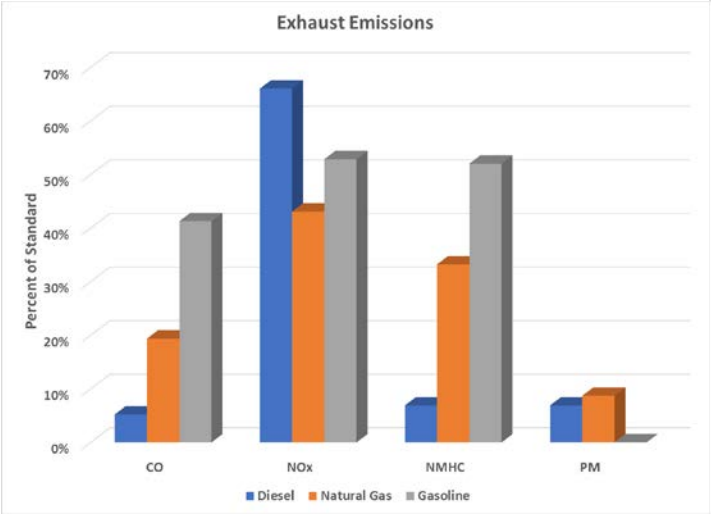
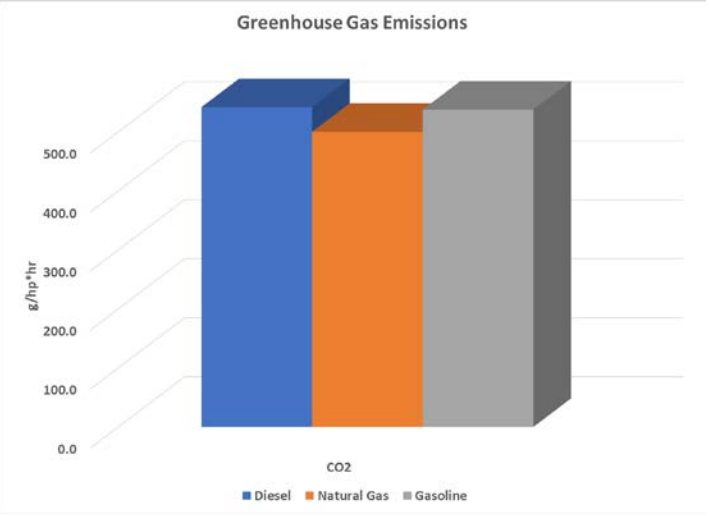
Vehicular Fossil Fuels Comparison

A comparative overview of the use of vehicles fueled by gasoline, diesel fuel and natural gas.

	Gasoline	Diesel	Natural Gas (NG)
Emissions	Must meet same standards. Actual emissions vary by model. See graph.	Must meet same standards. Actual emissions vary by model. See graph.	Must meet same standards. Actual emissions vary by model. See graph.
Vehicle weight	Unaffected	Unaffected	May be heavier because of CNG tanks thus lower fuel economy
Vehicle range	Unaffected	Unaffected	May have reduced range due to lower energy content of natural gas
Gross emitter potential	Higher emissions than NG when burned in an engine with emission controls that have failed	Higher emissions than NG when burned in an engine with emission controls that have failed	Lower emissions than diesel **and** gasoline **when burned in an engine with emission controls that have failed**
Maintenance facility requirements	No modifications to existing garages required	No modifications to existing garages required	Increased OSHA compliance requirements because of the explosive nature of vented NG
Maintenance	Standard maintenance	Standard maintenance	Potentially reduced long-term engine maintenance
Initial vehicle cost	No impact	No impact	Additional $10,000 to $30,000 per vehicle
Fuel Cost (per gallon or equivalent) *	$2.49	$2.76	$2.17
Fuel cost stability	Subject to market volatility	Subject to market volatility	More stable since CNG is not traded as a commodity
Motor fuel tax	Taxed as a motor fuel	Taxed as a motor fuel	Not taxed as a motor fuel
Refueling	Readily available	Readily available	Stations are limited and vehicles take longer to refuel
Availability	Many engines/vehicles to choose from	Many engines/vehicles to choose from	Limited models of engines/vehicles available
***Fuel prices current as of October 2017**			

Average Heavy Duty Engine Emission Certification Values





Prepared by NJDEP, Bureau of Mobile Sources, January 2018. Engine certification values are an average based on data from the US Environmental Protection Agency for engines certified for 2017.

Emissions

- **ALL NEW ENGINES MUST MEET THE SAME EMISSIONS STANDARDS**, and are much cleaner overall compared to earlier engines. Therefore, purchase of new engines should be encouraged.
- New natural gas-powered engines have emission levels comparable to new diesel and gasoline engines. The emission benefits from replacing an old vehicle with a new natural gas, diesel, or gasoline vehicle are essentially equivalent because all new vehicles must comply with the same federal standards.
- Natural gas, diesel, and gasoline fuel are not "inherently clean" enough to meet the newest engine emission standards, designed to reduce NOx, unless exhaust emissions aftertreatment systems are employed.
- An uncontrolled heavy duty engine may emit 5 to 80 times the amount of pollution above the new engine emission standards.
- If natural gas was burned in an engine without any emissions controls, it would not meet today's emission standards. Compared to diesel or gasoline fuel burned in that same engine, the natural gas engine would likely have lower emissions. However, to comply with USEPA emission standards, exhaust emissions aftertreatment such as catalytic converters, computer-controlled combustion management and exhaust gas recirculation must be employed on all engines, regardless of fuel type. Diesel engines also employ particulate filters and selective catalytic reduction systems to meet the standards.
- Particulate emissions from diesel engines tend to increase as the engine ages, whereas that is not typically the case with natural gas engines. An old natural gas engine may be slightly lower emitting than a similarly aged diesel engine. However, both types of engines must stay within the same emission limit.

Price

- Most of the time natural gas can be cheaper than conventional gasoline and diesel fuel, and the price is more stable. While the fuel price is lower for a CNG vehicle, they also get fewer miles per tank compared to a gasoline or diesel vehicle, which means more frequent refueling trips.
- Gasoline and diesel prices are subject to volatility due to being traded as a commodity.
- Prices for a CNG vehicle can be $10,000 to $30,000 more than for a gasoline or diesel vehicle.

Availability

- There are limited models of natural gas vehicles to choose from compared to the multitude of models of gasoline and diesel vehicles.
- The pipeline infrastructure for natural gas is well-established, but the refueling stations are far less abundant than gasoline and diesel stations.
- Refueling for natural gas vehicles takes longer. They can take a significant time if the pressure is low, potentially taking the entire night.