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MEMORANDUM

To: Mayor Michael R. Bloomberg

From: Deputy Mayor Edward Skyler ES
Chair, Energy Conservation Steering Committee

Date: December 5, 2007

Subject: Short-Term Action Plan for Reducing Energy Consumption and Greenhouse Gas Emissions of City's Municipal Buildings and Operations

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I. Introduction

On October 22, 2007, you signed Executive Order 109, which established a steering committee charged with developing and implementing a comprehensive energy conservation plan to reduce the energy consumption and greenhouse gas emissions of City buildings and operations by 30% over the next ten years. The City, which accounts for approximately 6.5% of New York City's total energy usage and 10% of its peak electricity demand, will finance the 10-year plan with an annual commitment of 10% of its annual energy expenditure.[1] In addition to the 10-year plan, which is due by June 30, 2008, the steering committee is charged with presenting a short-term action plan for the current fiscal year. The steering committee includes the Office of Operations/Long-term Planning and Sustainability, Office of Management and Budget, Economic Development Corporation, Department of Design and Construction, and Department of Citywide Administrative Services (DCAS).

Our short-term action plan includes 132 projects throughout New York City and is expected to reduce greenhouse gas emissions by an estimated 34,000 tons annually. This is an important first step toward achieving the 1.1 million ton reduction goal by 2017, and we expect to significantly improve our annual reductions when implementing the 10-year plan. The projects in this plan include lighting replacement and sensor installation; heating, ventilation, and air conditioning improvements; water and sewer

[1] The City's total Fiscal Year 2008 energy expenditure is approximately $800 million.

equipment upgrades; and vehicle replacements. The steering committee sought projects with a rapid return on investment and overall energy savings. It considered proposals developed by the DCAS Office of Energy Conservation and by several of the City's largest energy-using agencies. The steering committee also identified a series of pilot programs, studies, and advisory services to help implement these projects and to develop the 10-year plan.

The short-term action plan, detailed with current cost estimates, follows below. This $80 million plan includes $67 million for the 132 projects, $8 million for pilots, studies, and advisory services, and a contingency fund of approximately $5 million for any potential cost adjustments.

II. Short-Term Action Plan

The steering committee has approved the following 132 projects (totaling approximately $67 million) for the short-term energy conservation action plan, summarized by project type in the table below. More detailed descriptions for each project type follow the table.

NYC Carbon Footprint Reduction Projects for Fiscal Year 2008			
Project Type	**# of Projects**	**Estimated Cost**	**Estimated CO_2e Reduction[2] (tons per year)**
Interior Lighting	81	$17,032,750	10,407
Interior "Lighting-Plus"	27	$18,327,842	9,504
Heating Systems	8	$3,175,000	1,420
Street and Highway Lighting	3	$7,933,977	4,889
Vehicle Pilot	3	$1,053,240	98
Brooklyn Bridge Necklace Lighting	1	$500,000	134
Chilled Water Conversion	1	$2,000,000	837
Garage Exhaust	1	$50,000	171
Hunts Point WWTP Centrifuge Upgrade	1	$1,500,000	130
Owls Head WWTP Engine Generator Conversion	1	$4,500,000	2,260
Rikers Island Co-Generation	1	$3,800,000	1,667[3]
Rikers Island Laundry Water Recycling	1	$1,800,000	1,500
Variable Transformers	1	$360,000	410
Vehicle Replacements	1	$5,000,000	550
Videoconferencing	1	$100,000	15
Totals	**132**	**$67,132,809**	**33,992**

[2] CO_2 equivalent reduction amounts are estimates based on the best available information; actual CO_2 equivalent reductions will be tracked as part of the scope of each of these projects.
[3] Because this is a multi-year contract, the estimated CO_2 equivalent reduction is pro-rated to reflect the reduction expected as a result of work done this fiscal year.

A. Lighting

- **Interior lighting projects.** Among the projects, we will replace outdated ceiling fluorescent lamps with energy-saving lamps and replace incandescent lights in exit signs with light-emitting diodes to achieve permanent reductions in electricity usage. These projects are located in City facilities in each of the five boroughs, including 27 public schools, 19 police precincts, 13 sanitation district garages, four firehouses, and four municipal office buildings, including City Hall.

- **Interior "lighting-plus" projects.** We will combine lighting upgrades with a variety of supplementary measures, including the installation of occupancy sensors and premium efficient motors, as well as interactive control systems to reduce the use of artificial light during daylight hours and "quick" roll-up doors to reduce the loss of chilled or heated air from garages. These projects are located in buildings throughout the five boroughs, including the St. John's Recreation Center, New York Botanical Garden, and City University of New York.

- **Brooklyn Bridge necklace lighting project.** We will replace 100-watt mercury vapor lamps with 24-watt LED lamps on the Brooklyn Bridge. This project will use new technology and will mark the first such installation in the City by the Department of Transportation (DOT).

- **Street and highway lighting projects.** We will replace approximately 25,000 bulbs on City streets and highways, including over 10,000 bulbs in cobra head street lamps in Staten Island. These projects will include reducing wattage levels by replacing 250-watt luminaries with 150-watt luminaries.

B. Heating, Ventilation, and Air Conditioning

- **Heating system projects.** Among the projects, we will replace steam traps, install new control valves, and upgrade boilers in multiple municipal office buildings in lower Manhattan. In addition, we will upgrade the chiller in the Police Department's (NYPD's) forensic investigation division laboratory with more efficient motors and improved controls.

- **Rikers Island co-generation project.** We will combine the production of electricity and heat in one Department of Correction (DOC) facility on Rikers Island. This project is the initial phase of a multi-year initiative.

- **Chilled water conversion project.** We will replace local air conditioning units in several public halls at the American Museum of Natural History with a central chilled water system. This project builds upon a series of strategic energy savings initiatives that the Museum has conducted over the past five years.

C. *Water and Sewer Equipment*

- **Hunts Point Waste Water Treatment Plant centrifuge upgrade.** We will replace a centrifuge at the Department of Environmental Protection (DEP) Hunts Point Waste Water Treatment Plant with more energy-efficient equipment. The upgrade will serve as a pilot project for centrifuge replacement and may lead to the replacement of all 53 centrifuges in the City's water system.

- **Owls Head Waste Water Treatment Plant engine generator conversion project.** We will use digester gas as an energy source at the DEP Owls Head Waste Water Treatment Plant, reducing the plant's dependence on the City's power grid. The digester gas that is produced by the plant will be cleaned for use through chilling, reducing greenhouse gas emissions.

- **Rikers Island laundry water recycling project.** We will upgrade the laundry system at a DOC facility on Rikers Island to filter and reuse hot water for multiple rinse cycles. The project will reduce the amount of energy used to heat water each day.

D. *Vehicles*

- **Vehicle replacement project.** Based on the results of a study currently underway at DCAS on the 27,000 vehicles in the municipal fleet, we will replace approximately 200 of the most outdated and heaviest-polluting City vehicles with current-year hybrid vehicles. Through the project, the existing, older model gasoline sedans and sport utility vehicles (SUVs) will be replaced with the Toyota Prius and Ford Escape hybrids at the following agencies: DOC, Fire Department (FDNY), NYPD, Department of Sanitation (DSNY), DCAS, DEP, Department of Health and Mental Hygiene, Department of Parks and Recreation (DPR), and DOT.

- **Vehicle pilot projects.** For the first time, we will provide NYPD and FDNY with hybrids to be used as emergency response vehicles, and both the NYPD and the FDNY will pilot ten GMC Yukon vehicles in place of other SUVs. Additionally, for the first time DSNY will pilot three hybrid collection trucks, serving as alternatives to the traditional diesel-powered trucks.

E. *Other*

- **Variable transformers project.** We will install variable transformers at 30 DPR buildings throughout the City. Variable transformers, which DPR previously has piloted successfully, control the voltage entering a building, eliminating electricity spikes, and reduce overall electricity use.

- **Garage exhaust project.** We will install variable frequency drives in garage exhaust systems at the American Museum of Natural History to measure carbon

levels in the air. The ventilation systems, which currently operate at their highest capacity, will be modified to reduce the fan speed to match the required carbon level control required.

- **Videoconferencing pilot project.** We will install 10 videoconferencing terminals in agency offices throughout the City, aiming to reduce vehicular travel for routine meetings. The project will include a study that will measure the impact on vehicle travel by monitoring the use of the equipment.

F. Pilot Programs, Studies, and Advisory Services

- **Energy audit pilot program (cost: $1.5 million).** Through a pilot program of full energy audits in at least 10 City-owned buildings, we will assess the current energy consumption of each building, produce site-specific reports that describe and analyze the facilities and their energy consumption systems, and recommend energy conservation measures, ranging from retro-fitting or retro-commissioning to operations and maintenance improvements. Each audit will include interviews with facility managers and staff, inspections of building systems, data analysis, and specific recommendations detailing the benefits, costs, and payback for each energy conservation measure. We will review a variety of buildings based on energy usage, function, and location for the pilot.

- **Operations and Maintenance study (cost: $1 million).** We will conduct a study that focuses specifically on the operations and maintenance practices of the City's largest energy-using agencies. As part of the study, we will examine existing practices at these agencies and make recommendations for improved standards and protocols to be implemented across each agency's building portfolio. The study will include assessments of current conditions at these agencies' facilities and their impact on energy costs, as well as analyses of best practices adopted by other large municipalities, institutions, and organizations.

- **Energy management system pilot program (cost: $2.5 million).** In this pilot, we will install the hardware and software required to track energy consumption in at least 10 City-owned buildings on an ongoing basis and measure the need for, and impact of, energy conservation measures. Additionally, we will assess the effectiveness of the various types of management systems to assist us in making recommendations for broader implementation in the 10-year plan. The pilot will include more complex systems, such as full building automation systems, which provide comprehensive real-time monitoring of all types of energy in a building, as well as less complex systems that monitor specific types of energy use at a facility. The program will include a cross-section of City-owned buildings.[4]

- **Database Design (cost: $1 million).** Given the importance of collecting, monitoring, and analyzing information related to the City's energy consumption

[4] Some of these buildings may overlap with the buildings selected for the energy audit pilot program.

and conservation, the steering committee has approved the creation of a database system to integrate energy consumption data recorded by systems throughout the City's building portfolio. The system will include real-time metering and monitoring tools and will allow us to identify savings opportunities, establish priorities for energy conservation funding, and track the results of energy conservation measures that are implemented. To design the database, we will examine existing City energy data applications, review available technology, interview primary users, and assess the best practices of other entities with large portfolios and database tools.

- **LEED EB pilot program (cost: $500,000).** Through this pilot program, we will apply the nationally-recognized Leadership in Energy and Environmental Design for Existing Buildings (LEED EB) standard to at least five City-owned buildings. The LEED EB standard provides a comprehensive approach for building operators to improve energy efficiency practices, as well as site maintenance, water conservation, waste prevention, and indoor environmental quality. We will assess the feasibility and effectiveness of applying the rating system and make recommendations for the City's building portfolio.

- **Small-scale renovations study (cost: $50,000).** We will review the impact of small-scale renovations that occur routinely in City-owned spaces and that often result from staffing changes, organizational moves, and similar events. We also will examine the City's existing standards for renovations to achieve greater uniformity and compliance across project types at all agencies, and we will produce a set of common standards for all renovation projects Citywide.

- **Vehicles study (cost: $615,000).** This study will build on DCAS's current analysis of the City's 27,000-vehicle fleet, evaluating various types of alternative fuels and new vehicle technologies. The study will focus on agency-specific fleet management needs and plans, including vehicle retirement schedules, and will produce recommendations for maximizing fleet-based greenhouse gas reductions at the agency level.

- **Technical advisory team (cost: $1 million).** To help develop and implement the City's 10-year plan, we will assemble a technical advisory team with the requisite expertise and experience that will assist with the following: coordination of the energy pilots and studies described above; analysis of the applicability of advanced technologies; research on the best practices of other large entities with extensive building portfolios; evaluation of appropriate reporting, accountability, and enforcement policies; recommendations to meet procurement, staffing, and other organizational needs; assessment of alternative energy service companies; and implementation planning.[5]

[5] The technical advisory team will help review additional small-scale technology pilots for consideration this fiscal year.

III. Conclusion: Toward the 10-Year Plan

By June 30, 2008, the steering committee will present a comprehensive plan to achieve the full 30% reduction in greenhouse gas emissions by 2017. We will build on the energy pilots and studies begun this fiscal year, extending them where necessary. The 10-year plan will include the following: benchmarking of energy consumption for all City buildings; identification of existing resources for plan integration; assessment and prioritization of energy-saving technologies; timetable for procurement and implementation; measurement and verification protocols to monitor progress and energy savings; establishment of accountability and enforcement policies for agencies; and organizational recommendations required for implementation.