NGVs Emissions Brief

NGVs Reduce NOx Emissions

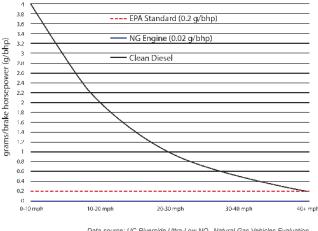
- NGVs produce 99.5% less NOx than their diesel competitor.
- Utilizing new technology diesel engines only meet the "near-zero" standard of 0.2 grams/brake horsepower when traveling at constant speeds above 40 mph. Natural gas engines achieve near-zero consistently, regardless of speed.
- According to the California Air Resources Board, this means that the effective NOx emissions value for the newest technology diesel engine is 20 times more than its natural gas counterpart.
- · Emissions from diesel trucks are more severe as they make regular stops, which are typical of UPS, FedEx, Amazon delivery trucks, waste refuse trucks, public transportation buses and school buses. This leads to higher NOx emissions from diesel in densely populated and larger cities, adding to the already poor air quality.

NGVs for Clean Air and Responsible Emission Reductions

- NGVs are the most efficient way to reduce NOx per dollars basis.
- NGVs provide the largest and most cost-effective reductions in pollutants than any other commercially available power-train options today.
- NGVs still provide more NOx reduction per dollar spent than their electric counterparts. Electric trucks lack horsepower, which limits electric trucks to light loads traveling on flat surfaces. Electric trucks also have limited range.
- NGV engines significantly reduce noise pollution and make for quieter refuse trucks and school buses.

Reduce Fuel Costs with NGVs

- At 2021 prices, natural gas costs \$1.83 per diesel gallon equivalent (DGE), compared to \$3.29 per gallon of diesel.
- Based on the fuel savings alone, NGVs have a much shorter payback period than new technology diesel engines.
- Natural gas is domestically produced and its abundant supply is expected to keep prices low and stable going forward.



Natural Gas

\$150,000

\$300.000

Technology Cost

\$69 per lb.

Natural Gas

\$90 per lb.

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Technology Cost

Technology Cost

NOx Emissions by Speed

Diesel Technology Cost

\$496 of NON

Diesel

\$270,000







\$190 per lb. of NOx

Technology Cost NOx Reduced \$670,000 4,423 lk

\$300.000

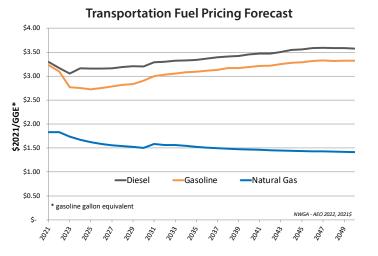
1.583 lb

\$290,000 5.715 lbs

\$1,764 per lb. of NOx

Technology Cost NOx Reduced

Natural Gas Diesel Electric \$125.000 Technology Cost NOx Reduced \$100.000 Technology Cost 57 lbs NOx Reduced



Conclusions

- NGVs technology is ready to go now.
- long-term savings.
- NGVs are the most effective way to reduce NOx and SOx.
- lower long-term maintenance costs compared to diesel
- diesel engines in NOx

Data source: UC Riverside Ultra-Low NO_x Natural Gas Vehicles Evaluation