

# Benefits of NGVs

## Greenhouse Gases

Per unit of energy, natural gas contains less carbon than any other fossil fuel, and thus produces lower carbon dioxide (CO<sub>2</sub>) emissions per vehicle mile traveled. While NGVs do emit methane, another principle greenhouse gas, any slight increase in methane emissions would be more than offset by a substantial reduction in CO<sub>2</sub> emissions compared to other fuels.

NGVs also emit very low levels of carbon monoxide (approximately 70 percent lower than a comparable gasoline vehicle) and volatile organic compounds. Although these two pollutants are not themselves greenhouse gases, they play an important role in helping to break down methane and other greenhouse gases in the atmosphere, and thus increase the global rate of methane decomposition. This more rapid breakdown could more than offset the small increase in direct methane emissions from NGVs.

## Emissions

Exhaust emissions from a typical NGV are much lower than those from gasoline-powered vehicles. For example, the natural gas-powered Honda Civic GX's emissions are well below the most stringent ultra low emission vehicle (ULEV) standard and is certified as an inherently low emission vehicle by federal standards. The actual emissions are 1/10 of the ULEV standard, making it a "nearly zero" emission vehicle. Typical dedicated NGVs can reduce exhaust emissions of:

- Carbon monoxide (CO) by 70 percent
- Non-methane organic gas (NMOG) by 87 percent
- Nitrogen oxides (NO<sub>x</sub>) by 87 percent
- Carbon dioxide (CO<sub>2</sub>) by almost 20 percent below those of gasoline vehicles.



The diagram below shows how some alternative fuel vehicles stack up against a vehicle powered by reformulated gasoline on combined CO and NO<sub>x</sub> emissions. CNG vehicles demonstrate an 80 percent reduction in these ozone-forming emissions.

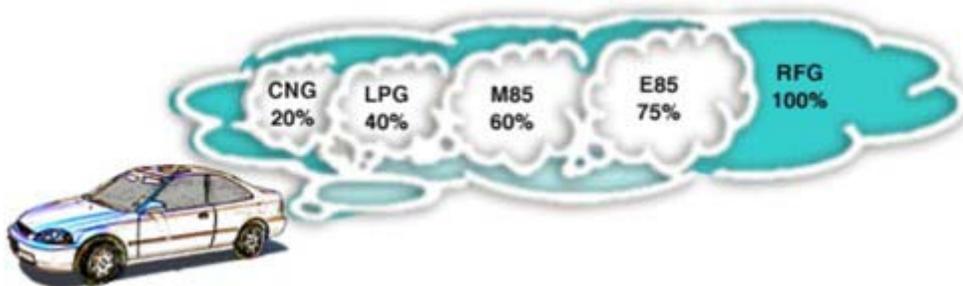


Diagram courtesy of the Alternative Fuel Data Center

## **Environmental and Health Benefits**

Dedicated NGVs produce little or no evaporative emissions during fueling and use. In gasoline vehicles, evaporative and fueling emissions account for at least 50 percent of a vehicle's total hydrocarbon emissions.

Exposure to the levels of suspended fine particulate matter found in many U.S. cities has been shown to increase the risk of respiratory illness. Diesel exhaust is under review as a hazardous air pollutant. Natural gas engines produce only tiny amounts of this matter.

## **Safety**

CNG, unlike gasoline, dissipates into the atmosphere in the event of an accident. Gasoline pools on the ground creating a fire hazard.

The fuel storage cylinders used in NGVs are much stronger than gasoline fuel tanks. The design of NGV cylinders are subjected to a number of federally required "severe abuse" tests, such as heat and pressure extremes, gunfire, collisions and fires.

NGV fuel systems are "sealed," which prevents any spills or evaporative losses. Even if a leak were to occur in an NGV fuel system, the natural gas would dissipate into the atmosphere because it is lighter than air.

Natural gas has a high ignition temperature, about 1,200 degrees Fahrenheit, compared with about 600 degrees Fahrenheit for gasoline. It also has a narrow range of flammability that is, in concentrations in air below about 5 percent and above about 15 percent, natural gas will not burn. The high ignition temperature and limited flammability range make accidental ignition or combustion of natural gas unlikely.

Natural gas is not toxic or corrosive and will not contaminate ground water. Natural gas combustion produces no significant aldehydes or other air toxins, which are a concern in gasoline and some other alternative fuels.

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## **Target Audience**

NGVs are most practical for fleets because fleets generally operate a number of vehicles that are centrally maintained and fueled, and travel more miles daily than the average personal use vehicle.

Examples:

- taxi cabs
- street sweepers
- transit buses
- school buses
- airport shuttles
- over-the-road trucks
- ice resurfacers
- refuse haulers
- delivery vehicles
- forklifts

For more information about on-site Natural Gas Vehicle Fueling Equipment, Contact:  
CNG Services of Arizona  
Authorized FuelMaker Dealer for Arizona 480-461-5166 or [www.CNGaz.com](http://www.CNGaz.com)

