

ISSUE BRIEF

Compressed Natural Gas (CNG)

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The waste and recycling collection industry operates a fleet of more than 100,000 collection trucks.¹ This fleet is being transformed through the use of alternative fuels, especially natural gas. These unique heavy-duty trucks historically use diesel fuel. If the entire fleet was to switch to alternative fuels, it could reduce diesel fuel consumption by as much as two billions gallons a year, leading to dramatically reduced emissions.²

Currently more than 7,500 industry trucks have switched from diesel to compressed natural gas (CNG) or liquefied natural gas (LNG) in North America.³ Many companies within the industry intend to replace their diesel-fueled trucks with alternatively fueled trucks. In fact, 50 percent of new orders for waste collection trucks in the United States are natural gas powered. These trucks are cleaner, quieter and reduce our dependence on foreign oil.

How Do Compressed Natural Gas Trucks Operate?

Compressed Natural Gas vehicles operate on the same basic principles as diesel gasoline-powered trucks. Because this fuel is a gas, however, and not a liquid, fuel storage and delivery systems are different than for diesel trucks as well as the refueling nozzle and receptacle. The compressed natural gas is stored in a fuel tank, or cylinder, typically at the back of the vehicle. A CNG fuel system transfers high-pressure natural gas from the fuel tank to the engine. The pressure is then reduced to a level compatible with the engine fuel management system.

What is the Difference Between CNG and LNG?

CNG and LNG are generally the same fuel, but stored differently. CNG is a gas that is drawn from a local utility pipeline that is near the fueling station. It then travels to a compressor station where it is compressed to more than 3,000 PSI and either stored in high pressure storage cylinders for later dispensing or dispensed directly into a truck. The fuel is stored in onboard cylinders.

There are two types of liquefied natural gas, cold LNG and warm LNG. Cold LNG is cryogenically cooled to -260F degrees, warm LNG is maintained at its saturation point, the point where it turns from liquid to vapor. LNG, however, is not compressed and takes up 30 percent of the space needed for CNG. LNG is liquefied and shipped to customers via over-the-road tanker trailers.

What are the Environmental Advantages of Using CNG or LNG Instead of Diesel Fuel?

- 20-25 percent reduction in greenhouse gas emissions⁴
- Up to 50 percent reduction in nitrogen oxide emissions⁵
- 70-90 percent reductions in carbon monoxide emissions⁵
- 67-94 percent lower particulate matter emissions²
- Significant reductions in emissions of non-methane organic gases²

What are the Other Advantages of CNG or LNG Waste Collection and Recycling Trucks?

- Reduced noise pollution because they operate at a 80-90 percent lower decibel rate than diesel trucks.⁶
- Drivers and crews prefer them because of smoother operation and a quieter ride.
- Use of CNG will offset more than 885 million gallons of gasoline and diesel per year by 2022.
- CNG-fueled trucks may also be fueled with processed landfill gas, which dramatically reduces greenhouse gas emissions even over the reductions caused by using CNG or LNG.
- This “biogas” fuel offers up to 90 percent emission reduction when compared to diesel.⁷



What are the Challenges of Using Natural Gas Fueled Trucks?

- CNG or LNG fueled trucks are more expensive than diesel-powered trucks due to the different fuel storage and the delivery system.
- Truck maintenance facilities must be upgraded.
- The added costs of new fueling infrastructure must be sited and built.

1 Estimate based on “Vehicle Use and Industry Survey”, U.S. Census Bureau

2 “Greening Garbage Trucks, New Technologies for Clean Air”, Inform, 2005

3 January 2014 estimates based on data from the industry and the Natural Gas

Vehicles for America

4 “Tomorrow’s Trucks, Leaving the Era of Oil Behind” Energy Vision, 2013

5 Natural Gas Vehicles for America, 2013

6 “Natural Gas Refuse Trucks: Driving Change in New York City”, Inform, 2006

7 “Renewable Natural Gas: The Solution to a Major Transportation Problem”,

Energy Vision, 2012.

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