

Waste Management of Washington, Inc.

Mitigation plan goals and overarching principles

The refuse industry is a perfect industry for emissions-reducing natural gas trucks (i.e., replacement of Class 8 local freight trucks) since they run similar routes in neighborhoods each day and always return to the same spot. Transitioning to a natural gas fleet requires significant capital investment – over \$300,000 per truck and \$1.5 - \$3.0 million per station. This investment results in significant reduction in NO_x, which is what the VW Settlement is intended to specifically remedy, as well as greenhouse gas (GHG) emissions. Natural gas trucks are a proven technology with quantifiable environmental benefits. We have a significant opportunity in Washington to make a real impact in reducing NO_x, as well as the associated “free” GHG emissions reductions, in the state.

Our refuse trucks often operate, for up to 10 hours a day, in urban, highly populated, sensitive areas. These population areas often have the highest emissions of NO_x, GHG, and particulate matter from diesel engines. Furthermore, natural gas vehicles deliver the most cost effective NO_x emissions reductions, dollar for dollar, of all vehicles eligible for VW Settlement Funds. The VW Settlement Funds would allow the state to fund up to 25% of the new vehicle cost for each – ranging from \$75,000 to \$ 100,000 for natural gas trucks – as opposed to 100% funding for a government vehicle. Thus, the VW settlement funding would go 4 times as far by taking advantage of private investment.

While many trucks are, and should be transitioning to natural gas engines for many reasons, including refuse trucks in the mix of trucks eligible for VW Settlement Funds is prudent in Washington to encourage additional investment in the state in natural gas vehicles with the greatest opportunity to reduce NO_x, on a dollars-per-ton basis.

Mitigation fund allocations

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General comments

see attached file

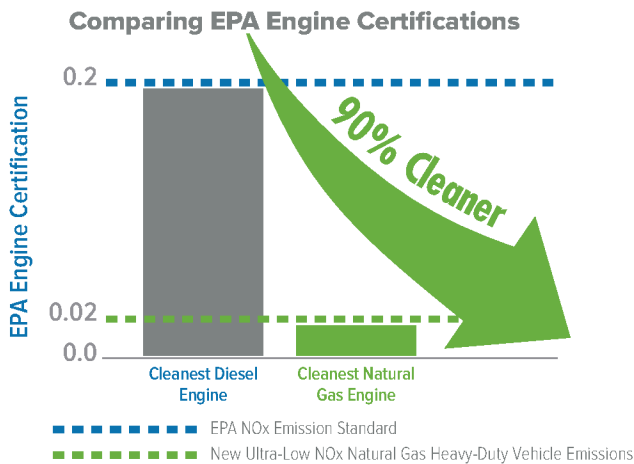
Make a Bold Impact on Air Quality Today

More than 50% of Americans are exposed to unhealthy levels of ozone and particulate pollution, putting them at greater risk for asthma, lung cancer, cardiovascular disease, and premature death. Volkswagen's \$2.9 billion Environmental Mitigation Trust fund provides each state an incredible opportunity to make an immediate and tangible impact on air quality by targeting medium- and heavy-duty vehicles—the leading source of these toxic air contaminants in almost every metropolitan area.

Natural gas vehicles (NGVs) can transform the medium- and heavy-duty transportation sector.

Sustainable:

NGVs Offer the Cleanest Heavy-Duty Truck Engines in the World



Natural gas medium- and heavy-duty engines provide unmatched reductions of smog-forming emissions of nitrogen oxides (NOx). In 2015, a revolutionary natural gas engine was certified by the U.S. Environmental Protection Agency and California Air Resources Board to a level 90% below the EPA's current exhaust standard and 90% below the cleanest diesel engine. A truck with this engine has an emission profile equivalent to that of a heavy-duty battery electric truck.

Available:

NGVs are Commercially Available Today Across All Applications Qualified for Funding

NGVs are commercially available from traditional truck OEMs with established sales and service networks. Retrofit and repower options are also available from a variety of manufacturers.

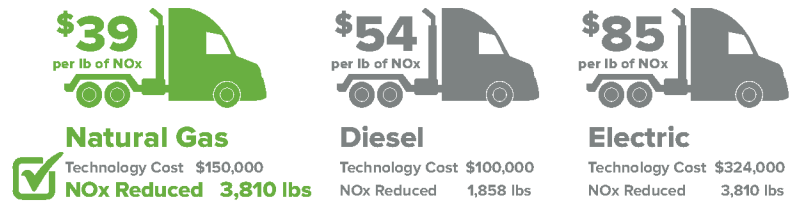
- Applications Include:**
- Heavy Semi Tractor
 - Single Axle Van
 - Cement Mixer
 - Large Walk In Van
 - School Bus
 - City Delivery Truck
 - Motor Coach
 - Shuttle Bus
 - Conventional Van
 - Rack Truck
 - Transit Bus
 - Dump Truck
 - Refrigerated Van
 - Tow Truck
 - Fuel Truck
 - Refuse Truck
 - Utility Truck

Responsible:

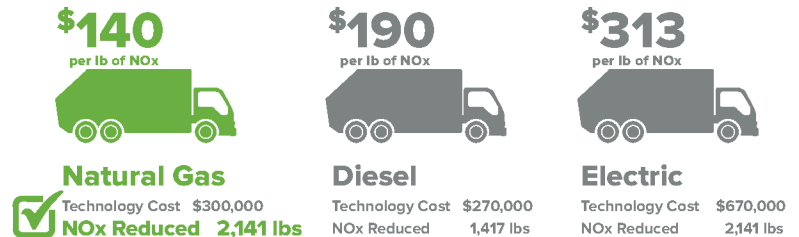
Dollar-for-Dollar, NGVs Deliver the Most Cost-Effective NOx Emissions Reductions

The calculations shown below assume the deployment of the cleanest commercially available model for each application. Funding natural gas vehicles will lead to the largest total reduction in NOx emissions.

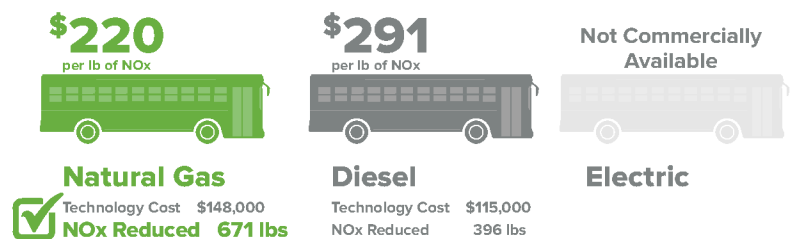
Short/Regional Haul Trucks



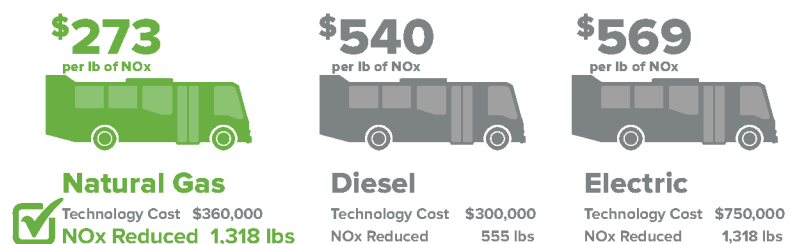
Refuse Trucks



School Buses



Transit Buses

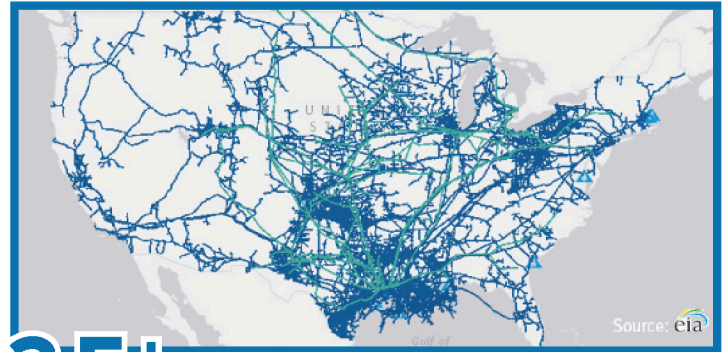


#1

Natural Gas Producer in the World

90+ years supply of recoverable natural gas

Continual supply by harnessing renewable sources



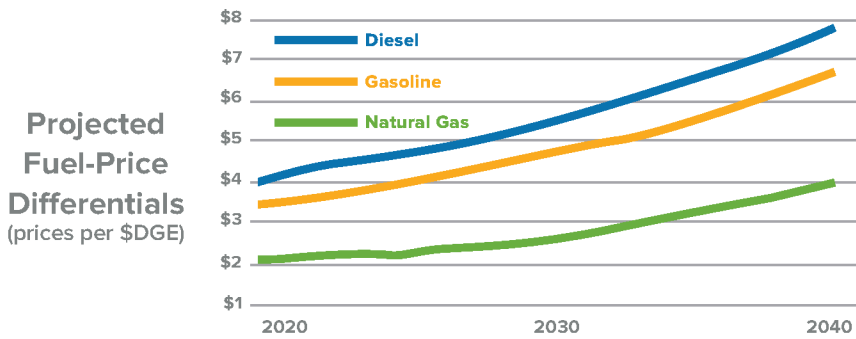
2.5+ million miles of U.S. pipeline infrastructure

The U.S.' expansive natural gas pipeline system is well poised to support a national network of natural gas fueling stations. Nearly 2,000 CNG and LNG fueling stations are operating today, with continual expansion underway.

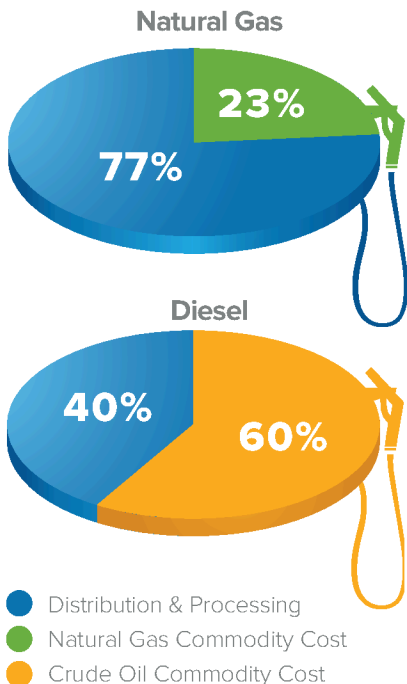
Source: U.S. Energy Information Administration

Natural gas is a clean, low-cost, and domestically abundant transportation fuel.

Natural Gas Provides Long-Term Fuel Price Stability and Cost Savings



Source: U.S. Energy Information Administration



Currently, natural gas prices are \$0.75 to \$1 or more lower than diesel at the pump, with a firm price advantage expected to remain for decades as shown in the chart above.

Beyond the fuel-price differential, the pump price of natural gas remains relatively stable for two reasons. First, it is domestically sourced. Second, the commodity cost of natural gas only makes up 23% of the pump price so price fluctuations have minimal impact.

In contrast, approximately 60% of the price of diesel fuel is impacted by the market cost of crude oil, which is largely sourced from politically unstable, high-conflict regions. When crude oil prices increase, diesel prices follow suit which can lead to significant swings in a fleet's fuel costs.

Natural Gas Reduces WTW Greenhouse Gas Emissions

Compared to Diesel:

- LNG 11% reduction
- CNG 17% reduction
- RNG 115% reduction



Source: NGVAmerica Fleets Run Cleaner on Natural Gas White Paper 2016

Volkswagen EMT Funding Recommendations

- ✓ Fund alternative fuel vehicle projects that cost effectively maximize NOx reductions for both public and private fleets
- ✓ Provide higher funding levels for medium- and heavy-duty engines that deliver NOx reductions greater than current EPA standards
- ✓ Target funding for technologies that have demonstrated lower in-use emissions
- ✓ Prioritize funding for commercially available products and projects that are ready to begin

Natural gas vehicles can fulfill all of these recommendations today!