A Greener Transportation Future for the Empire State?
by Energy Vision

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

Many decisions will determine the State's transportation course – decisions ranging from mass transit and land use planning, to electric vehicle and smart grid development, and to bicycle lanes. These decisions will also significantly impact the State's environmental future, since vehicles are the dominant source of climate-changing greenhouse gas emissions and of health-threatening air pollution.

This fact sheet summarizes the challenges posed by continued reliance on petroleum-based fuel, especially by the 2.5 million largely-diesel powered trucks and buses that are the greatest fuel consumers and air polluters. It discusses the one way to make rapid progress today away from oil: converting these fleets to a clean renewable bio-based gas fuel made from the State's organic wastes. Fleets converting to fossil natural gas can achieve cleaner air and greenhouse gas reductions and are poised for a transition to this better gas. (see p. 5)

**VEHICLE POLLUTION: A KEY CHALLENGE**

Although New York State was an early national leader in promoting alternative fuel vehicles (AFVs), the 31,325 AFVs on the road as of 2009 make up only 0.3% of the total vehicles in the State. Long Island is a leading region in this movement.

<table>
<thead>
<tr>
<th>VEHICLES IN NYS QUICK FACTS (2009)</th>
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<tbody>
<tr>
<td>Total automobiles</td>
</tr>
<tr>
<td>Total trucks</td>
</tr>
<tr>
<td>Total buses</td>
</tr>
<tr>
<td><strong>Total vehicles 1</strong>*</td>
</tr>
<tr>
<td>*registered in NYS. Includes federal, state, county, municipal, private and commercial vehicles, not including military vehicles</td>
</tr>
<tr>
<td><strong>Total AFVs</strong> 2</td>
</tr>
<tr>
<td>Compressed Natural Gas</td>
</tr>
<tr>
<td>Electric</td>
</tr>
<tr>
<td>Ethanol, 85% (E85)</td>
</tr>
<tr>
<td>Liquefied Petroleum Gas (LPG)</td>
</tr>
</tbody>
</table>

New York's 11,245,208 vehicles are a major source of the State's health-threatening air pollution. Though all vehicles pose environmental and health risks, diesel-run trucks and buses are of greatest concern – both those registered in-state and the "18- wheelers" and other long distance trucks traveling through NYS on Interstate I-95, the New York State Thruway, and other major highways. All contribute to the State's pollution burden.

Diesel emissions have been classified as a known carcinogen. Exhaust from most pre-2007 diesel-fueled trucks, buses and other heavy-duty vehicles may contain as many as 40 toxic substances, including carcinogens (such as acetaldehyde and benzene) and reproductive toxins. A key impact of soot particles is on respiratory health: they are clearly linked to asthma attacks, and they exacerbate the health of those who already have pulmonary illnesses and allergies.

**THE HEALTH RISKS OF AIR POLLUTION**

<table>
<thead>
<tr>
<th>Total Population of NYS</th>
<th>19,465,197</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population at Risk of:</td>
<td></td>
</tr>
<tr>
<td>Pediatric Asthma</td>
<td>397,702</td>
</tr>
<tr>
<td>Adult Asthma</td>
<td>1,347,988</td>
</tr>
<tr>
<td>Chronic Bronchitis</td>
<td>588,414</td>
</tr>
<tr>
<td>Emphysema</td>
<td>257,899</td>
</tr>
</tbody>
</table>

Some key facts:

- While NYS meets the annual and 24-hour federal Air Quality Standards for particulates (2.5 microns in size), and is requesting a re-designation to achieve attainment status of the state’s population live in non-attainment areas for ozone pollution (2012), with levels ranging from moderate to severe.
- 1 in 8 adults in NYC have been diagnosed with asthma at one point in their lives—a rate 30% higher than the national average.
• Asthma is the leading cause of hospitalizations of children in NYC.⁶

NYS truckers and dockworkers are 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 and that truckers were 50% more likely to die prematurely of heart disease than the general population.⁷

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 4,306 deaths; 734 resulted from lung cancer. 40 other workers also had lung cancer.⁸

NEW YORK STATE’S AIR QUALITY RECORD

<table>
<thead>
<tr>
<th>County</th>
<th>Grade (2011)</th>
<th>Grade (2012)</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronx</td>
<td>F</td>
<td>D</td>
<td>1,397,287</td>
</tr>
<tr>
<td>Chautauqua</td>
<td>F</td>
<td>F</td>
<td>133,503</td>
</tr>
<tr>
<td>Dutchess</td>
<td>F</td>
<td>D</td>
<td>293,562</td>
</tr>
<tr>
<td>Erie</td>
<td>F</td>
<td>C</td>
<td>909,247</td>
</tr>
<tr>
<td>Essex</td>
<td>F</td>
<td>D</td>
<td>37,686</td>
</tr>
<tr>
<td>Jefferson</td>
<td>F</td>
<td>F</td>
<td>118,719</td>
</tr>
<tr>
<td>Monroe</td>
<td>F</td>
<td>C</td>
<td>733,703</td>
</tr>
<tr>
<td>New York</td>
<td>F</td>
<td>D</td>
<td>1,629,054</td>
</tr>
<tr>
<td>Niagara</td>
<td>F</td>
<td>C</td>
<td>214,557</td>
</tr>
<tr>
<td>Orange</td>
<td>F</td>
<td>D</td>
<td>383,532</td>
</tr>
<tr>
<td>Putnam</td>
<td>F</td>
<td>F</td>
<td>99,265</td>
</tr>
<tr>
<td>Rensselaer</td>
<td>F</td>
<td>C</td>
<td>155,541</td>
</tr>
<tr>
<td>Richmond</td>
<td>F</td>
<td>F</td>
<td>491,730</td>
</tr>
<tr>
<td>Saratoga</td>
<td>F</td>
<td>D</td>
<td>220,069</td>
</tr>
<tr>
<td>Suffolk</td>
<td>F</td>
<td>F</td>
<td>1,518,475</td>
</tr>
<tr>
<td>Westchester</td>
<td>F</td>
<td>F</td>
<td>955,962</td>
</tr>
</tbody>
</table>

Total Population at Risk 9,291,892

*Counties not included: Kings, Nassau, Rockland, St. Lawrence, due to incomplete monitoring or the county did not collect monitoring data.

The American Lung Association’s 2012 State of the Air Report⁹ found a marked improvement in ground level ozone emissions with just six counties given an "F" grade compared with 16 the previous year.

DIESEL FleETS: MAjOR CONTRIBuTORS TO CLIMATE CHANGE AND Oil DEPENDENCE

In NYS, the transportation sector generates the largest share (41%) of carbon dioxide emissions, a major climate-changing greenhouse gas, as seen in Figure 1.¹⁰ However, the use of petroleum products for vehicles continues to rise, as does the associated carbon dioxide emissions, as seen in Figure 2.

Reliance by NYS on petroleum-based fuels for essential fleet operations is increasingly risky.

As of 2007, New York was importing 91% of the 193 million barrels of oil consumed—more than any other state. 77% of the oil consumed was used for transportation, at a cost of approximately $33 million a day.¹¹ Of the top 5 countries from which NYS imports its oil—Canada, Mexico, Saudi Arabia, Nigeria and Venezuela, several are politically unstable and not solidly allied with U.S. interests.

In addition, the bombing of a pipeline in the Middle East or an oil embargo would paralyze the U.S. economy. But, short of such crises, volatile price shifts of fuel controlled by foreign suppliers shake municipal budgets. Furthermore, 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.
NATURAL GAS BUS AND TRUCK FLEETS: AN ENVIRONMENTAL/ECONOMIC SOLUTION FOR TODAY AND TOMORROW

Government officials, industry leaders and citizens in NYS increasingly recognize the exceptional problems caused by dependence on diesel fuel. But what are the solutions? For municipalities wanting the healthiest air, freedom from foreign oil, and the best economic investment going forward, the most attractive option is natural gas.

14.8 million natural gas vehicles travel the roads worldwide, but only 123,000 are in the U.S. (ranked 16 among nations). The move to natural gas refuse trucks began on the West Coast a decade ago and began spreading in the East in 2007. There are many reasons for this shift:

- Natural gas is a secure fuel. 97% of the natural gas consumed domestically is from North America and U.S. supplies are projected to last for decades.
- With expanded drilling, natural gas prices are at rock bottom — costing $1-$2/gal less than diesel.
- It is the cleanest fuel widely available, being 80% hydrogen, and it burns more cleanly than diesel even as trucks age.
- Compressed natural gas (CNG) is 67-94% lower in particulate matter and 50% lower in smog-forming nitrogen oxides compared to diesel. CNG trucks and buses generate 20%-25% fewer greenhouse gas emissions.
- Natural gas engines are fully commercial and operate cleanly and quietly.
- Best of all, engines and refueling stations installed to use fossil gas are exactly what are needed to move to an even better gas fuel: the renewable form of natural gas made from organic wastes, called “biomethane” or “RNG.” NYS is ripe with potential to produce and use “frack-free” RNG. (See p. 4)

NY STATE CNG VEHICLE STATUS REPORT

There were 31,325 alternative fueled vehicles on the road in the State as of 2009, of which 10,017 are powered by natural gas fuel.

Natural gas fueling infrastructure—This is essential if the number of CNG vehicles in the State is to grow. For the 10,017 natural gas vehicles in NYS today, there are just 106 CNG refueling stations. 34 are open to the public, with prices ranging from $1.30 to $3.03/gallon, compared to 6,500 gasoline fueling stations (2008). But as gasoline and diesel prices continue to increase, the lower cost of natural gas fuel is attracting rising interest in natural gas vehicles. For a national map including NYS stations and the price of CNG fuel, visit “www.cngnow.com”.

Transit Buses—While there are no total figures on transit buses in NYS, 6,783 transit buses operate in New York City. Of these, 1,112 are CNG buses, 1,171 are the more fuel-efficient hybrid-electric buses, the largest such fleet in the world, but the vast majority, 4,500, still burn diesel. (MTA awarded New Flyer Industries, a Winnipeg-based company, a $216 million contract in 2010 for 135 new replacement CNG buses with the option of ordering 250, with the base order delivered in 2012.) The 277 transit buses operating in Nassau and Suffolk County on Long Island are all CNG buses.

Garbage trucks—There are over 136,000 refuse trucks operating in the U.S. and while no total is available for NYS' contribution, NYC alone had 5,150 in 2005. Refuse trucks are major contributors to pollution and CO₂ emissions as most operate on diesel fuel at an average of 2.8 miles per gallon and over 8,900 gallons per year. In 2006, Smithtown, NY on Long Island introduced the first program on the East Coast that required all refuse trucks serving the community to be powered by natural gas by January 2007. The pioneering Smithtown example inspired many other Long Island communities to follow suit as of the end of 2011. Smithtown, Huntington, Brookhaven, Oyster Bay, and East Rockaway had a total of 172 CNG trucks. Nassau County also had 5 heavy-duty dump trucks repowered to CNG. Other areas include the Buffalo Niagara region (15), which hopes to expand to 40 by
the end of 2012. Following Smithtown's lead, some private waste companies have begun buying CNG trucks voluntarily. They include Filco Carting (3) and Metropolitan Paper Recycling in NYC (9).22, 23

Delivery trucks—Private companies own 2,350,911 trucks in NYS.1 These companies are also turning to alternative fuels. Some notable examples: Manhattan Beer Distributors deployed 15 CNG trucks in their Bronx location in 2002 and have now expanded to 45 at their Brooklyn and Long Island facilities and plan for 100% of their 500 truck fleet to go to CNG.24 UPS bought its first 10 CNG trucks in NY in the 1980s. It now has 55 AFVs in the State and 1445 nationally.25 UPS doesn't specify the breakdown by fuel. Snapple has 27 CNG trucks in Red Hook Brooklyn (2001).26 AT&T has over 3,400 CNG vehicles and 1,600 hybrid electric vehicles in its nationwide fleet as of January 2012.27

School Buses—There are nearly 50,000 school buses operating in NYS carrying 2.3 million children to school everyday.28 Each diesel bus produces on average 400 pounds of NOx/Non-methane hydrocarbons, 900 pounds of CO, 14 pounds of PM, and 23 tons of GHGs per year.29 Every school child is exposed to these emissions. CNG school buses can significantly reduce pollution and reduce health risks to children. But EV data has identified just two CNG fleets: 28 CNG buses in the Long Beach School District (Suffolk) and 21 in the Middle Country Central School District (Suffolk County).29

Taxis—13,087 taxis operate in New York City30, by far the largest fleet in the country. As of 2011, 4,980 of the NYC taxi fleet were hybrid-electric vehicles, and in Spring 2012, 6 all-electric Nissan Leaf vehicles joined the taxi fleet as part of a pilot program.31, 32 Very few natural gas taxis are currently in operation. However, in the fall of 2011, the Taxi and Limousine Commission (TLC) approved the purchase of the MV-1 taxi, a wheelchair-accessible cab that can be purchased with a CNG fuel system option.33 The NYC MTA Access-a-Ride Program has the first 30 MV-1’s in operation, 15 of which are natural gas-powered. 32

Government fleet—NYS planned to shift its 14,964 light-duty vehicles to alternative fuels by 2010. While this has not been achieved, the Clean Fueled Vehicles Council (CFVC) chaired by the Office of General Services has grown NYS’ alternative vehicle fleet from 383 in 1998 to 8,529 as of September 2008, 57% of the state’s light-duty fleet.35

As of 2007, the NYS Department of Transportation had 716 CNG cars, 10 hybrids and 35 heavy-duty dual fuel trucks.36

NYS’ Office of General Services awarded a 3-year contract to Empire Coachworks in 2010 to distribute natural gas vehicles (cars, SUVs, cargo vans, and pickup trucks) of 2010-model or after, to all municipal and government agencies in the State. Empire Coachworks converts existing and new gas or diesel fueling systems and replaces them with EPA- and CARB- certified CNG systems provided by Clean Vehicle Solutions and partner companies.35

WHAT’S NEXT FOR NEW YORK?

Much has been done to improve New York’s air quality, but the chance to embrace natural gas for fleets to a much larger degree would bring enhanced energy security, environmental, and economic gains.

RENEWABLE NATURAL GAS—THE SUSTAINABLE OPTION

Perhaps the greatest long-term benefit is the role that natural gas use plays as a stepping-stone towards the use of an even better gas fuel. Use of natural gas in heavy-duty fleets paves the way for a transition to renewable natural gas (RNG), which is
obtained, not by drilling, but by processing the biogases generated wherever organic wastes are breaking down in an airless, contained environment. In 2008, NYS generated 7.2 million tons of municipal solid waste (MSW). From the total amount of waste generated, only 36% was recycled and 8% used for combustion (incineration). Within the stream of MSW, 33% of this is paper and 23% is organic waste, suggesting that well over a third of the waste generated could be converted to RNG through the process of anaerobic digestion.

Collecting and refining these gases can turn NYS’s expensive garbage problem into a renewable fuel solution! RNG, on a well to wheels basis, emits 88% less carbon-dioxide than diesel. In some cases it is carbon neutral, since its production captures more methane (a powerful greenhouse gas) than the vehicles using it emit. RNG is already being widely used in vehicles in Europe, and as production in the U.S. grows, fleets using fossil natural gas today can blend the fuels or make a full “seamless” transition to this first truly sustainable fuel.38

New York State is superbly positioned to reap the benefits of RNG, since it has bountiful feedstocks for producing it: it has the fourth largest dairy herd in the nation, a $3 billion per year food processing industry, and a sizeable amount of waste in its 27 largest landfills, and at its over six hundred sewage treatment plants.

Municipalities and cities could generate fuel from their wastes and, at the same time, reduce both their fuel and waste disposal costs. In the State’s most populous urban center, New York City, it costs a whopping $325 million a year to send municipal wastes to out-of-state landfills – wastes that contain sufficient organics to produce renewable natural gas that could power thousands of heavy-duty buses and trucks for two decades or more.

HOW NEW YORKERS CAN HELP

Alternatively fueled vehicles are available in the market. New Yorkers can help promote the shift to cleaner fuels and more efficient engines by making their next car a hybrid electric or natural gas vehicle (if bicycles and mass transit are not available). The Honda Civic GX, a natural gas vehicle, is commercially available, achieves 27-38 mpg, and was considered the “Greenest Vehicle in 2012” by the American Council for Energy Efficient Economy (ACEEE).39 The Toyota Prius and Honda Civic hybrid can achieve from 40 up to 55 mpg, compared to the average of 18 mpg by standard vehicles.

Every New Yorker can have an important voice, by encouraging state and federal legislators to support reinstatement of federal tax credits helping overcome the higher costs of these new vehicles; by encouraging the State to create a grant program covering part of the higher costs for CNG vehicles as an added incentive; by letting community leaders know how important it is to put cleaner natural gas refuse fleets, transit and school buses and taxis into service, and by distributing this fact sheet to friends and colleagues!

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Prepared by: Alexandra Tung

Energy Vision, a national non-profit organization, analyzes the clean petroleum-free fuels of the future and collaborates with public and private sector leaders in promoting change. EV’s team published the first reports on alternative fuels for transit buses (2000) and refuse trucks (2003), spurring initial interest in the natural gas option. EV now focuses on turning U.S. wastes into a renewable form of natural gas. (www.energy-vision.org)

To support EV’s NYS Outreach, please visit: http://www.energy-vision.org/support-EV.html

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:

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REFERENCES


7 “Trucker Heart Disease Study and Diesel Particulate Air Pollution.” California Green Solutions. Web 19 March 2012 http://www.californiagreensolutions.com/cgi-bin/gt/plth.content=1837


25 L. McIntire, UPS


32 Brian Perone, Clean Energy


36 NYS DOT Activities, https://www.dot.ny.gov/programs/climatechange/activities


40 NGV Global, http://www.ingv.org/current-ngv-stats/