

Natural Gas Vehicle Incentive Program

Report Prepared for Natural Gas Vehicles for America by Emisstar LLC

Executive Summary

Regional, state and local governments face mounting environmental and public health challenges to address toxic air contaminants and greenhouse gas emissions, especially those emitted by mobile sources such as automobiles, trucks, transit buses and delivery vehicles. On-road, heavy-duty diesel vehicles are significant contributors due to the work-horse like nature of the diesel engine itself, with their impressive durability and duty cycle supporting municipal or commercial operations. Cumulatively, this legacy diesel vehicle population produces staggering criteria pollutant and greenhouse gas emissions. For many communities, fleets of traditional diesel- and conventional gasoline- powered vehicles are a starting point for developing strategies to reduce mobile emissions.

Concerns over emissions, combined with increasing economic and political pressure to reduce US dependence on foreign petroleum, have created opportunities for fleets looking to leverage effective domestically fueled transportation solutions. Balancing environmental, public health, economic and fiscal priorities may require fleets, government regulators, and municipal planning organizations to develop multiple strategies in their approach, including the expanded use of natural gas as a primary transportation fuel.

The purpose of this technical report is to analyze how a regional natural gas vehicle (NGV) incentive program could be developed and effectively implemented to meet the environmental, energy security, and public health challenges impacting communities. This analysis builds upon existing regional models focused on emissions reductions and providing incentives for clean vehicles, including natural gas vehicles. By incorporating the NGV program within an existing program, subsidy and rebate framework adopted by municipal planning or air quality regulators will maximize the potential for the program's success. This report was commissioned by Natural Gas Vehicles for America and authored by Emisstar LLC, an independent consulting practice focused on energy, emissions and sustainable technologies.

The methodology for the report has three main elements. First, key interviews with stakeholder public and private organizations were conducted to understand existing programs, successes and weaknesses, program criteria, as well as funding sources and availability. Second, the authors performed a thorough review of comparable programs nationwide, including the Texas Emissions Reduction Plan and California's Carl Moyer Program. Finally, detailed recommendations were developed including findings from the interviews and relevant research, such as program administration structure, example calculations of emissions and other benefits, and defined program criteria, such as vehicle eligibility and scrapping requirements.

Key recommendations outlined in the report include identifying ideal target vehicle populations that support infrastructure requirements for natural gas fueling station investment while providing the greatest emission and petroleum displacement benefits. The report suggests incorporating specific incentive program eligibility and commitment requirements to ensure that emissions reductions are real, significant and surplus, including:

- Eligible trucks must have been owned and operated in the target region for the past 2 years,
- Eligible trucks will be Class 6 and higher,
- Newer, replacement truck be operated in target region for 7 years,
- At least 75% of mileage driven must be within designated nonattainment area,
- Annual mileage cannot exceed 130% of historical mileage from previous 2 years,
- GPS should be installed and remain operational for 7 years,
- Old truck must be scrapped or permanently removed from state and nonattainment regions, and
- If usage commitments are not met for the new truck, applicant may be required to pay back a prorated amount of the grant.

Several recommendations of the report are specific to natural gas projects. For example, re-consideration of typical scrapping requirements may be necessary for highly specialized fleets such as solid waste fleets that have a fairly high resale values in the used truck market. To promote more vigorous participation with private sector fleet operators; new programs may want to consider allowing participants with these vehicles the option to scrap or to permanently transfer them out of state. When determining potential grant amounts, using fuel consumption rather than annual mileage to more accurately account for vehicle impact. Solid waste fleets, for example, operate almost extensively stop-and-go operation in urban areas, with frequent idling.

Recommendations for incentive grant amounts are based upon actual emissions reductions achieved, focusing on particulate matter (PM) reduction cost effectiveness – a benchmark industry metric. Cost-effectiveness is a commonly used statistic to compare how well a project achieves emissions goals per dollar. It is anticipated that a new NGV incentive program yields average cost effectiveness of between \$273,000 to \$365,000 per ton of PM reduced, which is comparable to other incentive grant programs.

The report provides example calculations to forecast PM reductions achieved by a new NGV incentive program with an initial funding pool of \$10 million. Replacement of approximately 80 to 170 Class 6 through Class 8 diesel trucks with new liquefied or compressed natural gas trucks yields total average PM reductions of 50 to 67 tons over 7 years (7.2 to 9.5 tons per year). Over 175 tons of NOx emissions and 5500 tons of greenhouse gases would be reduced each year through realization of this program. These emissions reductions could assist regions in meeting transportation conformity requirements, as well as other local and regional air quality and energy goals.