U.S., the report states that it is feasible to capture and use about 1.25 quadrillion Btu produced

from landfills, sewage and animal waste alone. This is equivalent to approximately 6 percent of all the natural gas used in the U.S.

Natural Gas Is Affordable

- Natural gas has been 25–42 percent cheaper than diesel over the last 14 years; EIA’s Annual Energy Outlook projects that this favorable cost-spread will continue into the future.
- Transit buses that use natural gas can expect a fuel cost savings of \$20,000 or more annually when compared to conventional diesel buses.
- *Natural gas costs, on average, over one-third less than conventional gasoline at the pump. Depending on the market, that savings can be \$1.50 or more per gasoline gallon equivalent (GGE).*

Natural Gas Is American

- *Ninety-eight percent of all the natural gas consumed in the U.S. is produced in North America, while nearly 55 percent of the crude oil we use is imported.*
- There are about 1,250 NGV fueling stations in the U.S. and more than half are available for public use.
- The necessary natural gas fuel distribution infrastructure is already in place—more than 1.5 million miles of natural gas pipelines and distribution lines blanket the U.S., making supplies readily available for new fueling stations.

Natural Gas Vehicles Are Widely Used

- Use of NGVs is widespread and growing—*there are approximately 120,000 NGVs on U.S. roads today and about 15 million worldwide.*
- Major companies using NGVs in the U.S. include AT&T, UPS, Verizon, Waste Management and Republic Services; and natural gas-powered buses operate in many of the largest metropolitan areas such as Los Angeles, New York, Dallas-Ft Worth, Atlanta, Boston, Washington, D.C. and dozens of secondary markets and small communities.

- About 30 different manufacturers produce 100 models of light-, medium- and heavy-duty natural gas vehicles and engines in the U.S.
- In the U.S., natural gas vehicles can be factory ordered from a variety of original equipment manufacturers (OEM), including companies such as Allianz-Johnston, American Honda, American LaFrance-Condor, Autocar, Blue Bird, Capacity, Chrysler Ram Commercial Truck, Crane Carrier, Eldorado, Elgin, Freightliner Truck, General Motors, Gillig, Kalmar, Kenworth, Mack, Motor Coach Industries, Navistar, New Flyer, North American Bus Industries (NABI), Peterbilt, Schwarze, Thomas Built, Tymco, Vehicle Production Group and Volvo.
- An even larger number of specialty vehicle, small volume manufacturers (SVM) offer EPA-certified (or EPA-listed/approved) and/or CARB-certified conversions (retrofits and repowers) of many popular light-, medium- and heavy-duty vehicles and engines. These include Altech-Eco, American Power Group, Auto Gas America, BAF Technologies, Clean Air Power, EcoDual Group, Go Natural CNG, Greenkraft, IMPCO Automotive, Landi Renzo/Baytech, NatGasCar, NGV Motori, Omnitek Engineering, Parnell USA, Peake Fuel Solutions, PowerFuel CNG Systems and Westport LD.
- NGVs are used in a variety of fleets including taxi and shuttle services; food, beverage and other local delivery businesses; 3PL/regional haulers; refuse companies; school bus fleets; transit agencies; and a wide variety of private and public vocational applications such as concrete mixers, sweepers, dump trucks, plows and bucket trucks.