NGVAMERICA
Natural Gas Vehicles for America

400 North Capitol St NW Washington, DC 20001
202.824.7366 www.NGVAmerica.org

The Great Discontinuity: Why Historical Studies Are Not a Useful Guide in Making Current and Future Heavy-Duty Vehicle Purchase Decisions

Over the last decade, many studies have compared the emissions and ownership cost of natural gas versus diesel vehicles. Unfortunately, because of significant technology and regulatory changes, none of these studies are very useful to heavy-duty fleet decision-makers in guiding their decisions on current and future vehicle purchases. Among these changes are the:

1) Implementation of 2007 and 2010 U.S. EPA heavy-duty engine emission regulations
2) Implementation of 2006 U.S. EPA diesel fuel sulfur content regulations
3) Enactment of federal financial incentives that are now available for the purchase of heavy-duty natural gas vehicles (NGVs) and for the installation of NGV refueling equipment, and incentives that soon will be available for the purchase and use of natural gas as a vehicle fuel.
4) Significant improvement in reliability and energy efficiency in the current and next generation of heavy-duty natural gas engines that put them on par with diesel engines
5) Increasing gap between the price of petroleum and natural gas at the pump

Among the most significant impacts of these changes and trends to heavy-duty fleet owners/operators are the following:

Engine emissions:

A. **NOx:** Natural gas engines produce less nitrogen oxides (NOx) than diesel engines. Beginning with 2007 engines, new natural gas engines will produce only one-sixth the NOx of new diesel engines. Even when the 2010 engine emissions standards go into effect, natural gas engines are expected to continue to have a NOx reduction advantage.
B. **Greenhouse Gases:** On a well-to-wheels basis, natural gas engines produce less greenhouse gases than diesel engines, and that gap will continue to grow.

Cost:

a) **Vehicle Cost:** The federal NGV purchase incentive will reduce the cost of a new heavy-duty NGV by up to $32,000. Meanwhile, 2007-compliant diesel vehicles will cost $10,000+ more than comparable 2006 vehicles. In many cases, this eliminates the NGV purchase premium.
b) **Fuel Cost:** The gap between the cost of natural gas and diesel at the pump is substantial, and could increase further – especially when ultra-low sulfur diesel is required. In addition, beginning October, 2006, the federal government will provide compressed and liquefied natural gas sellers a 50 cents-per-gallon motor fuels excise tax credit.
c) **O&M Cost:** The operating and maintenance cost of new 2007-complaint diesel vehicles will increase significantly because of a loss of efficiency. This is the result of complex new emission control technologies that will increase fuel consumption, degrade performance and require more frequent and expensive maintenance. New natural gas engines, on the other hand, have already demonstrated they can meet 2010 emission standards with existing proven technology, and will experience increases in efficiency and fuel economy.

Because of these factors, during the 2006-2010 period, the emission advantages of heavy-duty natural gas engines will continue, while the life-cycle costs of diesel vehicles will begin to exceed the costs of NGVs. Therefore, studies that compare emissions and ownership cost of even relatively new (e.g., 2005) heavy-duty vehicles are not useful to fleet managers in making current and future vehicle purchase decisions.