

A Greener Future For The Garden State?

The Role of Natural Gas Vehicles

All New Jerseyans have a stake in decisions made today about your State's transportation/energy future! Will it be a healthy one for your families and children? Will it give your communities the greatest energy security? As millions of your tax dollars are spent, will they be invested most productively?

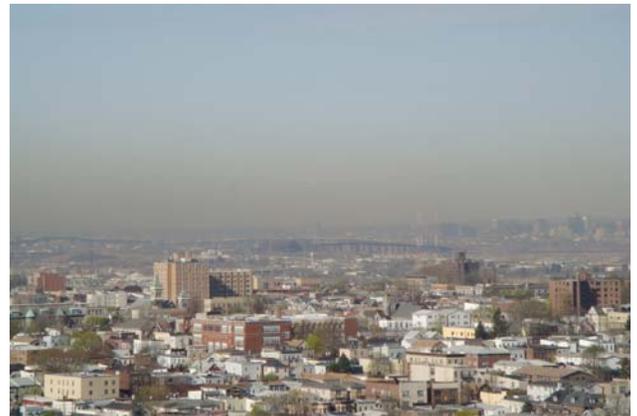
Many decisions will determine the State's course – from mass transit and land use planning to electric car and smart grid development to bicycle lanes. This factsheet addresses one of the most significant areas: what to do about the diesel bus and truck fleets operating in your communities – the heaviest polluters and fuel users in the State. It describes the issues, the choices and how you – as a citizen, government or business official, solid waste industry executive or student - can be part of the solution!

NEW JERSEY QUICK FACTS

Population	8,682,661
2.8% of total U.S.	
Average people per sq. mile	1,134.5
Densest in US- Av. Total 79.6 ⁱ	
Total autos*	3,784,092
Total trucks	2,396,600
Registered in NJ	
Total buses*	23,287
Registered in NJ ⁱⁱ	
Total vehicles registered	6,246,882

*Includes Federal, State, county, municipal as well as private and commercial vehicles.

Note: The heavy duty vehicles are a small fraction of the total trucks and buses, probably under 115,000.



Smog over Newark, NJ

TRANSPORTATION POLLUTION: A CHALLENGE THAT NEEDS TO BE ADDRESSED

New Jersey's 6,203,979 vehicles are a major source of the State's health-threatening air pollution. Though all of these vehicles pose environmental and health risks, trucks and buses that run on diesel fuel are of greatest concern.

Diesel bus and truck fleets are the backbone of NJ's economy. Truck fleets deliver products and collect wastes and recyclables. Buses transport people around town and to airports. New Jersey had 18,000 school buses transporting over 800,000 school children in 2009ⁱⁱⁱ. These services are indispensable to the functioning of every community. Yet, their emissions exact a significant health toll - especially from soot particles, toxic chemicals and nitrogen oxides that are released when diesel fuel is burned.

The 4,000 to 6,000 refuse and recycling trucks pose exceptional risks since they travel down every residential street, stopping and starting, compacting their loads and releasing their pollutants at every doorstep.

In urban areas, the NJ Department of Environmental Protection (DEP) calculated that airborne soot and toxins from diesel contribute up to 70% of cancer risk.

Registered in-state vehicles are not the only concern. The tens of thousands of commuters and long distance "18 wheelers" traveling through NJ on Interstate I-95 and other major highways contribute to the pollution burden. Nearly 500,000 New Jerseyans live just a football field's length away from major highways with their dense soot concentrations^{iv}.

THE HEAVY TOLL AND COST OF ASTHMA

Number of NJ children with asthma	218,914
(10% of NJ children)	
Number of NJ adults with asthma	516,008
(8% of NJ adults) ^v	
1998 medical cost of asthma in NJ	\$324 million ^{vi}

A key impact of soot particles is on respiratory health. They are clearly linked to asthma attacks, exasperating the health of those who already have the illness as well as those with allergies^{vii}. According to the State's Asthma Strategic Plan, low income and minority groups have higher rates of asthma, with black residents being three times as likely as white residents to be hospitalized for asthma in 2006^{viii}.

NJ truckers and dockworkers are also inordinately affected by diesel emissions. A 2007 report by Harvard and UC Berkeley found that those who operated or worked with diesel engines had a higher rate of premature death and disease than those

who did not and that truckers were 50% more likely to die prematurely of heart disease than the general population^{ix}.

In 2008, the same researchers studied 31,135 truckers' records. They found that those who did short-haul pickups and deliveries were at the highest risk for lung disease. Of those in the study, there were 779 cases of lung cancer, and 734 deaths found that stemmed from lung cancer^x.

A 2008 Netherlands study has found that diesel fumes can actually change brain activity. Ten subjects, exposed to diesel fumes for just an hour, showed a clear stress response. Their change in brain function occurred only thirty minutes into the study. The researchers attribute this impact to the amount of soot particles in diesel fumes^{xi}.

NEW JERSEY'S AIR QUALITY RECORD

In NJ overall, The US Environmental Protection Agency (EPA) found 13 of its 21 counties in violation of the soot standard in 2004 and found every county in violation of the ground-level ozone standard^{xii}. The American Lung Association's 2009 State of the Air report, covering data from 2005-2007, found some decline in these levels.

STATE OF THE AIR REPORT 2009			
Five of 18 Counties Monitored* For Particle Air Pollution Rated "F" and 12 of 17 Counties Monitored** For High Ozone Days Rated "F"			
Particle Air Pollution	High Ozone Days		
<i>County</i>	<i>County</i>	<i>Population</i>	
Bergen 894,840	Atlantic	270,681	
Camden 517,234	Camden	517,234	
Essex 770,675	Cumberland	156,830	
Hudson 595,419	Gloucester	287,860	
Union 523,249	Hudson	595,419	
	Hunterdon	129,031	
	Mercer	364,883	
	Middlesex	789,102	
	Monmouth	642,448	
	Morris	487,548	
	Ocean	569,111	
	Passaic	490,948 ^{xiii}	
Total Risk: 3,301,417 (38%)	Total Risk: 5,301,095 (61%)		

*Counties not included: Cumberland, Hunterdon, and Monmouth
 **Counties not included: Bergen, Essex, Union, and Warren^{xiv}
 Note: The reason numerous counties were excluded from State of the Air Report is due to incomplete monitoring data for all 3 years that monitoring has occurred, or the county did not collect monitoring data.

Camden has the worst record with "F" for particle and ozone pollution plus one of the highest hospital discharge rates for asthma in the State in 2006^{xv}.

DIESEL FLEETS: MAJOR CONTRIBUTORS TO CLIMATE CHANGE AND OIL DEPENDENCY

Diesel fleets contribute significantly to New Jersey's greenhouse gas emissions. Total vehicle emissions accounted

for 38% of the Carbon Dioxide emitted in NJ in 2007^{xvi}. Diesel emissions contain 2,778 grams of carbon content per gallon of fuel burned- much higher than the 2,421 grams in gasoline emissions per gallon according to the EPA's fuel economy measurements.^{xvii}

Reliance by NJ as by other states on petroleum-based fuels for essential fleet operations is increasingly risky.

Nationwide, in 2008 the US relied on imported oil to meet 57% of its needs. A third comes from undependable sources: 21% from Saudi Arabia and other AOPEC countries, 7.1% Venezuela and 9.9% Nigeria. The US consumed 19,498,000 barrels of oil per day while only producing 4,950,000 barrels per day^{xviii}. The bombing of a Middle Eastern pipeline or oil embargo could paralyze the US economy. But, short of such crises, the volatile price shifts of fuel, controlled by foreign suppliers, shake municipal budgets. NJ, with just 2.8% of the US population, had the 8th highest levels of expenditures for petroleum (\$23 billion) in 2007^{xix}. In addition, global competition for access to the world's most rapidly dwindling fossil fuel is growing, especially from China, India and other parts of industrializing Asia.

HEALTHIER AIR & ENERGY SECURITY: THE PROMISE OF SHIFTING BUS AND TRUCK FLEETS TO NATURAL GAS

Government officials, industry leaders and citizens in NJ increasingly recognize the multiple problems caused by the diesel vehicle sector. But what are the solutions?

Because of the strict 2007 and 2010 standards for particulate and nitrogen oxide emissions from heavy duty fleets set by the US EPA, new diesel trucks and buses are much cleaner than ever before. And older (legacy) diesel fleets can get funding through the NJ DEP for equipment reducing their emissions and may use biodiesel fuel, cutting down their petroleum use.

However, for municipalities wanting the healthiest air, freedom from foreign oil, and the best economic investment going forward, the best option is a shift to natural gas fuel.

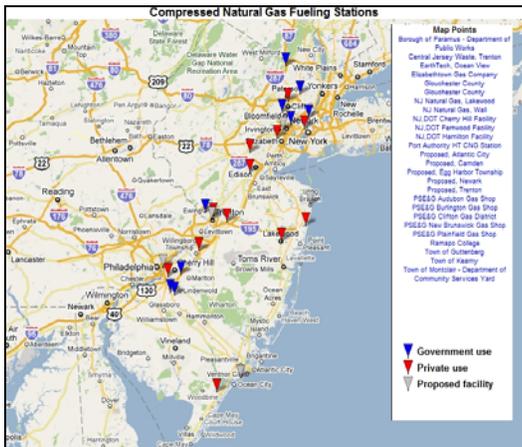
More than 11 million natural gas vehicles travel the roads worldwide, but only about 130,000 are in the US. The move to natural gas trucks and buses began on the West Coast eight years ago and has spread steadily eastward to New York in 2007. New Jersey got on board in 2009 for many good reasons:

- ✓ Natural gas is a domestic secure fuel. 97% of the natural gas consumed in the US is from No. America. And our supplies are forecast to last 118 years^{xx}.
- ✓ It is the cleanest fuel available and is 80% hydrogen by atoms per molecule, so it tends to still burn "clean" as trucks age^{xxi}.

- ✓ Natural gas vehicles generate 20 to 30% fewer greenhouse gas emissions compared to diesel.
- ✓ Natural gas vehicles are fully commercial choices and operate both cleanly and quietly! More than 16,000 CNG trucks and buses travel US roads today^{xxii}.
- ✓ Natural gas vehicles are also the best investment. While their purchase cost is higher, federal tax credits make the fuel itself \$1 to \$1.50 cheaper per gallon than diesel, giving a CNG refuse truck \$10,000 or more in annual fuel cost savings. Federal incentives also cover up to 30% (max: \$30,000) of the costs of new refueling stations.
- ✓ Producing this domestic fuel, the vehicles that use it and the refueling stations and maintenance services for them creates new “green” jobs.

STEPS FORWARD FOR THE GARDEN STATE

Up to 2009, there was a small number of NJ Transit buses and utility vehicles plus two truck fleets used CNG, and there were just 23 CNG refueling stations - none publicly accessible.



Map of Natural Gas Filling Stations in NJ

In 2009, EarthTech Contracting purchased the first CNG refuse fleet for Ocean View, New Jersey^{xxiii}. Then, Central Jersey Waste (CJW) won the contract for hauling Hamilton Township’s waste, which required use of natural gas trucks. Clean Energy, a California-based company and major provider of natural gas for transportation, opened a station for CJW in the fall of 2009 (able to fuel 30 trucks)^{xxiv}. Following these leads, Camden, Atlantic Cy, Atlantic City and 3 waste haulers (Waste Management, Blue Diamond and Suburban Disposal) got in on the act, ushering in a new age of natural gas for NJ.

\$14.9 million in stimulus funding by the Obama Administration jumpstarted fleet conversions and infrastructure expansion in the State^{xxv}. Largely with these funds, leveraging \$38.7 million from private sector investment, NJ will soon have 286 CNG trucks and buses on its roadways, and 5 new refueling stations. This will displace 1,891,900 gallons of diesel fuel per year.

286 CNG Refuse Trucks and Buses and 5 Refueling Stations, Supported Largely by Federal Stimulus Funds

Initiative	CNG Vehicles	Diesel Fuel Displaced/	New CNG stations
Hamilton Township, CJW	42 trucks	499,200 gals	1
Blue Diamond Mt. Arlington	10 trucks	52,000 gals	
Waste Management Newark	10 trucks	52,000 gals	1
Suburban Disposal	2 trucks	26,000 gals	
Atlantic County Utilities Authority	15 trucks	137,700 gals	1
Atlantic City Jitney	190 buses	969,000 gals	1
Camden, Waste Management	17 trucks	156,000 gals	1
TOTAL	286	1,891,900 gals	5

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SO WHAT’S NEXT FOR NEW JERSEY?

Much has been done to improve New Jersey’s air quality, but the chance to embrace natural gas for fleets brings energy security, environmental, and economic gains for the State.

In addition, perhaps the greatest long-term benefit is the role that natural gas use plays as a stepping-stone toward use of another even better gas fuel, called “biomethane.” It is, in fact, natural gas (CH₄), but a renewable form (so it is often called “RNG”) that is obtained not by drilling but by using the biogases generated wherever organic wastes break down: in landfills, sewage treatment plants and in dairy or agricultural operations.

Collecting and refining these gases can turn NJ’s expensive garbage problem into a renewable fuel solution! It is also a carbon-free solution, since making RNG captures more methane (a powerful greenhouse gas) than the vehicles using it create. RNG is being widely used in Europe already in vehicles, and as production in the US grows, fleets using traditional natural gas today can blend the fuels or make a full “seamless” transition to this first truly sustainable fuel^{xxvi}.



CNG storage bottles at the refueling station built and operated by Clean Energy for Central Jersey Waste’s refuse trucks

How public leadership can help: The State's Diesel Retrofit Law of 2005 has ensured progress in cutting diesel pollution by installing particle filters on older fleets. And the EPA's 2010 standards require new diesel trucks to use more sophisticated technologies that are more complex and expensive^{xxvii}.

While the State's new Global Warming Response Act has recognized the primary role transportation plays in generating greenhouse gases (38%), it focuses mainly on automobiles, even though electric vehicle and smart grid systems may take years to work out. The Act gives little emphasis to heavy-duty fleets, **where the greatest assured near term gains can be made**^{xxviii}.



One of the new CJW trucks serving Hamilton, NJ

Since the new Administration has made the use of natural gas in fleets, for the first time, a significant priority in NJ., this leadership can mean a great deal in promoting change if the State now seeks to take maximum advantage of existing federal tax incentives (see page 3)^{xxix} and also supports the extension and expansion of these tax incentives this year.

Municipal leaders may play a vital role. When their waste contracts come up for renewal, they can simply make the use of the cleanest fuel available a criterion for bidders as some communities are doing. Solid waste companies, to better serve their customers and protect the health of their communities, can also be leaders, making this shift voluntarily. Their green fuel use may attract more customers!

Every New Jerseyan, in fact, can have an important voice. You may tell your state and federal legislators that you support the expansion of federal tax credits this year and let your community leaders know that you'd like to have cleaner air by seeing cleaner natural gas refuse fleets – perhaps also CNG transit and school buses – on your streets. Having a refueling station nearby with public access would allow citizens to choose a natural gas car of their own, like the Honda Civic GX which is now a commercial choice! You can encourage the State to create a grant program covering part of the higher costs for CNG vehicles as an added incentive.

You can distribute this fact sheet to your friends and colleagues and advocate for change in your community!



Proud sons of CJW Vice President Michael Fiumefreddo at the launching of its new CNG fleet

For municipalities and citizens to learn more about the environmental, health and economic benefits of a shift to natural gas fleets and how to explore a local initiative, sources of information include:

New Jersey Clean Cities Coalition
 1 Bank Street, Suite 202, PO Box 223, Rockaway, NJ 07866
 (973) 886-1655
 Attn: Chuck Feinberg chuck.feinberg@gmail.com

Energy Vision
 138th East 13th Street, New York, NY 10003
 (212) 228-0225
 Attn: Joanna Underwood underwood@energy-vision.org

New Jersey Department of Environmental Protection
 P. O. Box 402, Trenton, NJ 08625-0402
www.stophesoot.org
 (609) 292-1122
 Attn: Melinda Dower Melinda.dower@dep.state.nj.us

American Lung Association in New Jersey
 1031 Route 22 West Suite 203, Bridgewater, NJ 08807
 (908) 685-8040
 Attn: Marianne Dalessio mdalessio@lunginfo.org

Natural Gas Vehicles for America
 400 N. Capitol St. NW, Washington, DC 20001
 (202) 824-7366
 Attn: Richard Kolodziej Kolodziej@ngvamerica.org

This fact sheet was prepared by Energy Vision, a New York based national non-profit energy organization, in collaboration with the New Jersey Clean Cities Coalition. Research was conducted by EV intern Neal Day from Drew University.



ⁱ "New Jersey QuickFacts from the US Census Bureau." State and County QuickFacts. Web. 24 Feb. 2010. <http://quickfacts.census.gov/qfd/states/34000.html>.

ⁱⁱ "Table MV-1 - Highway Statistics 2008 - FHWA." Federal Highway Administration: Home. Web. 05 Mar. 2010. <http://www.fhwa.dot.gov/policyinformation/statistics/2008/mv1.cfm>.

ⁱⁱⁱ "NJDEP New Jersey Department of Environmental Protection." The Official Web Site for The State of New Jersey. Web. 31 Mar. 2010. <http://www.nj.gov/dep/dsr/schoolbus/>.

^{iv} "NJ DEP - Diesel Idling Information on www.StopTheSoot.org." NJDEP - StoptheSoot.org. Web. 24 Feb. 2010. <http://www.stopthesoot.org/dieselhealthconcerns.htm>.

^v "New Jersey." State of the Air: 2009 Report -- American Lung Association. Web. 24 Feb. 2010. <http://www.stateoftheair.org/2009/states/new-jersey/>.

^{vi} "Asthma Strategic Plan for New Jersey." Web. 02 Mar. 2010. http://www.state.nj.us/health/fhs/asthma/documents/asthma_strategic_plan2008-2013.pdf.

^{vii} "Diesel and Asthma." Respiratory Health Association of Metropolitan Chicago. Web. 24 Feb. 2010. http://www.lungchicago.org/site/epage/31325_487.htm.

^{viii} "Asthma Strategic Plan for New Jersey." Web. 02 Mar. 2010. http://www.state.nj.us/health/fhs/asthma/documents/asthma_strategic_plan2008-2013.pdf.

^{ix} "Trucker Heart Disease Study and Diesel Particulate Air Pollution." Green Jobs, Green Careers, and Green Business Solutions for Sustainable Communities. Web. 05 Mar. 2010. <http://www.californiagreensolutions.com/cgi-bin/gt/tpl.h.content=1837>.

^x "Diesel truckers at cancer risk from exhaust - SFGate." Featured Articles from SFGate. Web. 24 Feb. 2010. http://articles.sfgate.com/2008-12-09/news/17131567_1_lung-cancer-diesel-exhaust-higher-lung.

^{xi} "Inhaling Diesel Fumes." Medindia - Medical/Health Website. Web. 02 Mar. 2010. <http://www.medindia.net/news/Inhaling-Diesel-Fumeschanges-Brain-Function--34033-2.htm>.

^{xii} "EPA: Clean Air Interstate Rule - New Jersey." U.S. Environmental Protection Agency. Web. 05 Mar. 2010. <http://www.epa.gov/CAIR/nj.html>.

^{xiii} "New Jersey QuickFacts from the US Census Bureau." State and County QuickFacts. Web. 24 Feb. 2010. <http://quickfacts.census.gov/qfd/states/34000.html>.

^{xiv} "New Jersey." State of the Air: 2009 Report -- American Lung Association. Web. 24 Feb. 2010. <http://www.stateoftheair.org/2009/states/new-jersey/>.

^{xv} "Asthma Strategic Plan for New Jersey." Web. 02 Mar. 2010. http://www.state.nj.us/health/fhs/asthma/documents/asthma_strategic_plan2008-2013.pdf.

^{xvi} www.nj.gov/dep/oce/awma-232010v3.pdf.

^{xvii} "Emission Facts: Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel | US EPA." U.S. Environmental Protection Agency. Web. 17 Mar. 2010. <http://www.epa.gov/oms/climate/420f05001.htm>.

^{xviii} "Oil: Crude and Petroleum Products - Energy Explained, Your Guide To Understanding Energy." Web. 02 Mar. 2010. http://tonto.eia.doe.gov/energyexplained/index.cfm?page=oil_home#tab2.

^{xix} "EIA - State Energy Data System." Energy Information Administration - EIA - Official Energy Statistics from the U.S. Government. Web. 26 Mar. 2010. <http://www.eia.doe.gov/emeu/states/seds.html>.

^{xx} "NGVA." Web. 05 Mar. 2010. <http://www.ngvc.org/incentives/09Stinulusfunding.html>.

^{xxi} "NaturalGas.org." Web. 02 Mar. 2010. <http://www.naturalgas.org/environment/naturalgas.asp#emission>.

^{xxii} "NGVA." Web. 08 Mar. 2010. <http://www.ngvc.org/>.

^{xxiii} "EarthTech introduces first environmental refuse fleet in New Jersey | Shore News Today." Shore News Today : NJ Shore Gazette and Current Newspapers. Web. 24 Feb. 2010. <http://www.shorenwstoday.com/news.php?id=2412>.

^{xxiv} "Waste Hauler Goes Green with Natural Gas Fuel Center - NJ.com." New Jersey Local News, Breaking News, Sports & Weather - NJ.com. Web. 02 Mar. 2010. <http://www.nj.com/news/times/regional/index.ssf?base/news-18/1257921946247400.xml&coll=5>.

^{xxv} "NGVA." Web. 05 Mar. 2010. <http://www.ngvc.org/incentives/09Stinulusfunding.html>.

^{xxvi} "Alternative Fuels and Advanced Vehicles Data Center: What Is Biogas?" EERE: Alternative Fuels and Advanced Vehicles Data Center Program Home Page. Web. 30 Mar. 2010. http://www.afdc.energy.gov/afdc/fuels/emerging_biogas_what_is.html.

^{xxvii} "NJDEP - StopTheSoot.org." NJDEP - StoptheSoot.org. Web. 02 Mar. 2010. <http://www.stopthesoot.org/sts-facts.htm>.

^{xxviii} "NJ Global Warming | What is NJ doing about climate change." The Official Web Site for The State of New Jersey. Web. 24 Feb. 2010. <http://www.state.nj.us/globalwarming/initiatives/>.

^{xxix} "H.R. 1835: New Alternative Transportation to Give Americans Solutions Act of 2009 (GovTrack.us)." GovTrack.us: Tracking the U.S. Congress. Web. 31 Mar. 2010. <http://www.govtrack.us/congress/bill.xpd?bill=h111-1835>.