

**Testimony of Commissioner Vincent Sapienza, P.E.  
NYC Department of Environmental Protection**

**FY 2019 Preliminary Budget Hearing before the New York City Council  
Committee on Environmental Protection and Subcommittee on Capital Budget  
March 14, 2018**

Good morning Chair Constantinides and Chair Gibson. I am Vincent Sapienza, Commissioner of the New York City Department of Environmental Protection (DEP). With me today are Chief Financial Officer Joseph Murin and Deputy Commissioner of Public Affairs Michael DeLoach, as well as our senior leadership team.

Chair Constantinides, we look forward to continuing to work with you on our shared priorities for sustainability, resiliency, environmental justice, and protecting the environment for all New Yorkers. Chair Gibson, Congratulations on your new role! I know we will continue to work closely as we manage our financial resources and invest in critical infrastructure.

A special welcome to all of the new Council Members this year. We look forward to highlighting the good work of our agency and being responsive to your questions or concerns, as I believe we have with existing members. Thank you for the opportunity to testify today and I look forward to answering your questions.

DEP has overall responsibility for the City's water supply and sewer system, including providing drinking water to all New Yorkers, maintaining pressure to fire hydrants, managing storm water, and collecting and treating wastewater. In addition, DEP regulates air quality, hazardous waste, and critical quality of life issues, including noise. All of our water-related expenses—both operational and capital—are paid for with the money collected from the water and sewer rate charge billed to our 834,000 ratepayers. This water rate is authorized annually by the New York City Water Board.

As you know, Mayor de Blasio completely eliminated the rental payment five years sooner than originally projected. The full elimination of the rental payment will result in a total savings of 7% - or \$1.1 billion - for our customers through FY 2020. In 2016, the City proposed, and the Water Board approved, a \$183 credit to more than 664,000 homeowners that was subsequently challenged in court. We are happy to report that the Court has ultimately upheld the Board's authority to issue the credit. DEP posted the \$183 credit to eligible accounts earlier this year. We are pleased to put this issue behind us and look forward to the standard process for rate setting, with the Board presenting its Fiscal 2019 water rate proposal in April followed by five borough public hearings starting in May.

I would also like to take a minute to highlight that our harbor is cleaner and healthier today than it has been in more than a century. Key indicators of water quality, including concentrations of bacteria and nitrogen continue to drop, while dissolved oxygen is on the rise. We are hearing more and more reports of whales, dolphins, and seals returning to our waterways and we are proud to see our hard work has been paying off!

And finally, I wanted to highlight an accomplishment from last session that will have a real impact for New Yorkers – reducing construction noise. Local Law 53, sponsored by CM Kallos, passed by the EP committee and signed by Mayor de Blasio, will reduce construction-related noise across the City – the #1 complaint for 311. As you know, the law authorizes DEP to take street-level sound measurements in the public right of way, 50 feet away from construction-related noise sources. Previously, DEP inspectors were limited to measuring noise levels from within the dwellings of residents who filed noise complaints. This new law establishes different enforceable sound levels for residential and commercial areas, as well as for street work. In the event that a construction-related noise complaint cannot be resolved, DEP can now issue limited stop-work orders for equipment that exceeds noise levels, while allowing the rest of construction to continue. It's a great piece of legislation and we appreciate the collaboration between the council and DEP.

### **FY19 Preliminary Four-Year Capital Plan**

DEP's FY19 Preliminary Four-Year Capital Plan is approximately \$11.2 billion for FY 19 - 22, as presented by Mayor de Blasio on February 1, 2018. This is an increase of \$748 million, or 7.2 percent, over the FY 18 September Capital Improvement Plan of \$10.4 billion. This funding will allow our nearly 6,000 employees to continue to expand upon our history of reliability and innovation.

I will now provide highlights of the fiscal 2019 – 2022 plan focusing on the drinking water supply, the sewer network, harbor water quality, and initiatives to promote the overall health of the New York City environment. I will also provide updates on performance metrics pertaining to the mission of our complex agency.

#### **Drinking Water**

The New York City water supply system provides approximately one billion gallons of safe drinking water daily to more than 8.5 million people. This includes residents of New York City, millions of tourists and commuters who visit the City throughout the year, and approximately one million people living in the counties of Westchester, Putnam, Orange, and Ulster. In all, the New York City water supply system provides nearly half the population of New York State with drinking water.

We work hard to deliver an exceptionally high quality of water - one that regularly wins national taste tests! DEP scientists collect water samples 365 days a year from our expansive reservoir system, the aqueducts that deliver the water to the city, and the roughly 1,000 sampling stations across the five boroughs. These water samples are delivered to one of DEP's four state-of-the-art laboratories where scientists analyze them more than 600,000 times annually. In addition, robotic monitoring buoys on the reservoirs provide an additional 1.2 million measurements that help us send the best water to the city at all times.

For FY19-22, the Administration is proposing to invest significantly in protecting the quality of our reservoirs and the integrity of our dams, providing for treatment where necessary, and maintaining and repairing the water main system conveying potable water to all New Yorkers.

We have budgeted a total of \$1.2 billion for water supply contracts, including \$30 million for closeout work at the Croton Filtration Plant, \$185 million to continue our watershed protection programs, and \$376 million to reconstruct dams in the watersheds

There is also \$1.2 billion allocated for the replacement of in-City water mains, which includes \$765 million for specific water-main work, \$77 million to accelerate the replacement of underground water distribution infrastructure, \$67 million for emergency contracts for water distribution, and \$85 million to keep our water distribution assets in a state of good repair. As cities around the country and world struggle to deliver safe drinking water due to drought, climate change, budget shortages and aging infrastructure; DEP is prioritizing the following projects and programs to guarantee the dependability and resiliency of the City's water supply system.

### FAD

For decades, New York City has recognized that it is environmentally sound and cost effective to protect drinking water at its source. In December, the NYS Department of Health awarded DEP a new 10-year waiver to continue delivering unfiltered drinking water from our Catskill/Delaware water supply, called the Filtration Avoidance Determination or FAD. This agreement commits the City, working with our upstate partners, to investing \$1 billion over the next decade towards programs that protect our drinking water. If the FAD had not been renewed, and the City was required to build a new filtration plant, it would have cost upwards of \$10 billion to build and over \$100 millions of dollars additionally each year to operate. These costs would have to be passed on to our ratepayers.

Maintaining the FAD is one our highest priorities, and the City's science-based approach to watershed protection has made our program a national and international model for water protection. To protect our water supply, DEP has preserved more than 150,000 acres of land, upgraded wastewater infrastructure throughout the watershed, worked with farmers to ensure their operations are both efficient and protective of water quality, and focused considerable attention on the natural infrastructure of our streams, wetlands, and forests. These programs are critical to our success and the capital plan includes \$185 million to continue FAD related programs over the next four years.

### Delaware Aqueduct Repair

I am pleased to report that work progresses on schedule, and on budget, for the \$1 billion Delaware Aqueduct repair, which includes the construction of a 2.5 mile bypass tunnel that will be drilled 600 feet below the Hudson River from Newburgh to Wappinger. DEP began tunneling last September and expects to make the connection to the existing tunnel in 2022.

### City Water Tunnel No. 3, Stage 2 - Brooklyn-Queens Leg

The plan includes \$600 million to complete the Brooklyn-Queens leg of City Water Tunnel No. 3, which includes funding to construct two new shafts in Queens. In December 2017, DEP brought the Brooklyn-Queens leg of the tunnel to a state of activation readiness, meaning that in the unlikely event of a major failure of City Water Tunnel No. 1 or 2, DEP could deliver water through City Water Tunnel No. 3.

### Kensico – Eastview Tunnel

DEP has allocated an additional \$35 million for the Kensico-Eastview Connection Tunnel, bringing the total allocation to \$808 million for this project. When completed, this project will provide additional redundancy to NYC’s water delivery system.

### Ashokan Reservoir/Olivebridge Dam/Dividing Weir Bridge

An additional \$33 million was added in the Plan, for a total of \$117 million, for upgrades to the Ashokan Reservoir, Olivebridge Dam, and Dividing Weir Bridge. Upgrades to these nearly 100-year-old assets will ensure continued compliance with New York State dam safety regulations as well the continued safety of the public traveling over the Dividing Weir Bridge.

## **Sewers**

DEP is responsible for the maintenance of more than 7,000 miles of sewers throughout the City. Over the last several years, DEP has embraced a data-driven, proactive approach to operating and maintaining this sewer system. By using a range of digital tools and innovative practices, DEP developed targeted programs to provide a high level of service to our customers while focusing on investments that prioritize resources.

Over the past decade, these programs have significantly driven down confirmed sewer backups. Since 2013, we have also been more proactively cleaning sewers, rather than the previous practice of reactively cleaning them after a backup occurred. In 2017, more than 400 miles of sewers were proactively cleaned.

The leading cause of sewer backups continues to be the buildup of fat, oil, and grease. In 2017, this caused 70% of confirmed backups. Since 2015, DEP has engaged thousands of households, multi-family properties, religious organizations, civic associations, and educational institutions in communication on the proper disposal of used cooking oil and its harmful effects on the sewer infrastructure.

Credit for another successful sewer initiative goes to the City Council with passage of Local Law 48 of 2015. The law required DEP to inspect and clean as necessary all 148,000 street catch basins on a yearly basis, rather than on the prior 3-year cycle. The accelerated cycle proved beneficial both for debris removal and to more quickly address defects that required repair.

The plan for FY19 – 22 projects \$2.6 billion of spending on sewers, which includes the build-out in Southeast Queens for \$796 million. In addition, the Plan allocates:

- \$916 million to replace sewers (storm, sanitary or combined), including the Mayor’s initiative for accelerated replacement
- \$1.6 billion to construct new sewers (of all types), of which \$112 million is for high-level storm sewers, and
- \$270 million to expand the bluebelt system in Staten Island

## Southeast Queens

Southeast Queens experienced rapid residential and commercial growth from the 1920s through the 1960s, and many of the natural watercourses that previously drained the area were paved over by developers, exacerbating flooding. The low-lying topography of the area and the enlargement of Kennedy Airport significantly complicated the installation of large storm sewers, making planned work extremely costly. Major projects had been deferred until Mayor de Blasio authorized \$1.5B over ten years for the Southeast Queens Flood Mitigation Plan. This has since increased to \$1.9B.

Together with our partners at the Department of Design and Construction and the Department of Transportation, DEP has developed a four-pronged approach to improve conditions in the area:

- Construct quick fixes, such as storm sewer extensions, targeted full size sewers, and green infrastructure to bring near-term flooding relief.
- Build neighborhood sewer projects where there is existing available capacity in the sewer system.
- Create future capacity for further neighborhood sewer projects by investing in large trunk sewers.
- Evaluate opportunities to reduce groundwater flooding.

Together, these four approaches are starting to deliver both immediate and long lasting relief for many residents of Southeast Queens. As requested by the council, an easy-to-use map is now available on our website.

## **Wastewater Treatment**

DEP manages an average of 1.3 billion gallons of wastewater each day through one of our 14 treatment facilities. In alignment with wastewater utilities across the country, DEP is embracing best practices to ensure a sustainable future that minimizes waste, maximizes resources, protects our ratepayers, improves the community, and embraces innovation.

Wastewater resource recovery is an essential element in delivering maximum environmental benefits at the least cost to society. DEP is working to promote our role in energy optimization, greenhouse gas reduction, carbon sequestration, and operational improvements to efficiently manage the expense budget while expanding environmental opportunities.

The Plan projects a \$2.6 billion capital investment for the upgrade, reconstruction, or replacement of components of the wastewater treatment plants and pumping stations. While DEP is a world-leader in water supply delivery and wastewater treatment, we are constantly looking for innovative ways to curb costs and enhance the environment of New York City. These efforts include commitments to Zero Waste and the Mayor's 80x50 initiatives.

## Zero Waste

In 2017, our wastewater facilities generated 490,000 tons of biosolids, which are nutrient-rich organic materials that are generated during the wastewater treatment process. Last year,

approximately 74% of biosolids were landfilled, 15% were used as alternative daily landfill cover, and 11% were beneficially reused through mine-land reclamation and composting. Our goal of 'zero by 30' is to have non-landfill beneficial use of 100% of our biosolids by the year 2030, with year over year progress starting in 2019. To this end, we are in the process of awarding a 150-ton-per-day contract for beneficial use only, as well as developing short- and long-term master plans for beneficial end use.

As you may recall, DEP, in conjunction with Waste Management and National Grid is launching a pilot demonstration project at the Newtown Creek Wastewater Treatment Plant to accept food waste from the City's organics program. DEP began accepting food waste in 2016, and has ramped up to 80 tons per day of food waste today. In addition to supporting the city's Zero Waste initiative, this effort also increases digester gas production, a clean fuel. By the end of 2018, we expect that National Grid will complete construction of their biogas scrubbing system, which will allow excess digester gas to be delivered back into the natural gas system.

### 80 x 50

In support of the Mayor's commitment to reduce greenhouse gas emissions by 80% by 2050, DEP has launched a number of initiatives, which I will briefly describe:

- **Digester Gas:** On average, our wastewater facilities generate 3.6 billion cubic feet of digester gas per year, of which approximately 35% is used at the plants to power our boilers and engines, while the remaining gas is flared. Over the next three decades, DEP will phase out the flaring of gas by developing on-site uses (such as expanding our ability to use it as a substitute for fuel or electricity) and delivering our digester gas into the natural gas grid.
- **Solar:** By leveraging DCAS funding, DEP is currently conducting a solar photovoltaic and energy-storage feasibility study for the Wards Island plant, at which there are prime opportunities to install solar photovoltaic canopies over wastewater-treatment process tanks. In addition, DEP is also evaluating ground-mount and parking canopy solutions in the watershed.
- **Energy Conservation Measures:** Over the past 7 years, DEP has identified more than 400 energy conservation measures. As these facilities are upgraded, DEP is seeking opportunities to integrate energy conservation measures into its state-of-good-repair capital planning process.
- **Cogeneration:** Cogeneration uses methane produced during the wastewater treatment process to generate electricity and heat. In 2017, DEP began construction on a \$267 million project at North River to replace the plant's existing diesel-powered systems with five new natural gas-fired and digester gas-fired cogeneration engines. This project will result in improved energy efficiency, power supply reliability, and air quality, while also maximizing the beneficial use of methane produced on-site.

### Hunts Point Digesters

Included in the Plan is \$220 million to upgrade the digesters at the Hunts Point Wastewater Treatment Plant, which will more effectively break down organic matter, reducing the amount of

residual solids that need to be trucked from the site through the neighborhood. More methane gas will also be produced, which will be used to offset purchased fuel.

## **Harbor Water Quality**

Approximately 60% of the City is served by combined sewers, where stormwater runoff and sanitary waste are conveyed in a single pipe beneath each street to a wastewater treatment plant. The system was originally designed so that during moderate to heavy rain events, excess water gets released untreated into local waterways, which is referred to as combined sewer overflow or CSO.

When the LTCP process kicked off in 2012, DEP began engaging the public in the development of each plan. Over the years, we have listened to feedback on ways to improve our public engagement strategies. In response, we have worked to make our presentations and informational materials more user friendly, coordinated with local organizations on meeting dates and locations, held dozens of public meetings, and responded to public comments. Last November we announced that, going forward, the public will have an opportunity to review and comment on our proposed plans before they are submitted to the DEC.

Under the Long Term CSO Control Plans, DEP will be investing at least another \$4.4B to make further CSO reductions over the next 25 years. The Plan includes \$1.5 billion for planned consent-order work related to the Long-Term Control Plans for combined sewer overflow. In 2017, NYS DEC approved seven of the City's plans, with two additional plans under review by the State. Two of these plans call for enormous CSO storage tunnels beneath Brooklyn and Queens to reduce further overflows into Flushing Bay and Newtown Creek. DEP is currently developing two more plans, one for Jamaica Bay, and another for the East River and Open Waters. Once the plans are identified, we will be able to estimate costs associated with such plans.

The approved LTCPs for Alley Creek, Flushing Creek, and the Hutchinson River include projects to disinfect CSOs using bleach, with the intent of significantly reducing pathogens during the recreational season. I recently met with several environmental groups and I acknowledge their concerns about residual chlorine entering water bodies where it could potentially have an effect on marine biota. It should be noted that these three projects will also include dechlorination systems to eliminate any residual chlorine compounds prior to release, and we will conduct extensive environmental reviews during the design phase before proceeding with construction.

The ultimate goal of eliminating CSOs is daunting, given the challenges of siting extremely-large infrastructure in a very dense city and the massive capital cost, which could exceed \$30 billion for New York City. The LTCPs represent a significant next step, and one that won't break the backs of middle- and working-class homeowners who pay a water bill. DEP looks forward to continuing dialogue with the stakeholders, the City Council and with NYS DEC on this complex issue.

## Green Infrastructure

In 2010, DEP launched a green infrastructure program in the combined sewer areas of the City to reduce CSOs. DEP has worked diligently to advance construction of green infrastructure in priority areas, which reduces the amount of stormwater runoff entering the wastewater system and adds multiple co-benefits for New Yorkers, such as decreased ponding, increased shade, and community greening. To date, DEP has constructed approximately 4,000 green infrastructure assets, the majority of which are located in the right of way.

From its outset, DEP committed \$1.5 billion for the Green Infrastructure Program, of which over \$468 million has been encumbered to date and another \$990 million has been budgeted through fiscal year 2027. This funding will be used to continue to build the right-of-way rain gardens, as well as green infrastructure retrofits on City-owned property through partnerships with the New York City Housing Authority and the Departments of Education and Parks & Recreation. These partnerships allow us leverage funding and support other City-initiatives such as DPR's Community Parks initiative. We have added \$50M to that program ensuring that these parks are managing stormwater runoff and contributing to healthier waterways. To date, DEP has completed 48 public retrofit projects with our partners, and 200 are currently in design.

## Gowanus Canal

The Gowanus Canal project is a major priority for DEP. The EPA has required the City to limit CSOs into the canal by constructing two underground tanks and associated infrastructure to intercept and store CSOs during wet weather events. We are in the final step of our ULURP application with the Council hearing just this past Monday. We have been pleased that stakeholders seem to approve of our approach with the Community Board, Borough President, and CPC all supporting our application with conditions. We are hopeful to acquire the properties without eminent domain, but will still meet our milestones even if that is not the case. It is important to meet schedule milestones on this project, as if we do not stay on schedule, the EPA could have us move the project to the adjacent park and pool. We share the community's opposition to that alternative.

## **Preliminary FY 2019 Expense Budget**

The projected Expense Budget for the current fiscal year, FY18, is \$1.3 billion, including approximately \$80.2 million in Community Development Block Grant funds for the "Build it Back" program, for which DEP serves as the contracting entity for the City. Therefore, backing out Build it Back, DEP's FY19 Preliminary Expense Budget is \$1.2 billion.

The Preliminary FY 19 Expense Budget breaks down into the following large categories:

- \$543.8 million (41.6%), in personal services to pay the salaries for our nearly 6,000 funded positions
- \$763.8 million (58.4%), for other than personal service costs (OTPS), which includes:
  - Taxes on upstate watershed lands, which account for \$167.2 million or nearly 12.8% of the expense budget. As you know, the ownership of watershed lands represents a critical investment in maintaining the high quality of the City's



drinking water by protecting it at the source and ensuring that it does not require more expensive treatment, such as filtration. I am pleased to report that we have successfully negotiated agreements with upstate jurisdictions to make our tax obligations more stable and predictable.

- DEP's energy costs, including heat, light, and power, account for \$92.8 million or 7.1% of the FY19 Expense Budget. DEP is the third-largest municipal consumer of electric power in New York City after the Department of Education and NYC Health + Hospitals, and our consumption will grow as we bring online new treatment processes for wastewater. To control energy costs and meet Mayor de Blasio's major commitment to reduce greenhouse gas emissions, DEP is investing in projects to reduce energy needs, including the cogeneration plant at the North River Wastewater Treatment Plant that I mentioned earlier.
- The chemicals that are necessary for both our drinking water supply and wastewater treatment are estimated to cost \$49.0 million in FY19 or about 3.7% of the Expense Budget. For drinking water, DEP continues to add chlorine and fluoride to Cat/Del water in order to meet federal, state and city treatment requirements. Also for drinking water, the treatment processes at the new Croton Water Filtration Plant require chemical additions. Our wastewater plants rely on the addition of polymers, sodium hydroxide, glycerol, and ferric chloride and other chemicals to improve removal rates, and continue to disinfect their effluent with chlorine compounds as we have done since the 1930s.
- Sludge management of 1,200-1,300 tons per day is projected to cost about \$56.4 million in FY19, or about 4.3% of the Expense Budget. As mentioned earlier, we will continue to identify ways to reduce these costs by finding a more beneficial use.

### Cost Savings Initiatives

DEP has also taken a hard look at our processes to identify where we can reduce costs without sacrificing quality or reliability. One example of this is on the chemical Glycerol, which DEP uses to meet strict regulatory requirements to remove nitrogen from wastewater. In 2017, DEP spent almost \$8 million for glycerol. In an effort to reduce costs, DEP rebid the glycerol contracts with improved contract terms and achieved a price reduction of approximately 55% per pound of glycerol (about \$4 million in savings overall). We are anticipating several million in savings in 2018.

In addition, through the ingenuity of our workforce, DEP attained \$3.4M in savings last year through operational changes to process air systems, overhauling tanks in-house, and other creative initiatives. We look to expand on best practices and increase these savings in the future.

On behalf of the almost 6,000 employees at DEP across the city and upstate, I want to again express our appreciation to Chairman Constantinides for his strong leadership, and express our continued commitment to collaborating with all of our council partners to continue delivering on our agency's mission.

I thank you for the opportunity to present testimony today and look forward to answering any questions you may have.



**NY City Council Preliminary Budget Hearings  
Committee on Sanitation and Solid Waste Management**

**Supporting Documentation for Energy Vision's Testimony**

*March 14, 2018*

We appreciate the chance to present Energy Vision's research findings at these important budget hearings, specifically regarding New York City's vehicle procurement expenditures and how they may contribute most to our City's progress in attaining the ambitious greenhouse gas (GHG) reduction, clean air and zero waste goals in the *NYC Clean Fleet* and *OneNYC* plans.

Energy Vision, a national environmental non-profit organization, is a recognized authority on waste and clean fuels issues. We report on strategies that can move our country most rapidly toward a sustainable future, and conduct outreach and workshops educating citizens and public and private sector leaders on the most constructive options for change.

In tracking the development of all vehicle fuels, we have come to focus particular attention on an emerging transportation fuel for heavy-duty buses and trucks that has all the characteristics for sustainability. This gaseous fuel is made from a renewable resource (organic wastes) and involves no drilling. When it is burned, it generates virtually none of the particulates or other health-threatening emissions related to diesel fuel, and it is by far the lowest carbon fuel commercially available today.

Our analysis of the City's *NYC Clean Fleet* document shows that the City has made some distinct progress toward its clean air and greenhouse gas reduction goals with shifts of light-duty vehicles to electric models and integration of biodiesel blends fleet-wide. However, reaching them requires a major shift away from diesel fuel, above and beyond the approaches laid out in the 2015 *Clean Fleet* plan. And we find no reference to the waste-based gaseous fuel strategy that Energy Vision has found to be a viable option today, which we will describe further, and which offers the best chance for the City to meet or even exceed its important fleet goals.

We believe that the City can no longer justify spending money on new diesel vehicles, now that much cleaner, cost-effective commercial alternatives exist. One step the City can take, starting with the FY 2019 budget, is to require agencies proposing fleet purchases linked to the annual vehicle procurement budget to select heavy-duty vehicles that are available in zero or near-zero emission models.

**The Vehicle Fleet Goals set for New York City**

*Recognizing climate change to be "an existential threat to New Yorkers and the world," New York City has set a goal of cutting its greenhouse gas emissions 80% by 2050 (against a 2005 baseline) and has included an ambitious goal of cutting these emissions from its fleets by 80% even sooner – by 2035. The City's OneNYC Plan also aims to achieve the best air quality of any major American City by 2050.*

The City's *NYC Clean Fleet* plan identifies specific strategies for achieving emissions reductions for its roughly 17,000 light-duty vehicles, some to be applied fleet-wide, but only three broad options for the roughly 10,000 medium and heavy-duty diesel vehicles operated mostly by the Department of Sanitation, Parks Department, NYC Department of Environmental Protection and Department of Transportation.

Energy Vision's analysis has found that, as structured, it has barely any chance of meeting the goals, largely because of inadequate measures for the diesel-burning heavy-duty trucks which generate the largest share of both GHGs and health-threatening particulate, sulfur dioxide and nitrogen oxide emissions. The good news, however, is that affordable modifications to procurement practices for the heavy-duty portion of the fleet could enable the City to meet its goals or go beyond them.



Looking at its greenhouse gas reduction goal first: in setting its 80x35 GHG reduction goal, the City’s 2015 *NYC Clean Fleet* report works from 2005 baseline emissions of 285,000 metric tons a year; to achieve an 80% GHG reduction goal by 2035, total emissions must fall to 57,000 metric tons. With 2015 emissions from the 27,000 fuel-burning vehicles in City fleets at 255,000 metric tons, emissions must still be cut by an additional 198,000 metric tons of carbon-dioxide equivalent (“CO<sub>2</sub>e”),<sup>1</sup> or 77%.

At the time of the 2015 report, 40% of total fleet fuel was gasoline (11.7 million gallons),<sup>2</sup> used in light-duty vehicles, with related emissions of about 98,000 metric tons of CO<sub>2</sub>e.<sup>3</sup> The other 60% of fuel was diesel blends (17.5 million gallons) used in heavier vehicles with related emissions of 162,000 metric tons of CO<sub>2</sub>e.<sup>4</sup> With diesel vehicles responsible for this large share of GHG emissions (63%), reaching the “80x35” goal will require significant diesel displacement.<sup>5</sup>

**The Clean Fleet Plan Can’t Reach its GHG Reduction Goal using Strategies it Proposes**

The *NYC Clean Fleet* plan enumerates four strategies to be implemented fleet-wide. It sets a specific goal for its light-duty cars and trucks – adding 2,000 electric vehicles (EVs) by 2025, of which 1,000 have already been added. It also designates two specific fuel efficiency fleet goals, and a specific anti-idling goal. Achieving all of these would take the fleet 33% of the way to its goal. What about the rest?

For the City’s heavy-duty diesel vehicles, *NYC Clean Fleet* identifies three strategic options:

- **Option one** involves using high biodiesel blends (20% year-round and 50% seasonally) in all these vehicles, which would cut GHGs 10%, bringing the total GHG reduction, when combined with the “whole-fleet” measures, to 43%.
- **Option two** involves using high biodiesel blends in half the fleet and compressed natural gas fuel in the other half, cutting more GHGs – 14% – and bringing the total GHG reductions to 47%.
- **Option three** involves using “renewable diesel fuel” in one-third of the fleet, and high biodiesel blends and CNG in the other two-thirds, cutting GHGs by 34% and bringing the total GHG reduction up to 67% out of the 80% required by 2035.

The report includes two diesel displacement strategies – natural gas and renewable diesel – but simultaneously claims considerable impediments to deploying them. First, it labels infrastructure upgrades for managing CNG (primarily ventilation in the depots) as a “formidable” obstacle. Then, it notes that renewable diesel is unavailable in the northeastern United States and it is uncertain when it might become available. Nonetheless, the charts below (and on the following page) list all the strategies and the greenhouse gas reductions envisioned by each.

***The NYC Clean Fleet Plan’s four Emission Reduction Strategies, IF applied to all City Vehicles (“whole-fleet measures”), and their Impacts on Greenhouse Gas Emissions***

Measures being applied to whole fleet	% GHG reduction	Reduction in metric tons	% GHG reduction remaining	Reduction in metric tons remaining
Whole-fleet 1: Add 2,000 electric vehicles	9%	22,950	71%	175,050
Whole-fleet 2: Meet EPA 2018 fuel economy standards for medium and heavy duty vehicles	10%	25,500	61%	149,550
Whole-fleet 3: Meet EPA 2025 fuel economy standards for light duty vehicles	9%	22,950	52%	126,600
Whole-fleet 4: Anti idling & stop-start technology	5%	12,750	47%	113,850
<b>Whole-fleet GHG reduction total</b>	<b>33%</b>	<b>84,150</b>	<b>47%</b>	<b>113,850</b>



*Three diesel-specific Emission Reduction Options, on their own and combined with “whole-fleet” measures*

Diesel Strategy 1: All vehicles on higher biodiesel blends	
Diesel 1, % GHG reduction	10%
Diesel 1, reduction in metric tons	25,500
% reduction combined with all Whole-fleet measures (33%)	43%
Reduction in metric tons combined with Whole-fleet measures (84,150)	109,650
<i>% GHG reduction remaining</i>	<i>37%</i>
<i>Reduction in metric tons remaining</i>	<i>88,350</i>

Diesel Strategy 2: Half fleet on higher blends, half on CNG	
Diesel 2, % GHG reduction	14%
Diesel 2, reduction in metric tons	35,700
% reduction combined with all Whole-fleet measures (33%)	47%
Reduction in metric tons combined with Whole-fleet measures (84,150)	119,850
<i>% GHG reduction remaining</i>	<i>33%</i>
<i>Reduction in metric tons remaining</i>	<i>78,150</i>

Diesel Strategy 3: Divide fleet between higher blends, CNG and renewable diesel	
Diesel 3, % GHG reduction	34%
Diesel 3, reduction in metric tons	86,700
% reduction combined with all Whole-fleet measures (33%)	67%
Reduction in metric tons combined with Whole-fleet measures (84,150)	170,850
<i>% GHG reduction remaining</i>	<i>13%</i>
<i>Reduction in metric tons remaining</i>	<i>27,150</i>

**Procurement Options for Diesel Displacement in NYC’s Medium- and Heavy-Duty Fleets**

The city’s diesel fleet consumes 60% of the city’s fleet fuel and generates 63% of fleet-related greenhouse gases (GHGs), making it the most important target for reducing emissions of GHGs, nitrogen oxides (NOx), and particulate matter (PM). Energy Vision has been exploring options for diesel displacement since 2007.

**Biodiesel Blends.** First, it is necessary to note that the City has expressed great pride in its use of “biodiesel blends,” even calling them a fossil-fuel “alternative.” But they are not, in fact, a true fuel alternative. The 20% blend is still 80% petroleum-diesel, and at best, a 50% biodiesel blend in summer months still relies half on conventional diesel. These blends offer modest clean air benefits but they bear no resemblance to the big steps forward needed to clean up our air and cut GHGs in the City’s heavy-duty truck fleets.

**Electric Vehicles.** While EV’s – a true alternative – are proven at the light duty level, the technology for the heavy-duty sector is still in development. Electric heavy-duty trucks still lack the power and torque needed to perform adequately in NYC for the largest and highest impact diesel fleet – the 2,100 refuse trucks operated by the Department of Sanitation (DSNY) – which must both collect garbage and plow snow. They have also not performed consistently or well in snow, heat or on hilly terrain. Their cost at present is nearly double that of conventional diesel models, and considerably higher than natural gas models. Nonetheless, the City would do well to explore and pilot all-electric options for the future, especially for medium-duty vehicles as well as transit buses, as the MTA/NYCT fleet is now doing.

**Compressed Natural Gas.** This second fuel option – a fossil fuel but by far the cleanest of these fuels – is viable right now for all city vehicles powered by diesel or biodiesel, and has many advantages. Natural gas currently fuels approximately 150,000 transit buses, tractor-trailers and garbage trucks around the country. As the 42 CNG refuse trucks operated by DSNY have already shown, these vehicles can both collect garbage and plow snow. Combined with new “Near Zero” emissions engine technology, certified by both the California Air Resources Board and the US EPA, CNG use not only cuts greenhouse gas emissions by 30% compared to diesel, it also slashes health-damaging fine particulate and nitrogen oxide emissions 90% below the most stringent EPA standards. Further, the noise levels of natural gas engines are 50-80% lower than those of diesel engines. A shift to natural gas trucks would protect the health of the communities in which they operate, and allows citizen to sleep at night. It would also protect the health and hearing of truck drivers and fleet maintenance officials.

There is sufficient natural gas refueling infrastructure to serve hundreds more natural gas trucks today, with seven operational stations within the five boroughs that can serve agency fleet vehicles. The Department of Sanitation (DSNY) dispenses CNG from its Woodside, Queens garage (and refuels at another public-access station in Greenpoint, Brooklyn) and the Department of Parks from two. Public-access stations also exist at LaGuardia airport, JFK and at a National Grid location in Canarsie. A new public-access CNG station is

scheduled to open in the Bronx this spring in close proximity to a DSNY depot where 77 trucks are housed. Finally, there is a CNG station located at the Covanta waste-to-energy plant in Newark, New Jersey, to which DSNY trucks make over 100 visits a day. This station was built with the encouragement of DSNY, but has never refueled a single DSNY truck. According to the NYC *Fleet Maintenance Manual*, the City already “offers contracts for fueling at... private CNG fueling sites,”<sup>6</sup> and other private station developers have expressed strong interest in building additional stations.

As with any technology, design, permitting, safety and other considerations must be taken into account. However, the “formidable obstacle” to expanded use of natural gas trucks referred to in the *Clean Fleet* plan — the need to modify garages with proper ventilation — has been overcome at multiple locations. There are costs associated with these changes, but there are no engineering or technical challenges that cannot be met with current technology, as evidenced by indoor depots housing CNG transit and refuse fleets nationwide— including in New York City. For outdoor depots, of which there are many in NYC, this is not an issue.

**Renewable Diesel.** New York City in 2017 committed to piloting renewable diesel in its existing heavy-duty fleets. The interest in this fuel (also known as “green” diesel) arises from it being a drop-in substitute for diesel, requiring no alterations to fuel or vehicle – a huge advantage for large fleets currently using diesel.

While renewable diesel is made from similar materials as biodiesel — animal fats or vegetable oils — the two fuels are different. The process that makes renewable diesel replaces oxygen from the feedstock with hydrogen, which is supposed to make for a cleaner burn and a higher energy value than biodiesel. However, the fuel is in relatively short supply in the U.S. at present, and it is also considerably more expensive than conventional low-sulfur-diesel fuel.<sup>7,8</sup>

Renewable diesel offers modestly lower levels of particulate matter (PM), hydrocarbons and nitrogen oxides (NOx) than ultra-low-sulfur diesel.<sup>9</sup> But based on lifecycle emissions assessments by Argonne National Labs, the advantages of renewable diesel are hard to quantify. On a “well-to-wheels” basis (taking into account the environmental impacts of every stage of the fuel’s production and transportation, right up to it being combusted in a vehicle), GHG emissions from renewable diesel, depending on feedstock, are unquestionably lower — between 36% and 81% lower — than diesel. However, for NOx, sulfur oxides (SOx) and PM, renewable diesel appears, consistently across feedstocks, to have higher emissions than low sulfur diesel, often significantly so.

**Renewable Natural Gas (RNG).** The third option, mentioned earlier, is not a fossil fuel at all. It is the gaseous biomethane fuel (also referred to as Renewable Natural Gas, or “RNG”), which is made from captured methane gases that are naturally emitted by decomposing organic wastes. This has emerged as the most significant diesel displacement option, as it is made from a renewable resource (organic wastes), offers the lowest GHG emissions of any fuel, and produces the same low NOx, SOx and PM emissions as CNG. Further, because RNG production puts what was for decades considered garbage – organic waste – to valuable use, it can help NYC and other cities across the country meet their zero waste goals. *In fact, New York City’s food waste alone (approximately 1.2 million tons per year from commercial and residential sources) — if diverted to specialized tanks known as “anaerobic digesters” — could produce more than enough biomethane to displace the entire 17.6 million gallons of diesel now used to power ALL of the City’s 6,300 heavy-duty trucks<sup>10</sup>.*

Because RNG is chemically similar to conventional natural gas, it can be used in the same fully commercial CNG engines discussed above, with no modification to engines or fuel required. Since biomethane fuel can travel through the same natural gas infrastructure that now delivers CNG, a change in purchasing — through strictly contractual arrangements — would enable all existing natural gas vehicles, including MTA buses, to buy this ultra-low-carbon fuel instead. Moreover, the two major providers of natural gas vehicle fuel to NYC fleets today – Clean Energy Fuels and Love’s/Trillium—have both expressed their willingness to provide this fuel at the same cost as CNG.



This fuel’s environmental advantages are of particular importance. Because it involves no fracking or other forms of drilling, it can attract the support of city leaders and environmentalists alike. Further, it reduces lifecycle GHG emissions by 70% to 300%, as compared to petroleum-based fuels. Made by capturing and refining the methane gases emitted as organic wastes decompose, biomethane is a low-carbon winner. And if food wastes or animal manure are the primary source of the biogases, the fuel can actually be *net-carbon-negative*. That’s because the methane captured from these feedstocks in the fuel’s production — that would otherwise escape into the atmosphere — far exceeds the carbon dioxide emitted when combusted in a vehicle.

Biomethane is a fully commercial option. It is being used in 20,000 trucks and buses across the US. The entire Santa Monica, CA bus fleet is converting to biomethane fuel and “Near-Zero” engines. In Los Angeles, LA Metro recently purchased close to 300 new transit buses using the Near Zero engine/ biomethane combination, and is considering conversion of its entire 2,200-bus fleet.

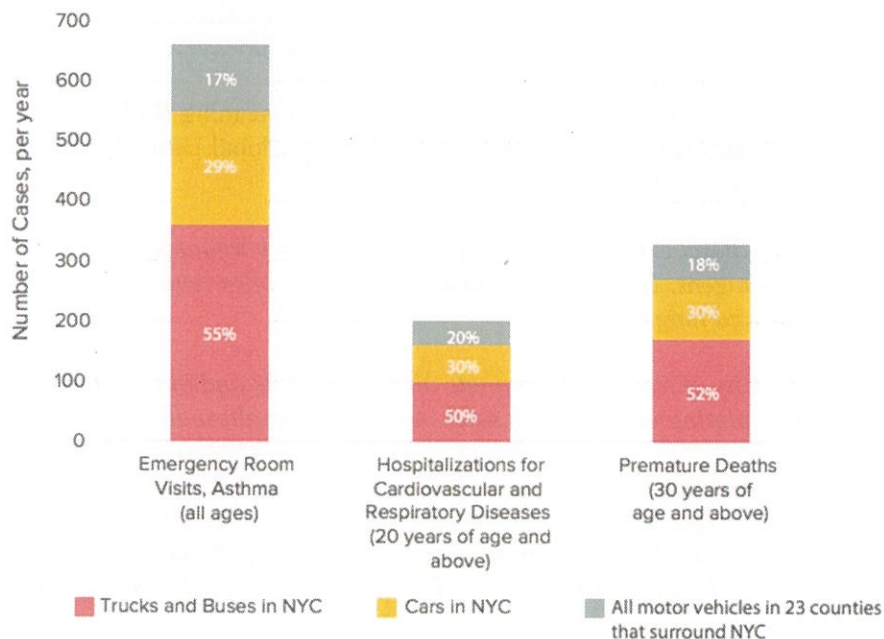
Hundreds of UPS trucks around the country are fueled with biomethane. Many private waste haulers including Republic Services and Waste Management, the nation’s largest hauler with 6,000 natural gas trucks. Several large cities, including Portland, OR and Toronto, Ontario, are also developing projects now to produce this fuel from their own solid waste and wastewater operations for use in fleet vehicles. Sacramento, CA has been doing this for five years.<sup>11</sup>

**Deploying Biomethane: A Clean Air Strategy Protecting Millions of New Yorkers**

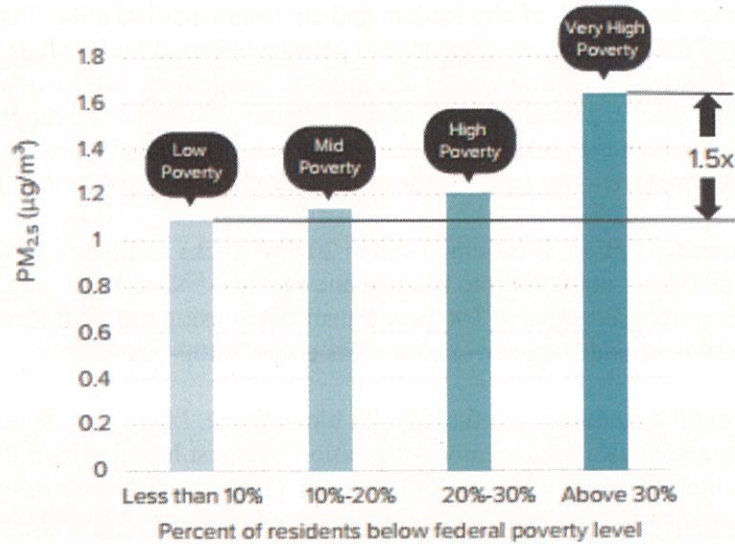
The three alternative fuel strategies discussed above — Electric, Compressed Natural Gas (CNG), and Biomethane — would enable a complete transition away from diesel. And from a public health perspective, diesel displacement deserves to be a high priority. Many studies in the U.S., Europe and beyond have documented the health risks caused by diesel emissions.

In New York City, according to the April 2017 *Community Air Survey*, “the largest share of adverse health outcomes from traffic came from trucks and buses traveling the city’s streets, accounting for more than half of PM<sub>2.5</sub>-related health outcomes from on-road traffic.” Moreover, the adverse health effects associated with diesel emissions disproportionately influence the highest-poverty neighborhoods – 1.5 times higher levels of PM<sub>2.5</sub> and 8.3 times higher rates of asthma emergency room visits as compared to affluent neighborhoods, highlighted in the figures below.<sup>12</sup>

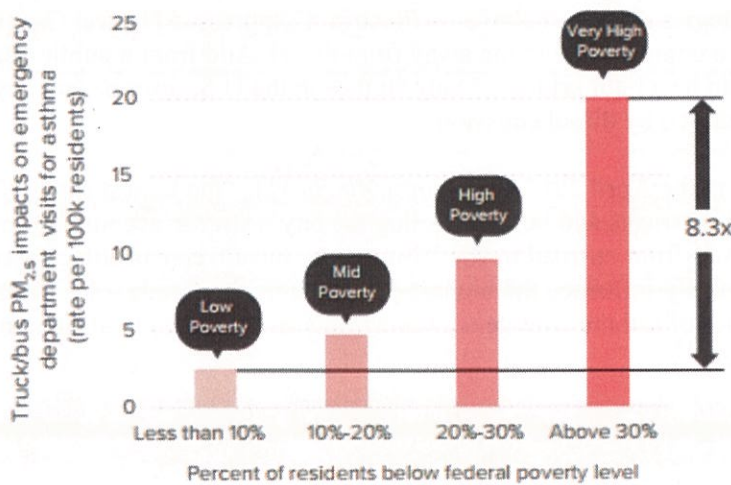
***Annual Health Impacts of Traffic-Related PM 2.5 Exposure in New York City***



### PM 2.5 Exposure in Relation to Poverty; NY Metropolitan area



### Asthma-Related Emergency Room Visits and Poverty; NY Metropolitan area



Source (3 Charts): NYC Community Air Survey, 2008-2015

Summarizing the health dangers of diesel emissions and the importance of weaning NYC fleets from use of this fuel, one of the foremost medical authorities, Dr. Philip J. Landrigan, Global Director of Public Health at Mount Sinai, has stated:

*“The air pollution produced by diesel exhaust contains potent respiratory irritants, metabolic toxins and proven human carcinogens. Diesel exhaust is a known cause of asthma, cardiovascular disease, stroke and lung cancer.*

*I strongly recommend that the City of New York eliminate all diesel trucks and buses from the City’s fleet and replace these polluting vehicles with safer, non-polluting alternatives.*

*This enlightened and visionary action will reduce rates asthma among our children. It will reduce myocardial infarctions cardiac arrhythmias and strokes among New York City’s adults. It will reduce risk of lung cancer. And because it will prevent many cases of these debilitating diseases, the elimination of diesel trucks and buses from New York City’s vehicle fleet will reduce health care costs and save the City money.”*



## Targeting Diesel Displacement: NYC’s Heavy-Duty Fleets

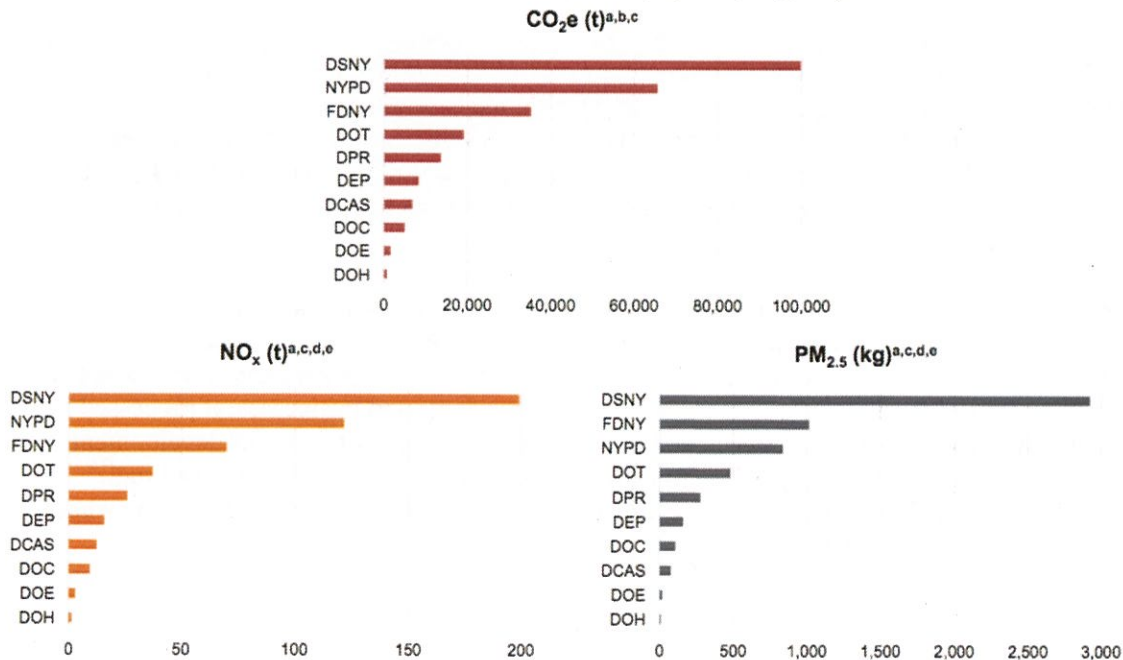
There are approximately 10,000 diesel vehicles in the City fleets, but it is the roughly 6,300 heavy-duty vehicles that demand the most attention. As illustrated in the tables below, the Department of Sanitation, with the highest number of heavy-duty vehicles, also has the highest diesel consumption (in the form of biodiesel) and accounts for the highest levels of health-threatening emissions—including of PM and NO<sub>x</sub>—despite the Agency’s widespread use of advanced emissions control systems. This clearly demonstrates a correlation between the emissions reductions that the City seeks to achieve in its 80x35 goal and the primary role played by the heaviest duty vehicles within agency fleets. Without action on these vehicles specifically, reaching the 80x35 target simply isn’t realistic.

*Heavy-Duty Vehicles, Diesel Consumption and Emissions by NYC Agencies, 2017\**

CITY AGENCY	FY 17 actual count of heavy duty vehicles	FY 17 total diesel consumption, gallons	Total estimated CO <sub>2</sub> e emissions, metric tons	As % of total emissions for these fleets	As % of required emission reduction (198,000 metric tons)
Dept. of Sanitation (DSNY)	3,808	10,198,985	103,381	63.05%	52.21%
Fire Dept. of NY (FDNY)	221	2,736,267	27,736	16.91%	14.01%
Dept of Transportation (DOT)	864	1,173,303	11,893	7.25%	6.01%
Dept. of Parks & Rec. (DPR)	354	657,500	6,665	4.06%	3.37%
NY Police Dept. (NYPD)	440	508,524	5,155	3.14%	2.60%
Dept. of Env. Protection (DEP)	439	395,086	4,005	2.44%	2.02%
Dept. of Corrections (DOC)	194	324,386	3,288	2.01%	1.66%
Dept. of Education (DOE)	24	183,003	1,855	1.13%	0.94%
<b>TOTAL</b>	<b>6,344</b>	<b>16,177,054</b>	<b>163,977</b>	<b>100.00%</b>	<b>82.82%</b>

\*Heavy-duty vehicle numbers and agency diesel consumption taken from the *Mayor’s Management Report*, September 2017; emissions values based on 22.3 lbs. CO<sub>2</sub>e per gallon diesel, per *Inventory of NYC Greenhouse Gas Emissions in 2015*, April 2017. The *Mayor’s Management Report* refers to all diesel as “biodiesel,” since City agencies have a minimum 5% blend requirement.

*Vehicle Air Emissions (CO<sub>2</sub>e, NO<sub>x</sub>, PM) by City Agency in FY 2015<sup>13</sup>*



## **Deploying Biomethane: A Cost-Effective GHG Reduction Strategy for New York City**

The table below shows examples of the greenhouse gas reductions achieved by converting 1,000, 3,800 or 5,667 trucks from diesel to biomethane (assuming a modest average per-vehicle GHG reduction of 80% compared to diesel and biodiesel blends).

### ***GHG Reduction in Heavy Duty Trucks: Three Scenarios Replacing Diesel with Biomethane***

Scenario 1	Number Trucks	Diesel Displacement (gallons/year)	GHG Reduction (MT CO2e)	% Reduction (biomethane only)	% Reduction (Biomethane + Whole Fleet)
	1,000	3,000,000	24,327.27	12.29%	45%

Scenario 2	Number Trucks	Diesel Displacement (gallons/year)	GHG Reduction (MT CO2e)	% Reduction (biomethane only)	% Reduction (Biomethane + Whole Fleet)
	3,800	11,400,000	92,443.64	46.69%	80%

Scenario 3	Number Trucks	Diesel Displacement (gallons/year)	GHG Reduction (MT CO2e)	% Reduction (biomethane only)	% Reduction (Biomethane + Whole Fleet)
	5,667	17,001,000	137,862.65	69.63%	103%

\*For the purposes of this example, all scenarios assume 10 gallons of diesel fuel consumed per vehicle per day; 22.3 pounds of GHG emissions per gallon of diesel, per the City's 2015 Greenhouse Gas Inventory; 2,200 lbs. to the metric ton; an 80% reduction of emissions relative to diesel from using biomethane; and vehicles on the road 300 days per year.

With all the environmental and public health benefits of replacing diesel trucks with those powered by CNG or biomethane, a critical question becomes: is such a shift economically feasible? The City has indicated that it plans to commit up to \$6 billion for fleet sustainability measures over 20 years.<sup>14</sup> And the good news is that the additional costs of buying trucks with Near Zero engines (about \$50,000 more per vehicle) and of properly ventilating indoor depots (approximately \$400,000 each) represents just a fraction of this amount.

For example, replacing 3,800 heavy-duty diesel vehicles with models running on biomethane (Scenario 2, above) would meet the City's 80x35 goal, at an incremental cost of \$190,000,000 spread out over 10-12 years, depending on each agency's vehicle replacement cycle. (In the case of the DSNY fleet, complete replacement could take place over 7 years, the accepted standard for vehicle replacement in that fleet since the 1980s.) In addition to distributing the costs over time, a multi-year transition would be appropriate to allow maintenance teams to become acquainted with new systems, vendors to align their operations with new city requirements, etc.

Furthermore, over the long-term the City will also likely be able to have *its own waste-streams used to produce biomethane fuel*, which has additional economic benefits. In addition to the biomethane currently produced at Fresh Kills landfill, NYC has ample supplies to produce this ultra-low-carbon fuel. As noted above, the 1.2 million tons of food waste generated by the city's residents and businesses, if processed in anaerobic digesters (including at Newtown Creek and a handful of private facilities under development in the region) could produce enough biomethane to displace ALL of the 17.6 million gallons of diesel fuel<sup>15</sup> consumed by the city's heavy-duty vehicles. But the City has 13 other wastewater treatment plants whose biogases could also be used to produce biomethane.<sup>16</sup>



*Developing and utilizing our local biomethane resource could save the City millions of dollars on fleet fuel, help address its own goal of zero waste to landfills by 2030, and provide revenue from sales of both renewable natural gas and the valuable soil amendments composed of organic waste “biosolids” left after the digestion process.*

### **Aligning the City’s Procurement Practices with Stated Climate and Clean Air Goals**

The City deserves credit for the progress made toward its *Clean Fleet* (80x35) and *OneNYC* clean air goals. Shifts of light-duty vehicles to electric models and integration of biodiesel blends fleet-wide have reduced emissions considerably, but reaching and exceeding these goals requires a major shift away from diesel fuel not yet acknowledged or embraced in the 2015 *Clean Fleet* plan. Fortunately, as described above, there are proven technologies that can get us there, and clear indicators of how to prioritize their application. Getting there, however, will require swift action.

While the City intends to pursue divestment from fossil fuel companies in its pension funds, its annual budget dedicates hundreds of millions of dollars to the procurement of diesel fuel and vehicles. The Department of Sanitation alone commits between \$50 and \$100 million each year to facility upgrades and construction. Using some of these funds to deploy proven, cost-effective non-diesel alternatives is an immediate and direct way for the City to use its buying power to drive fleet sustainability and clean air.

The City Council is now in a position to take action to align fleet purchasing with the City’s climate and clean air goals, by calling for phasing out the purchase of diesel vehicles in favor of zero and near-zero emission technologies that are available now.

Such moves are not unprecedented; London has banned the use of diesel fuel in municipal fleets, with a direct link to vehicle replacement as the most logical time to initiate this transition. Other cities across the world — from Oslo and Rome to Beijing and Shanghai — have passed legislation restricting the use of diesel vehicles, citing the fuel’s negative impacts on air quality and climate.<sup>17</sup> As the largest city in the country, and one of the wealthiest on the planet, New York has the responsibility and wherewithal to achieve its climate and clean air goals. Leadership and action on fleet procurement and introduction of zero and near-zero emission options would put our city on the path to the scale of change that assures progress toward a sustainable future for all New Yorkers.

### **Sources**

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<sup>1</sup> *NYC Clean Fleet*, December 2015. Target of 57,000 MT of emissions based on 2005 baseline of 285,000 MT. <http://www1.nyc.gov/assets/sustainability/downloads/pdf/publications/NYC%20Clean%20Fleet.pdf>.

<sup>2</sup> *Ibid.*

<sup>3</sup> *Inventory of NYC Greenhouse Gas Emissions in 2015*, April 2017. [http://www.dec.ny.gov/docs/administration\\_pdf/nycghg.pdf](http://www.dec.ny.gov/docs/administration_pdf/nycghg.pdf)

<sup>4</sup> *Ibid.*

<sup>5</sup> *NYC Clean Fleet* and the *NYC Greenhouse Gas Emissions Inventory* do not quite agree on fleet emissions. According to *Clean Fleet*, the total is 255,000MT; according to the *Inventory*, gasoline and diesel fuel combined account for 260,000MT.

<sup>6</sup> *Fleet Management Manual*, pg. 19.

<sup>7</sup> Tom Quimby, “UPS, NYC: Renewable diesel facing availability issue.” *Hard Working Trucks*, 5/9/16, <https://www.hardworkingtrucks.com/ups-nyc-renewable-diesel-facing-availability-issue/>

<sup>8</sup> Mark Boada, “Managers of Work Truck Fleets: Is Renewable Diesel in Your Future?” *Fleet Management Weekly*, <http://www.fleetmanagementweekly.com/managers-work-truck-fleets-renewable-diesel-future/>

<sup>9</sup>Boada, *op. cit.*

<sup>11</sup> [https://www.afdc.energy.gov/uploads/publication/waste\\_to\\_fuel.pdf](https://www.afdc.energy.gov/uploads/publication/waste_to_fuel.pdf)

<sup>12</sup> New York City Community Air Survey, 2008-2015, April 2017. <https://www1.nyc.gov/assets/doh/downloads/pdf/environmental/comm-air-survey-08-15.pdf>

<sup>13</sup> DCAS Clean Fleet RFI, 2015

<sup>14</sup> *Ibid.*

<sup>15</sup> Based on 19 diesel gallon equivalents per ton of food waste achieved at a combined anaerobic digester/CNG fueling facility in Sacramento, California.

<sup>16</sup> DSNY presentation on commercial food waste.

<sup>17</sup> <http://www.dw.com/en/move-is-on-to-ban-diesel-cars-from-cities/a-42747043>





**NY City Council Committee on Environmental Protection  
Preliminary Budget and Oversight Hearing  
City Hall, March 14, 2018**

*Testimony by Phil Vos, NY Program Director, Energy Vision*

I'd like to thank the Chair and the Committee for the opportunity to testify on behalf of Energy Vision, a New York-based 501(c)(3) environmental organization recognized as a leading expert on alternative fuels for heavy-duty vehicles.

This testimony addresses the Committee's work with the Mayor's Office of Sustainability in developing, implementing and overseeing Citywide sustainability policy in coordination with city agencies. Energy Vision's research has led us to the conclusion that City must align procurement policies for vehicles and fuels if it is to meet its ambitious climate and clean air goals. Simultaneously, the City should also pursue opportunities to use its own organic waste streams—primarily food scraps and wastewater—to produce ultra-low-carbon fuel for use in its own fleet vehicles.

Referring to the “existential threat” of climate change to New York, the City's 2015 *NYC Clean Fleet* document sets a laudable and ambitious goal of reducing greenhouse gas (GHG) emissions from City vehicle fleets 80% by 2035 (against a 2005 baseline). But an analysis of *Clean Fleet* shows that even its best scenario falls short of this target, since the plan fails to adequately address the reduction or elimination of diesel fuel.

*NYC Clean Fleet* sets out measures for the whole fleet, and for diesel vehicles specifically. However, when all measures are combined, total emissions reductions reach only 67%. That's close, but even that number depends on two non-diesel options that are minimized as soon as they're mentioned: greater use of compressed natural gas (CNG), which is said to face a “formidable” implementation obstacle in facility ventilation; and use of renewable diesel fuel, acknowledged to be of limited availability, though the City is piloting it. Without these options, total emissions reductions only get to 43%.

Of the City's roughly 26,000 “fuel burning” vehicles, nearly 10,000 use diesel—about 38%. But they consume 60% of all fuel and generate 63% of GHG emissions. Diesel also produces high levels of health-damaging nitrogen oxides, sulfur oxides and particulate matter. To hit its climate and clean air targets, the City must act decisively to displace diesel with zero and near-zero emission technologies. Fortunately, technology exists now to achieve these goals.

A decade of research by Energy Vision indicates that the *Clean Fleet* plan's minimization of compressed natural gas (CNG) is misguided, as CNG technology opens the door to two clean technologies that can drive both GHG reduction and clean air goals: ultra-low-emission, renewable biomethane fuel and “Near-Zero” emission natural gas engines.

There are approximately 150,000 buses, tractor-trailers and trucks across the country running on natural gas now. The technology is proven, commercial and cost effective. These engines provide the power and torque required for a range of duties; 60% of new garbage trucks sold in the country are CNG models, and DSNY has a small number of CNG trucks that collect garbage and plow snow. CNG vehicles cost only fractionally more than diesel models. CNG fueling capacity exists within New York City, including at a limited number of City-owned facilities, and the private sector is eager to build more.

Even better, any vehicle equipped to run on natural gas can also use biomethane, an ultra-low emissions renewable fuel. Made by refining the methane-rich biogas released by decomposing organic wastes (at landfills, wastewater treatment plants and in anaerobic digesters processing food waste and animal

manure), biomethane used in heavy-duty vehicles achieves GHG emissions reductions of 70% or more compared to diesel, and 40% or more compared to conventional natural gas. When it is made from food waste, biomethane can actually be *net-carbon-negative* on a life-cycle basis, which means that capturing biogas to make biomethane prevents more GHG emissions than are produced when it is combusted.

Biomethane is **being used right now** in hundreds of UPS tractor-trailers and other trucks, and in refuse trucks owned by Republic Services, Waste Management and other carters. Private haulers in Los Angeles, San Francisco and Sacramento extract biomethane from the organics they collect and use it to fuel the trucks collecting that same waste – a closed-loop model to organics recycling. The entire CNG bus fleet in Santa Monica runs on it; Los Angeles is piloting it in nearly 300 CNG buses; and in England, Bristol, Nottingham and Reading have all introduced biomethane buses.

Because organic waste materials are abundant and constantly renewed (biomethane is often called “renewable natural gas”), New York City’s own waste streams could be harnessed to produce this sustainable fuel. In fact, there are operational or in-development projects in NYC already:

- Biomethane produced at Fresh Kills landfill is being sent via natural gas pipeline to fuel buses in the Orange County Transit fleet.
- Food waste is being processed at the Newtown Creek wastewater treatment plant to generate more biogas, with plans to upgrade that gas to biomethane. This could be replicated at several of the City’s 13 other wastewater plants.
- In total, New York’s commercial food waste could produce enough biomethane to displace over 12 million gallons of diesel; combined with residential organics, we could displace all the diesel vehicle fuel the City uses, while also driving the City’s goal of zero waste to landfill by 2030.

In addition to using biomethane, heavy-duty vehicles can be fitted with readily available “Near Zero” emission natural gas engines. Certified by the California Air Resources Board and the US EPA, Near-Zero engines cut emissions of health damaging nitrogen oxides and particulate matter 90% below EPA requirements, and are 50% to 80% quieter than diesel engines. The public health benefits of these new engines would be particularly important in the often-disadvantaged neighborhoods that house many of the City’s truck and bus depots. The combination of biomethane and Near Zero engines—proven technologies that are available now—would drive the City’s GHG reduction and clean air goals.

The City spends hundreds of millions of dollars annually on procurement of diesel fuel and vehicles. Using these funds instead to deploy proven, cost-effective non-diesel alternatives leverages the City’s buying power to drive sustainability and combat the “existential threat” of climate change.

We encourage the City Council and the Mayor’s Office of Sustainability to ensure fleet and fuel purchasing align with the City’s important climate and clean air goals. Doing so means phasing out the ongoing purchase of new diesel vehicles in favor of zero and near-zero emission technologies available and deployable today.

**THE COUNCIL  
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. \_\_\_\_\_ Res. No. \_\_\_\_\_

in favor  in opposition

Date: \_\_\_\_\_

(PLEASE PRINT)

Name: DAVID WARNE

Address: 57-17 Jackson Blvd, Queens

I represent: NYC DEP

Address: \_\_\_\_\_

**THE COUNCIL  
THE CITY OF NEW YORK**

Appearance Card

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in favor  in opposition

Date: 3/14/18

(PLEASE PRINT)

Name: James Mueller

Address: 96-05 Horace Harding Expressway Corona

I represent: NYC DEP - Acting DC of BEOC

Address: SAME AS ABOVE

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THE CITY OF NEW YORK**

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in favor  in opposition

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(PLEASE PRINT)

Name: PAM ELARIDO

Address: \_\_\_\_\_

I represent: DEP

Address: 9605 Horace Harding Pkwy

Please complete this card and return to the Sergeant-at-Arms



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in favor  in opposition

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Name: Coed McMaster

Address: \_\_\_\_\_

I represent: NYC DEP

Address: \_\_\_\_\_

**THE COUNCIL  
THE CITY OF NEW YORK**

Appearance Card

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in favor  in opposition

Date: \_\_\_\_\_

(PLEASE PRINT)

Name: Angela Ricata

Address: \_\_\_\_\_

I represent: NYC DEP

Address: \_\_\_\_\_

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THE CITY OF NEW YORK**

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in favor  in opposition

Date: \_\_\_\_\_

(PLEASE PRINT)

Name: Tasos George Is

Address: \_\_\_\_\_

I represent: DEP Actg Deputy Comm. BWSO

Address: \_\_\_\_\_

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**THE COUNCIL  
THE CITY OF NEW YORK**

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 in favor     in opposition

Date: \_\_\_\_\_

(PLEASE PRINT)

Name: Comm. Vincent Sapienza

Address: 59-17 JUNCTION BLVD FLUSHING NY

I represent: NYC DEP

Address: \_\_\_\_\_

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**THE COUNCIL  
THE CITY OF NEW YORK**

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 in favor     in opposition

Date: \_\_\_\_\_

(PLEASE PRINT)

Name: DC MICHAEL DELOACH

Address: 59-17 JUNCTION BLVD FLUSHING NY

I represent: NYC DEP

Address: \_\_\_\_\_

Please complete this card and return to the Sergeant-at-Arms



**THE COUNCIL  
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. \_\_\_\_\_ Res. No. \_\_\_\_\_  
 in favor     in opposition

Date: \_\_\_\_\_

(PLEASE PRINT)

Name: PHIL VOS

Address: \_\_\_\_\_

I represent: ENERGY VISION

Address: 138 E. 13 ST. NYC

◆ Please complete this card and return to the Sergeant-at-Arms ◆

**THE COUNCIL  
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. \_\_\_\_\_ Res. No. \_\_\_\_\_  
 in favor     in opposition

Date: \_\_\_\_\_

(PLEASE PRINT)

Name: DIC JOSEPH MURIN

Address: 59-17 JUNCTION BLVD FLUSHING NY

I represent: NYC DEP

Address: \_\_\_\_\_

◆ Please complete this card and return to the Sergeant-at-Arms ◆