

## Clean Air Communities



***Clean Air Communities (CAC) is a nonprofit organization committed to achieving environmental justice by implementing air pollution reduction and energy efficiency strategies in communities that are disproportionately affected by air pollution.***

Over the past seven years, Clean Air Communities and its partners have invested \$13.6 million in projects that provide tangible air quality and energy efficiency benefits to local neighborhoods across New York City. The fifteen completed projects have also pioneered technologies and strategies that can be applied throughout the region and exported to cities across the country. For its groundbreaking partnership approach and impressive benefits to the community and the environment, CAC was honored with the U.S. Environmental Protection Agency's *Clean Air Excellence Award* in 2002 and with one of the first *Environmental Excellence Awards* by the New York State Department of Environmental Conservation in 2005.

CAC was established in 1999 as a collaboration of Northeast States Center for a Clean Air Future (NESCCAF), Natural Resources Defense Council, and New York State Department of Environmental Conservation. Startup funding of \$5 million came from Consolidated Edison Company, and in 2003 New York Power Authority donated \$2 million to initiate the Queens Clean Air Project in the Borough of Queens.

The sponsors' initial investment has achieved significant benefits for the community, the donors, and CAC. The projects have attracted \$6.6 million in additional funding, garnered important community support and media attention, and will achieve lifetime air pollution reductions of approximately 320,000 tons. The success of our projects led to a \$250,000 grant from the U.S. Environmental Protection Agency in late 2006 to work with community groups in the Waterfront South neighborhood of Camden, New Jersey, to reduce air toxics through education campaigns and clean diesel projects. That grant has attracted \$500,000 in supplemental funding from the New Jersey Department of Environmental Protection to retrofit all the diesel vehicles and equipment owned by the South Jersey Port Corporation.

With these projects, CAC has pioneered new technologies and built a diverse coalition of partners—including neighborhood activists, community development corporations, private companies, environmental regulators, and elected officials—with a mutual interest in reducing urban air pollution and improving energy efficiency. Furthermore, these initiatives provide a blueprint for other communities and groups seeking effective ways to improve energy efficiency, air quality, and public health.

The attached case studies demonstrate the success of the sponsors' partnership with CAC, which was summarized by Kevin Burke, President of Con Ed, at a press event in 2003: "All of us have a vested interest in ensuring that the air is healthy—for us, our co-workers, our neighbors, friends, and children. Public-private partnerships like this can make our communities an even better place to live, neighborhood by neighborhood."

## Pioneering Energy-Efficiency Projects

### CLINTON HILL APARTMENT OWNERS CORPORATION Microturbine Cogeneration

In June 2006 the Clinton Hill Apartments in the Fort Greene neighborhood of Brooklyn, New York, completed ***the largest installation of advanced microturbine cogenerating units serving a residential complex***. Fueled by clean-burning natural gas, the 13 units generate 600 kilowatts of electricity as well as hot water for 7 of the 12 buildings. These dual-purpose units will reduce Clinton Hill's energy usage and costs by 40 percent and also enable the summer shutdown of four nearly 60-year-old heavy residual oil burners used to produce hot water.

The project is an important part of a coordinated effort to restore the moderate-income, minority Clinton Hill-Fort Greene community to a bustling, economically vital neighborhood. The 1,221 units in the Clinton Hill Apartments were originally built to house personnel for the old Brooklyn Navy Yard and became rental property when the base closed in 1966. In 1982 the apartments were converted to cooperatives, and today 60 percent are owner-

occupied, with most of the rest inhabited by rent-stabilized tenants. As part of a refinancing plan, the complex is under-going major renovations, including a substantial electrical, heating, and roofing upgrade.



*Members of the community and project partners join Brooklyn Borough President Marty Markowitz, CAC Director Debbi Edelstein, Clinton Hill Apartments Board President John Dem, and NYSERDA President Peter Smith at the inauguration.*

Clinton Hill Apartments' board of directors was interested in the cogeneration technology for a number of reasons: it offers clean, reliable energy; long-term cost control that helps maintain housing affordability; and improved air quality. The last was especially important, as the NYC Department of Health has identified the Fort Greene area as having one of the highest rates of asthma in the nation, at nearly 13 percent. Switching from the oil-fired boilers to clean cogeneration and reducing the use of oil by up to 300,000 gallons a years significantly reduces both air toxics that contribute to respiratory illnesses and ozone precursors that contribute to global warming.

Community support for the project was strong from the outset, as for eight years Clinton Hill Apartments had worked with the Myrtle Avenue Revitalization Project to educate the community about quality-of-life issues. The project received endorsements from elected officials, such as Brooklyn Borough President Marty Markowitz and State Senator Velmanette Montgomery, and from community, educational, and environmental groups, including Pratt Area Community Council, New York Public Interest Research Group, and Pratt Institute.

### ***Funding***

Total Project Cost: \$2,082,000

CAC Funding: \$465,000

Co-Funding: \$1,517,000 Clinton Hill, NYSERDA

In-Kind Contributions: \$100,000 KeySpan Energy, Energy Spectrum, Rand Engineering, Capstone Microturbine/UTC Power

### ***Technology***

The system generates heat and power using 13 Capstone/UTC natural gas-fired microturbines (seven 60kW and six 30Kw) certified by the California Air Resources Board. Each unit is roughly the size of a refrigerator. The project demonstrated the feasibility of the system for older, large-scale residential complexes and proved its cost-effectiveness, as the energy savings repays the capital costs in approximately four years.

### ***Benefits***

The more efficient system reduces overall energy use and costs by approximately 40 percent. By burning 200,000-300,000 fewer gallons of No. 6 oil each year, the system reduces emissions of nitrogen oxide by 5-8 tons, sulfur dioxide by up to 2 tons, and achieves meaningful reductions in particulate matter and air toxics.

### ***Community Outreach***

The CHAOC board made several presentations to residents and actively engaged the wider community by enlisting the support of local groups. The Myrtle Avenue Revitalization Project conducted outreach to the commercial sector, and the Pratt Area Community Council reached out to the residential and institutional sectors via presentations and newsletters. A ribbon-cutting event, technology demonstration, and information fair for the Clinton Hill community attracted 150 participants and a number of local groups providing information about environmental issues in the neighborhood. The team responsible for designing and installing the system offered guided tours, which continued throughout the street festival after the press event.



### ***Press***

- *Broadcasts:* NY1, Brooklyn 12, CBS radio
- Max Abelson, "Clinton Hill Apartments Go Green," *New York Observer*, The Real Estate section, at [therealestate.observer.com](http://therealestate.observer.com), June 14, 2006.
- Brooklyn says 'Yo!' to microturbines, *Power: Business and Technology for the Global Generation Industry*, September 2006, p. 14.
- Roger Clark, "Clinton Hill Apartment Buildings Showcase New Energy Technology," *NY1 News*, at [ny1news.com](http://ny1news.com), June 14, 2006.
- *EnergyCentral.com* notice, at [pro.energycentral.com](http://pro.energycentral.com), June 15, 2006.
- Ruth Ford, "Do-It-Yourself Power," *Habitat*, at [habitatmag.com](http://habitatmag.com), October 2006.
- Emily Keller, "Cogeneration Technology Powers Clinton Street Co-op," *Courier Life*, at [courierlife.net](http://courierlife.net), June 19, 2006.

- Shane Miller, “Don’t Degenerate, Cogenerate: Clinton Hill Coop Goes Green,” *Queens Ledger* and *Brooklyn Downtown Star*, at *brooklyndownstar.com*, June 22, 2006.
- Tim Moran, “Microturbine project brings residents breath of fresher air,” *Real Estate Weekly*, June 14, 2006.

## GREENPOINT MANUFACTURING AND DESIGN CENTER Grid-Integrated Commercial Photovoltaic Power System

The Greenpoint Manufacturing and Design Center Local Development Corporation (GMDC) is a not-for-profit organization that rehabilitates industrial buildings to create permanent, affordable manufacturing space for small and medium-sized industrial firms in and around the Greenpoint neighborhood of Brooklyn, New York, and thereby creates high-quality, blue-collar jobs for low-income residents.

Project funding from Clean Air Communities enabled GMDC to finance the ***first installation in the Con Edison service territory of grid-integrated photovoltaic roofing systems.*** The project involved installing systems totaling 11,500 square feet of roof space on two buildings being redeveloped, one on Humboldt Street and another on Manhattan Avenue. **At the time of its completion in June 2004, it was the largest solar rooftop on a commercial building in New York City.** It was also the first installation in the nation to test a zinc bromide battery system (funded through a Department of Energy grant).



The system, built and installed by PowerLight Corporation of Berkeley, California, reduces demand on New York's power grid and improves air quality by substituting clean energy for emission-producing power generation. The system also reduces utility charges for peak power draw, reduces heating and air conditioning costs by adding roof insulation and shading, and extends the life of the roof underneath it.

At the project unveiling in 2002, Rep. Nydia Velazquez, representing New York's 12<sup>th</sup> Congressional District, praised the partners "for bringing this innovative installation to forward a healthier quality of life for Greenpoint residents. This solar project clearly addresses some of the environmental justice issues facing New York City's disenfranchised communities." GMDC's president, David Sweeny, noted that "this project demonstrates that preserving urban manufacturing can be compatible with community revitalization and environmental responsibility." He expressed the view of CAC and all the partners when he added, "We're particularly excited that we can do this in Greenpoint, which has historically been home to some of the city's worst environmental problems."

### ***Funding***

Total Project Cost: \$1,167,000

CAC Funding: \$340,000

Co-Funding: \$677,000 GMDC, NYSERDA

In-Kind Contributions: \$150,000



### ***Technology***

The project has two PowerGuard Photovoltaic Roofing Systems, covering 11,500 square feet of roof space on two buildings and producing up to 115kW under peak sunlight conditions. Each of the 805 solar tiles has a maximum output of 100 watts, and they are connected into 35 strings of 23 tiles each and connected to a Con Edison urban network distribution

system. The system uses silicon technology to convert sunlight directly into electricity; it also provides thermal insulation, thereby reducing costs for heating and cooling.

### ***Benefits***

The combined system generates enough energy during the daytime to power more than 100 homes. By avoiding the purchase of fossil-fuel generated electricity, the system will reduce emissions of nitrogen oxide by 2.3 tons, sulfur dioxide by 6.4 tons, and carbon dioxide by 1,456 tons over its 25-year life. The reduction in carbon dioxide emissions is equivalent to removing 300 cars from New York roadways, reducing the amount driven by 3.6 million miles, or planting 16 acres of trees.

### ***Community Outreach***

CAC and its partners—GMDC, PowerLight, and New York Shines—conducted outreach in North Brooklyn and citywide to raise awareness about solar power. GMDC also made formal presentations at alternative and renewable energy conferences. In October 2002 a combined ribbon-cutting ceremony attended by U.S. Representatives Carolyn Maloney and Nydia Velazquez and symposium on solar power in drew 200-300 people, many of whom live or work in the Greenpoint-Williamsburg area. Project partners have also installed a public kiosk and signage at a nearby environmental center to promote the project and its sponsors.



## **SEWARD PARK HOUSING CORPORATION Conversion to Central Steam Heating**

In November 2002 CAC and Con Edison completed a joint project to convert 40 percent of an oil-burning heating system at the Seward Park Housing Corporation in Manhattan's Lower East Side to centralized steam heat connected to Con Edison's cogeneration infrastructure. The goals of the project included increased energy efficiency and significant improvements in local air quality, which was an especially important consideration for the primarily elderly residents of the four-building, 1,728-unit complex. In addition to the direct emission reductions, the conversion also eliminated approximately 170 fuel truck deliveries and the associated diesel emissions from idling.

The new system features an underground, state-of-the-art steam metering station that enables direct access to steam that is the byproduct of Con Edison's electricity generation. Instead of burning 400,000 gallons of heavy residual oil on site each year, it connects to a transmission main distributing steam from a central generating plant that uses 50 percent natural gas to produce both electricity and steam.

To achieve maximum energy efficiency and air quality improvements, the project included an energy audit, funded by NYSERDA, which resulted in a series of control measures. Among them were replacing or repairing vacuum pumps, valves, and insulation and installing condensate heat recovery systems to preheat domestic hot water.

At the public launch of the system in June 2003, Ashok Gupta, director of air and energy programs at the Natural Resources Defense Council, noted: "This project demonstrates the enormous untapped potential for improving air quality through fuel switching and efficiency improvements. Applying this approach to similar systems throughout New York City would be great for the health of all New Yorkers, make us less dependent on imported oil, and lower energy costs."

### ***Funding***

Total Project Cost: \$1,778,000

CAC Funding: \$635,000

Co-Funding: \$1,000,000 Con Edison, NYSERDA

In-Kind Contributions: \$143,000

### ***Technology***

The underground system consists of a two key elements: a pressure-reducing station and a steam metering station. The steam for Seward Park comes off a transmission main designed to transport steam from a generating plant to the distribution system and has a pressure substantially higher than the 200 psi normally delivered to customers. The solution was a pressure-reducing station with high-flow and low-flow pipes with valves to reduce the steam from 400 to 200 psi pressure and a safety valve to protect the metering station. That state-of-the-art vortex flow metering station consists of three steam meters of differing size and offers the following features:

- Datalogging capability to record steam consumption or profile at preset intervals from 5 to 60 minutes
- Calculation of peak hourly demand.
- Pulse signal generation for use by the building management system
- Remote steam flow and trap performance monitoring.

### ***Benefits***

By replacing the burning of 400,000 gallons of residual oil with a centralized system that uses over 50 percent natural gas in a significantly more efficient manner, the project reduces emissions in and around the Seward Park complex by 29.8 tons of sulfur dioxide (SO<sub>2</sub>), 23.1 tons of nitrogen oxide (NO<sub>x</sub>), 2.7 tons of carbon monoxide (CO), 3.3 tons of particulate matter (PM), and 13,521 tons of carbon dioxide (CO<sub>2</sub>) each year. In addition, the reduced fuel oil deliveries and truck idling during fuel discharge result in annual emission reductions of 9.3 pounds of SO<sub>2</sub>, 41.4 pounds of NO<sub>x</sub>, 69.9 pounds of CO, 1.9 pounds of PM, and 7,701 pounds of CO<sub>2</sub>.

### ***Community Outreach***

A coalition of community partners joined the Seward Park Housing Cooperative, Con Edison Steam Business Unit, and Clean Air Communities in forming the Seward Park Community Organization, an advisory group charged with publicizing and demonstrating the benefits of the project. Members included Beth Abraham Health Services, The Educational Alliance, Primitive Christian Church, South Manhattan Development Corporation, and Vision Urbana, Inc. In addition to briefings and presentations to community organizations, businesses, schools, and religious institutions, the group hosted a press event with tours and demonstrations in June 2003.



## Pioneering Diesel Emission Reduction Projects

### GRAY LINE NEW YORK SIGHTSEEING / COACH USA Clean Tour Buses

Three million passengers a year ride the red double-decker buses that tour New York City, and since 2005 both tourists and residents have benefited from CAC's partnership with Gray Line New York Sightseeing (a Coach USA Company) to reduce diesel emissions in its highly visible fleet. The project began in July 2005, when CAC subsidized the conversion of the entire Gray Line fleet to ultra-low sulfur diesel fuel in advance of wide market availability. Over five months in 2006 CAC's technical partner outfitted 21 buses with advanced pollution controls that eliminate the black puff of smoke that many people associate with diesel buses. The combination of the new fuel and special filters installed as muffler replacements reduces harmful pollutants by more than 85 percent.



The city recognizes that vehicle exhaust is one of the leading causes of air pollution in metropolitan areas, and after our project began, the New York City Council passed Local Law 41, which as of January 2007 requires the installation of emission controls on all older diesel tour buses operating in the city. At a City Hall press event, James F. Gennaro, Chair of the Council's Committee on Environmental Protection, presented the project partners with an official proclamation recognizing the achievement. Also applauding the private effort to reduce pollution were Commissioner Emily Lloyd of the city's Department of Environmental Protection; Cristyne L. Nicholas, President of the city's official tourism and marketing agency, NYC & Company; and State Assemblyman Michael Gianaris; who noted: "Tourism is one of our city's most important industries. Today Gray Line New York proves that it is also a responsible corporate citizen by taking steps to improve air quality while conducting its business. Clean Air Communities deserves our thanks for making this type of progress possible." John C. Liu, Chair of the City Council's Transportation Committee, agreed: "These innovative clean vehicles are sure to make a favorable impression on visitors to our city. We will continue to encourage the use of environmentally friendly technology and hopefully inspire other industries to adopt them."

CAC is proud to support clean tourism in the city that never sleeps and to create awareness that everyone can make environmentally sound choices, not only in their daily lives, but also in how they spend their vacation dollars.

**CAC Funding:** \$450,000

#### ***Technology***

The 21 retrofitted buses use diesel exhaust filtration technology from Cummins Emission Solutions, which relies on Johnson Matthey's patented Continuously Regenerating Technology (CRT) system to trap and oxidize soot before turning it to ash. This technology is certified by the California Air Resources Board to achieve an 85 percent reduction in

particulate matter and by the U.S. Environmental Protection Agency to achieve a 60 percent reduction in hydrocarbons and carbon monoxide. The filter is installed as a muffler replacement and has a temperature and pressure monitor to alert the operator to any problem with the technology. As standard maintenance, the CRT filter needs to be cleaned once a year. To use this and other emission control devices, the vehicle must be running on ultra-low sulfur diesel fuel, with a maximum sulfur content of 15 ppm. The fuel was purchased from Sprague Energy.

### ***Benefits***

The project results in annual emission reductions of 1 ton of particulate matter (PM), 4.92 tons of carbon monoxide (CO), and 2.11 tons of hydrocarbons (HC). Over the CRT's effective life of seven years, the reductions are 7 tons of PM, 34.44 tons of CO, and 14.76 tons of HC.

### ***Community Outreach***

The press event hosted by Councilman James F. Gennaro on July 11, 2006, drew distinguished speakers and a large crowd of interested well-wishers. Among those speaking at the event were Commissioner Emily Lloyd of the New York City Department of Environmental Protection, officially representing Mayor Michael Bloomberg; Councilman John C. Liu; Assemblyman Michael Gianaris; Cristy L. Nicholas, President and CEO of NYC & Company; Tom Lewis,



President of Gray Line New York Sightseeing; Whitfield Wylie, Vice President of Cummins Metropower; and John McClellan, President and CEO of Sprague Energy. The event concluded with a Councilman Gennaro and Commissioner Lloyd conducting "clean handkerchief" demonstration of the technology, followed by and a tour of the city on a bus draped with a "Breathe Easy! Clean Air Bus" banner with all the partner logos.

To ensure that the visitors and residents are aware of the clean buses, CAC and Gray Line New York produced "Breathe Easy! Clean Air Bus" logos for placement on the rear of every bus. In addition, Gray Line New York tour guides will include information about the project in their announcements, and the tour maps distributed throughout the city contain the logo and information as well.

### ***Press***

- "Clean Air Double-Decker Buses Help the City 'Breathe Easy!' This Summer, *Thomson Micromedex Industry News Feeds* at [micromedex.com](http://micromedex.com), July 10, 2006.
- "Clean double-decker buses unveiled in NYC," *Diesel Retrofit Daily* at [dieselretrofitdaily.com](http://dieselretrofitdaily.com), July 11, 2006.
- Department of Environmental Protection, "City Introduces First Clean Fleet of Tourism Buses," [www.nyc.gov/html/dep](http://www.nyc.gov/html/dep), July 11, 2006.
- Stephanie Gaskell, "Breathe Easier with New Buses," *New York Post*, July 12, 2006, p. 17 and [nypost.com](http://nypost.com).
- Georgia Heyward, "New York Tourist Buses Are Environmentally Friendly," *The Epoch Times*, July 12, 2006, p. 1 and [theepochtimes.com](http://theepochtimes.com).

- Justin Rocket Silverman, “Grey Line buses get pollution fix,” *amNewYork*, July 12, 2006, p. 5 and *amny.com*.
- Joe Thompson, “View NYC with Clean Tourist Buses,” *Buzzle.com* and *Ezinearticles.com*, July 13, 2006.

## 7 WORLD TRADE CENTER RECOVERY Clean Construction Demonstration

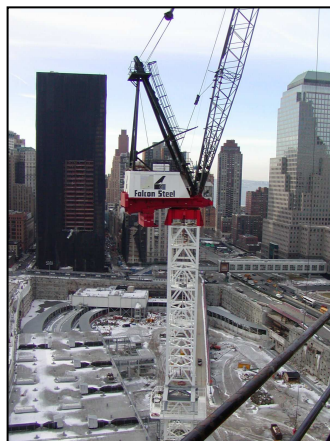
Initiated just months after the terrorist attacks of September 11, 2001, the clean construction demonstration project at the World Trade Center recovery and rebuilding site was the ***first public-private initiative in the New York construction market focused on reducing emissions from heavy-duty diesel construction equipment***. The project became a national model for both environmental innovation and effective partnerships. It prompted Governor Pataki's Executive Order requiring ultra-low sulfur diesel fuel (ULSD) and diesel emission controls for vehicles and equipment operated by state agencies working in Lower Manhattan. It is widely regarded as the impetus behind the New York City Council passing Local Law 77 requiring the use of ULSD and best available retrofit technology for all city construction projects. And it led owner Larry Silverstein to require the same clean construction practices for the entire WTC reconstruction, including the Freedom Tower.



Initiated by CAC, the project was a pioneering collaboration among city, state, and federal officials, community leaders, construction contractors, and diesel technology experts to demonstrate that significant emission reductions from heavy-duty engines are achievable at even the most difficult of construction sites. CAC provided technical support and funding to construction contractors working at 7 WTC to implement ULSD fuel use—which was not required for on-road vehicles until late 2006 and for non-road equipment until 2010—and to retrofit six pieces of equipment. The retrofits included ***the nation's first installation of advanced emission controls on a tower crane***. CAC, in partnership with Northeast States for Coordinated Air Use Management, New York State's Department of Environmental Conservation and the U.S. Environmental Protection Agency Region 2, oversaw the scientific and engineering aspects of the demonstration. Clean Air Technologies International, Inc. conducted portable emissions monitoring to record and measure real-time tailpipe emission levels.



*Installation of an active diesel particulate filter on a generator (above) and a diesel particulate filter on a tower crane (right).*



In 2002 then EPA Administrator Christine Todd Whitman wrote a letter of commendation recognizing the project and applauding Mr. Silverstein for his commitment to clean construction. In 2004 Silverstein Properties was the recipient of an environmental award from US EPA Region 2 in the business category. The project received considerable media coverage, and CAC was the subject of a CNN feature on “Cleaner Construction” at 7 WTC, in which filming was performed atop a tower crane equipped with a diesel particulate filter and monitoring instrumentation, some 40 stories above street level.

### ***Funding***

Total Project Cost: \$657,000

CAC Funding: \$397,000

Co-Funding: \$60,000 U.S. Environmental Protection Agency

In-Kind Contributions: \$200,000

### ***Technology***

The CAC team installed emission controls on six pieces of equipment. Two excavators—a large Caterpillar 245D and a small Komatsu PC-200—were retrofit with a Johnson Matthey catalytic emissions muffler. A Rudox 125 Kw generator was retrofitted with a Fleetguard diesel oxidation catalyst, using a high-performance diesel reactor substrate composed of a woven steel fiber alloy from Environmental Solutions Worldwide (ESW). The team installed a Rypos RT-500 active diesel particulate filter on a Cummins-equipped Falcon Steel generator. And the most technically challenging achievement, not least because the work occurred on a small platform 370 above the ground, was installing ESW diesel particulate reactors on two Falcon Steel tower cranes, one with a 1997 Cummins QSK 19-0 engine, the other with a Detroit Diesel GMV 12-71T engine.

### ***Benefits***

The project had unprecedented value in demonstrating and fostering the adoption of emission control technologies in the construction sector. On all levels, the project achieved its innovative goals—from the pioneering use of ULSD fuel and new technologies to the accurate monitoring of in-use equipment in a challenging site. As a demonstration of the effectiveness of the technology, the project was also a success, as the data indicate reductions of hazardous pollutants of between 30 and 90 percent, depending upon the technology.

### ***Community Outreach***

From the project inception in 2001 until its completion in 2004, CAC conducted innumerable project meetings, briefings for public officials, and press interviews.

### ***Press***

Most notable was the July 2004 CNN feature, which was filmed on June 24 and aired on July 3 and 4.



## HUNTS POINT COOPERATIVE MARKET Advanced Truck Stop Electrification

The Hunts Point peninsula occupies approximately one square mile in the southeast corner of the South Bronx and is home to the Hunts Point Cooperative Market, which is one of the largest produce and meat markets in the world. Approximately 80 percent of the New York metropolitan area's produce and 40 percent of the region's meat is shipped through the market.

Nine thousand people live in a small residential section of Hunts Point near the market and other industrial facilities, which together generate some 20,000 diesel truck trips into and out of the neighborhood each week. Hundreds of diesel vehicles idle at the market each day, and long-haul truck operators, whose trucks have large, built-in sleeper compartments and, often, refrigerated trailers, frequently idle at the market for 8-12 hours while waiting for goods or to comply with U.S. Department of Transportation rest period requirements.

Studies have shown alarmingly high asthma rates in this neighborhood, where one out of every three children is afflicted with the disease. While a direct link between diesel exhaust exposure and childhood asthma continues to be researched, both occupational and epidemiological studies provide evidence of a significant correlation between the two. This public health crisis is of paramount concern to residents of the Hunts Point community.



To reduce the impact of diesel exhaust in the neighborhood, CAC partnered with Sustainable South Bronx, New York Power Authority, and IdleAire Technologies Corporation to install an advanced truck stop electrification system in 28 parking spaces at the market. The IdleAire technology brings heating, cooling, telephone, cable TV, and internet service to the trucks' cabs and sleeping compartments through a convenient window-mounted console with temperature controls, a touch-screen display, and two

electric outlets. The system also includes a ground-mounted outlet to provide power to run the refrigerated trailers. With external electricity to power all services, drivers can turn off their diesel engines powering the truck and trailer, and thus eliminate idling and the related pollution. The system, commissioned in November 2002, was the **first commercial installation of this technology in the nation**; five years later, scores of truck stops now have this and other electrified idle-reduction technology.

"In a community like Hunts Point, finding strategies to improve air quality is truly a matter of life and death," said Majora Carter, Executive Director of Sustainable South Bronx. "The project offers a double benefit to the community by presenting an example of a technology that can improve the overall quality of life for the entire neighborhood while demonstrating a model for positive and effective residential and business community relations."

The innovative project garnered praise from US EPA Administrator Christine Todd Whitman, who delivered the keynote address at the launch event in 2001, and received the EPA Clean Air Excellence Award in the community redevelopment category in 2002.

### ***Funding***

Total Project Cost: \$1,278,222

CAC Funding: \$480,000

Co-Funding: \$605,000 IdleAire, New York Power Authority, New York City Department of Transportation

In-Kind Contributions: \$193,222 IdleAire, New York Power Authority

### ***Technology***

The IdleAire system delivers heating, ventilation, and air-conditioning to the cab and sleeper compartment by connecting the truck to an HVAC unit installed above each parking space.

A quiet, computer-controlled system links the window-mounted console and air supply/return to the HVAC device. The console also supplies 110V electric power for hooking up appliances and engine block heating. A separate, ground-mounted 220V outlet provides power for the diesel/electric units powering the refrigerated trailers.

### ***Benefits***

In its first year of operation in 2003, the project eliminated approximately 7.3 tons of pollution. Usage has increased slowly, but at full capacity over the 15-year life of the installation, the project would eliminate 6 tons of particulate matter, 318 tons of nitrogen oxides, and 321 tons of carbon monoxide.

*EPA Administrator Christine Todd Whitman examines a console during the launch event in August 2001.*



### ***Press***

- Associated Press (picked up by local publications and websites), “Trucks can stay cool while idling with device launched in Bronx,” August 7, 2001.
- “Local technology to reduce diesel truck idling,” *Knoxville (TN) News Sentinel*, August 9, 2001.
- Amy Waldman, “Truckers Get Cool Air Without Fouling the Air Around Them,” *The New York Times*, August 7, 2001.
- Sam Williams, “Stopping The Truckers From Idling at Hunts Point,” *GothamGazette.com*, November 11, 2003.



**LOCAL DEVELOPMENT CORPORATION OF EAST NEW YORK AND  
WASTE MANAGEMENT  
Urban NO<sub>x</sub> Emissions Reduction Partnership**

The Urban NO<sub>x</sub> Partnership was a unique effort initiated in 2004 by Clean Air Communities, Waste Management, Local Development Corporation of East New York, Combustion Components Associates, and ENSR International to reduce nitrogen oxides (NO<sub>x</sub>), which are a major contributor to the high amounts of ground-level ozone, commonly known as smog, in metropolitan New York. The goal of the partnership was to demonstrate an innovative emission control technology on Waste Management vehicles operating in Brooklyn and the Bronx.

The project installed ELIM-NO<sub>x</sub> technology on four vehicles and machines, including two Mack roll-off trucks, one Volvo L220 front end loader, and one 826G Caterpillar compactor. ELIM-NO<sub>x</sub> reduces NO<sub>x</sub> emissions by adding a precise amount of non-hazardous, liquid urea solution into the exhaust. The solution decomposes in the hot exhaust stream to form ammonia, which mixes with the NO<sub>x</sub> and passes through a catalytic substrate in the exhaust pipe, turning NO<sub>x</sub> into harmless water and nitrogen. For a year following installation, ENSR collected data while the engines were operating to monitor the performance of the technology and for air quality modeling. The data indicate that the technology achieved significant NO<sub>x</sub> reductions. Depending upon the type of equipment and the manner in which it was operated—such as amount of time with a full load or idling—the reductions ranged from 40 to 98.8 percent.



*Project partners at the press event and technology demonstration in May 2005.*

Ozone pollution is both an air quality and public health concern, and the adoption of proven NO<sub>x</sub> controls on diesel vehicles that travel residential and commercial streets and on pieces of industrial equipment can have a significant public benefit.

***Funding***

Total Project Cost: \$538,348

CAC Funding: \$180,000

In-Kind Contributions: \$358,348 Combustion Components Associates, Waste Management

***Technology***

ELIM-NO<sub>x</sub> uses selective catalytic reduction (SCR) technology to reduce NO<sub>x</sub> emissions from diesel exhaust without the fuel penalty associated with other NO<sub>x</sub>-reduction technologies. The installed system includes a catalyst/muffler replacement for the existing exhaust system, the urea tank and dispensing system, a cab display, and onboard monitoring for engine rpm, load, and exhaust gas to determine how much urea to inject into the exhaust stream. The urea tank is refilled by dissolving a readily available reagent in deionized water.

***Benefits***

Data collected demonstrate the success of the technology, with reductions ranging from 40 to 98.8 percent. However, it was not possible to reliably quantify the tons of NO<sub>x</sub> reduced, as two circumstances prevented a full year of monitoring. A fire onboard the 826G

compactor required that the ELIM-NOx system be removed, and a five-month Waste Management labor strike interrupted data collection.

### ***Community Outreach***

On May 4, 2005, the Urban NOx partners held a media event and live technology demonstration of the new mobile diesel emission control technology at Waste Management's facility in Brooklyn. Attending the event were representatives from organizations especially interested in air quality improvements, including U.S. Environmental Protection Agency, Environmental Defense, and the New York Metropolitan Transportation Council.

To create awareness about issues of public health, transportation, and air quality in the East New York neighborhood, community partner LDCENY, working with ENSR, held a series of meetings with local business and community audiences to communicate the message about both the causes of air pollution and potential solutions that can be adopted. The partners conducted four meetings in the summer of 2006 and presented at a trade show. In addition, LDCENY produced a "green guide" to managing asthma.

### ***Press***

- "Cleaning up at a Landfill," *Diesel Progress* (North American Edition), August 2005, pp. 52-53.
- Jim Johnson, "NYC pilot aims to cut waste equipment NOx," *Waste News*, June 6, 2005.
- Article in the *Queens Chronicle*, June 2005 (details not available)

## **ALLIANCE FOR DOWNTOWN NEW YORK**

### **Clean “Downtown Connection” Shuttle Buses**

The Alliance for Downtown New York (ADNY), which manages the business improvement district for Lower Manhattan, operates a fleet of seven free shuttle buses. The Downtown Connection connects Battery Park City on the east with South Street Seaport on the west, with stops at key destinations along the route. The buses run seven days a week from 10 to 8, except on major holidays, and are equipped with global positioning system (GPS) technology so that passengers may track the shuttles in real time via the service’s website.

In 2004 ADNY received a grant from CAC to retrofit the Downtown Connection buses with advanced diesel particulate filters, which require ultra-low sulfur diesel fuel to be effective. ADNY switched to the new fuel five months before the emission controls were installed, providing a significant clean air benefit while the technology was on order and the technical partner at work on the retrofits. The special platinum-coated, continuously regenerating filters reduce more than 85 percent of the harmful emissions from diesel exhaust.

In August 2005, less than a year after the shuttle service began, the Downtown Connection celebrated its one millionth passenger. Receiving the honor as she boarded the shuttle on her way to work, Linda Shudy Lecomte was pleased with both the \$200 gift certificate to a local restaurant and with the way both the Downtown Connection and the clean technology have improved life in her community.



*The 1 millionth rider, Linda Shudy Lecomte, celebrates with executives and staff from ADNY, CAC, and partners.*

**CAC Funding:** \$95,000

#### ***Technology***

Technology partner Cummins Metropower installed the Johnson Matthey catalyzed continuously regenerating filters (CCRT), which contain a platinum-coated catalyst and a wall-flow particulate filter. The CCRT generates nitrogen in the particulate filter, which then oxidizes and renders harmless the particulate matter (PM), carbon monoxide (CO), and hydrocarbons (HC).

#### ***Benefits***

The CCRT filter results in significant emissions reductions, including 0.26 lbs/day of HC + NO<sub>x</sub>, 6.94 lbs/day of CO, and .08 lbs/day of PM.

#### ***Community Outreach***

In addition to the press event celebrating the one millionth rider, ADNY and CAC produced a brochure about the clean shuttle service that is available on board. The initial printing of 20,000 disappeared quickly, and the brochure has now been reprinted several times. A CAC logo on the rear of every bus also announces the partnership to the area’s residents and visitors.

## **BRONX OVERALL ECONOMIC DEVELOPMENT CORPORATION**

### **Hybrid-Electric Commuter Buses**

The Bronx Overall Economic Development Corporation (BOEDC) established the Bronx Initiative for Energy and the Environment to demonstrate pathways to a greener Bronx, including energy surveys and audits, lighting and heating, ventilation, and air conditioning replacement, boiler retrofits, and green roof projects. At the top of the list is a clean vehicles program to provide a highly visible, daily demonstration of the technology and to improve air quality in the sections of the Bronx with the highest levels of pollution. Funding from CAC and other sources enabled the purchase of five innovative hybrid-electric Citibuses from Azure Dynamics, which are being delivered in May 2007.



The five 20-passenger buses will operate in parts of the community in serious need of improved transit services and cleaner air. The target areas have the lowest median income in New York City and the highest rate of asthma hospitalization and mortality in the borough. Three buses will comprise the Hunts Point Clean Air Transportation (CAT), a shuttle service for employees of companies in and around the Hunts Point Market. The remaining two buses are being leased at no cost to the Kipps Boys and Girls Club and Highbridge Community Life Center, which will each retire a van that is more than ten years old. BOEDC has secured funding to operate the buses for the first three years, and through a competitive bidding process has chosen a company to run the Hunts Point shuttle service.

#### ***Funding***

Total Project Cost: \$979,200

CAC Funding: \$340,000

Co-Funding: \$639,200 NYSERDA, New York Power Authority

#### ***Technology***

Azure Dynamics has developed a unique gasoline series hybrid-electric drive system in which the engine and motor are a single unit (a Genset) and the electric motor is the drive motor. The system features regenerative braking, automatic shut down when idling, and a top speed of 65 mph. The manufacturer's warranty is 100,000 miles on the hybrid system and battery.

#### ***Benefits***

As compared to a conventional van or bus of the same size, Azure Dynamics anticipates a 50 percent savings in fuel costs in urban driving, a 25 percent reduction in maintenance costs, and up to a 90 percent reduction in greenhouse gas emissions.

#### ***Community Outreach***

The partners are planning a series of press and community events, beginning in May 2007.

## **UNITED PUERTO RICANS ORGANIZATION OF SUNSET PARK**

### **Clean Snack Delivery Trucks**

Located in the Sunset Park neighborhood of Brooklyn, United Puerto Ricans Organization of Sunset Park (UPROSE) provides youth enrichment services, community leadership, and environmental and quality of life advocacy to a predominately Latino community disproportionately affected by air pollution. Seeking to demonstrate that low-cost technologies can be applied to reduce diesel truck emissions, UPROSE partnered with Southwest Brooklyn Industrial Development Corporation (SWBIDC) and Clem Snacks, a local food distributor, to retrofit six UTZ Potato Chip delivery trucks with diesel oxidation catalysts (DOC), an after-treatment device that configures to the existing exhaust system and reduces the amount of air contaminants by as much as 35 percent.

In partnership with Bruno GMC, CAC conducted a pilot program to determine the feasibility of retrofitting the trucks with a DOC. A combination of the pilot truck's age, wear on the engine, and poor exhaust caused the DOC to load with soot and fail. As a result, the team conducted a thorough engine and exhaust analysis of all six candidate trucks; five of the six failed the smoke opacity test, and all required extensive maintenance. During the diagnostic phase, three trucks dropped out of the program, as two were sold and the owner of the third had logistical problems.

In the end, three trucks received retrofits. Two of the three required new engines; a third was scrapped and replaced with a newer used truck that was refurbished to accept a DOC. Note that the owner-drivers of these trucks made a significant commitment to the program: while the diagnostics took only a few hours, repowering the engine to accept the retrofit took the truck out of service for several weeks. As the drivers depend on the trucks to earn their living, UPROSE covered the cost of rental trucks. Given the hurdles to success in the program, CAC is pleased that three cleaner trucks are now servicing the local community.

#### ***Funding***

Total Project Costs: \$155,000

CAC Funding: \$30,000

In-Kind and Co-Funding: \$60,000 UPROSE, SWBIDC

#### ***Technology***

Given the potential for the DOC to plug if the trucks are not well maintained, the partners decided to install Engine Control System's Purimuffler, which is a "take-apart" DOC. If the truck were to encounter backpressure issues, the inner core of the device could be easily removed by the driver and replaced with a standard muffler. A backpressure monitor was installed on each truck, with an indicator light in the cab.

#### ***Community Outreach***

CAC was one of the sponsors of the Brooklyn Air Festival on June 20, 2004, a community event conceived by UPROSE to recognize the importance of clean air and initiatives to keep the Sunset Park neighborhood clean and healthy. The sky was filled with handmade kites crafted by children and their fathers to signify the importance of clean air. On display was a retrofitted UTZ truck with the special



partnership logo, and CAC hosted a table with information about the project and a cutaway DOC for demonstration. UPROSE presented an award to Clem Snacks for its participation in the project.

To ensure project sustainability, UPROSE later conducted a workshop for the trucks' owners on proper truck maintenance and how to reduce unnecessary idling.



## Queens Clean Air Project

**“The Queens Clean Air Project is an important component in the combined effort to reduce pollution and improve health in this county. These projects help address the staggering statistics linking air pollution and diseases like cancer and asthma.”**

*Queens Borough President Helen Marshall*

The Queens Clean Air Project (QCAP) is a collaborative initiative established in 2003 to create and implement a suite of projects to reduce air pollution and improve energy efficiency in Queens. Clean Air Communities, Northeast States for a Clean Air Future, Natural Resources Defense Council, New York Public Interest Research Group, and the Queens Borough President’s Office. Funded by a \$2 million grant from the New York Power Authority, the initiative has completed five projects.

### SILVERCUP STUDIOS Green Roof

In September 2005 QCAP and its project partners celebrated the completion of the ***largest green roof in New York***, atop Silvercup Studios, which is the city’s biggest independent, full-service film and television production facility. A green roof is a carefully selected collection of soil and plants that decrease energy use by absorbing heat during the summer, thus reducing a building’s cooling costs; reduce the heat-island effect by absorbing solar energy and cooling local air through evapo-transpiration; and absorb rain that would otherwise become storm water runoff.



The primary partner, Long Island City Business Development Corporation, is a nonprofit economic development organization dedicated to promoting the economic growth and general well-being of greater Long Island City, Queens. The landscape design firm Balmori Associates served as project manager and designer, and Earth Pledge is monitoring the environmental benefits of the project.

A gala event hosted by Silvercup Studios to celebrate the achievement brought together project partners, dignitaries and celebrities, and members of community groups interested in the technology. The project has received superb media coverage, including a full-page feature in *The New York Times* on August 10, 2005; an article in the Chinese newspaper *World Journal*; and a segment with CAC staff on the BBC.



**SEAHORSE POWER COMPANY  
QUEENS BUSINESS IMPROVEMENT DISTRICTS  
BigBelly Solar-Powered Trash Compactors**

Over the summer of 2005, QCAP distributed 44 of Seahorse Power Company's new *BigBelly* solar-powered trash compactors to business improvement districts (BIDs) throughout Queens in an effort to reduce litter, promote renewable energy, and improve local air quality by reducing the frequency of trash pickups by diesel-powered garbage trucks. In the one BID with scheduled private trash-hauling service, for instance, the *BigBelly* compactors are emptied once every three days, whereas the regular trash cans are emptied once or twice daily. BID directors and their maintenance supervisors report that the compactors reduced by more than 70 percent the frequency with which staff must change and collect trash bags.



This pilot project is a resounding success, as after a year of service, the units have proven so reliable and effective that additional BIDs have clamored for the four reserved compactors. As the first large-scale demonstration of the *BigBelly*, the project attracted considerable local, regional, and national media attention; as a result, the solar trash compactors are now appearing on the streets of cities throughout the country.



*Earth Day 2005 unveiling announcement at Borough Hall. Pictured left to right: Lorna Harris, CAC; Glenn Goldstein, CAC; Evelyn Evans, NYPA; Kit Kennedy, NRDC; Borough President Helen Marshall; Jim Poss, Seahorse Power Company.*



*Before*



*After*

## DELTA AIR LINES Electric Airport Ground-Support Equipment

In October 2006 QCAP and Delta Air Lines unveiled the ***first fleet of electric ground-support equipment at the New York region's airports.*** The new equipment services the Delta Shuttle at the historic Marine Air Terminal at LaGuardia Airport. The project has permanently retired 15 vehicles (7 baggage tractors, 6 belt loaders, and 2 aircraft tractors) and retrofitted one diesel aircraft tractor with an active diesel particulate filter that removes 95 percent of the harmful soot from the exhaust. The switch to electric equipment achieves impressive reductions in both fuel consumption and harmful emissions, which are reduced by more than 98 percent. Specifically, each year the old equipment used 61,840 gallons of fuel and contributed a total of 19.2 tons of air pollution. By contrast, the electricity to power the new fleet contributes only 0.34 tons/year in emissions; eliminated are 12.4 tons of nitrogen oxides, 0.8 tons of particulate matter, 4.6 tons of carbon monoxide, and 1.4 tons of hydrocarbons. Over the service life of the fleet, the project saves 826,405 gallons of fuel and reduces emissions by 256.4 tons.



## NEW YORK CITY PARKS DEPARTMENT, ASTORIA PARK Electric Park Vehicles

As part of an ongoing initiative to create a “green” Parks Department fleet, QCAP is funding the purchase of six electric vehicles for use in Astoria Park and neighboring parks in



Queens. The new pickup trucks, utility vehicles with plows, and six-passenger car replace older gas-fueled vehicles, which will be retired. With the switch to zero-

emission vehicles, the project saves 460 gallons of gasoline a year and achieves noticeable reductions in pollutants that are harmful to human health and contribute to the formation of ozone. Adopting the technology in a high-visibility setting sets an example for other organizations and businesses and leads to expanded markets for alternative-fuel vehicles. The new vehicles will be delivered by June 2007.

## NEW YORK CITY DEPARTMENT OF SANITATION Clean Refuse Collection Trucks

In April 2006 the partners completed installing advanced pollution controls on 65 refuse collection trucks operating on residential streets in northwest Queens. The project exemplifies CAC's commitment to partnerships that create air quality and health benefits for the residents of New York's neighborhoods, who suffer from asthma rates that are among the highest in the nation.

The three innovative emission control technologies installed on the Department of Sanitation's (DSNY) fleet significantly reduce emissions of harmful particulate matter (PM), oxides of nitrogen (NO<sub>x</sub>), and hydrocarbons (HC). Each year the technology reduces PM by 0.73 tons, NO<sub>x</sub> by 1.71 tons, and HC by 4.37, achieving over the anticipated service life of the fleet a total emissions reduction of 47.7 tons. Part of the benefit derives from ultra-low sulfur diesel fuel, which DSNY began using nearly a year before the control devices were installed. DSNY was the first city agency to use the fuel in its entire fleet.

An Earth Day press event, "Clean Streets + Clean Air = Clean Communities," at the Unisphere in Flushing Meadows-Corona Park drew an impressive roster of public officials and members of the public interested in the city's continuing interest in clean vehicles.

*Celebrating the "clean handkerchief test," showing no black soot emissions from the DSNY trucks, are Queens Borough President Helen Marshall and NYC Councilmember James F. Gennaro. Background: NYC Sanitation Commissioner John J. Doherty; Joseph Leary, NYPA; Steven Levy, Sprague Energy.*

