



# GREENING THE FLEET: ALTERNATIVE FUEL VEHICLES FOR THE WASTE AND RECYCLING INDUSTRY

The waste and recycling collection industry operates a fleet of more than 100,000 collection trucks.<sup>1</sup> 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 billion gallons a year, leading to dramatically reduced emissions.<sup>2</sup>

Currently more than 7,500 industry trucks have switched from diesel to compressed natural gas (CNG) or liquefied natural gas (LNG) in North America.<sup>3</sup> Many companies within the industry intend to replace their diesel-fueled trucks with alternatively fueled trucks. Currently, 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 imports.

## How do natural gas trucks operate?

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.

## What is the difference between CNG and LNG?

CNG 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 3,600 PSI and either stored in cylinders for later dispensing or dispensed directly into a truck. The fuel is stored in onboard cylinders.

LNG is natural gas that is cryogenically cooled to -260 F degrees. Then the gas is liquefied and shipped to customers via over-the-road tanker trailers. LNG storage takes up 30 percent of the space needed for CNG.

## What are the environmental advantages of using CNG or LNG instead of diesel fuel?

- 20-25 percent reduction in greenhouse gas emissions<sup>4</sup>
- Up to 50 percent reduction in nitrogen oxide emissions<sup>5</sup>
- 70-90 percent reductions in carbon monoxide emissions<sup>5</sup>
- 67-94 percent lower particulate matter emissions<sup>2</sup>
- Significant reductions in emissions of non-methane organic gases<sup>2</sup>

## What are the other advantages of CNG or LNG waste collection and recycling trucks?

- Less noise because they operate at a 80-90 percent lower decibel rate than diesel trucks.<sup>6</sup>
- Drivers and crews prefer them because of smoother operation and less noise.
- Industry use of natural gas vehicles in 2013 offset the use of more than 20 million gallons of diesel fuel.
- Natural gas is primarily produced domestically, leading to less dependence on foreign oil.
- CNG or LNG trucks are as safe as diesel-powered trucks.
- CNG trucks provide the opportunity to fuel 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.<sup>7</sup>



### What are the challenges to using natural gas trucks?

- CNG or LNG trucks are more expensive than diesel-powered trucks due to the different fuel storage and delivery system.
- Truck maintenance facilities must be upgraded.
- A new, costly fueling infrastructure must be sited and built.
- Heavier fuel tanks cause a smaller productive capacity for collection trucks, leading to an increase in the size of the industry fleet.

1 Estimate based on "Vehicle Use and Industry Survey", U.S. Census Bureau, 2002

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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