



Department of Education

Dennis M. Walcott, Chancellor

The NYC DOE Sustainability Initiative

New York City Department of Education 2012-2013 Annual Sustainability Report





**Department of
Education**

Dennis M. Walcott, Chancellor

ACKNOWLEDGEMENTS

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United Federation of Teachers
Waste Management Inc.

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1. Preface

The New York City Department of Education (DOE) is the largest school district in the United States with over 1,700 schools, 1,200 school buildings, 137,500 employees, and 1.1 million students. Despite the overwhelming size of the school system and increasing demands on the budget, the DOE has continued to stress the importance of the implementation of sustainability initiatives. The Sustainability Initiative seeks to transform the DOE into a more sustainable and efficient public entity regarding facility operation and maintenance and student environmental education. This report highlights the developments and progress made during the 2012-2013 (Fiscal Year '13 or FY13) school year as the DOE Sustainability Initiative underwent its third year of existence.

2. Executive Summary

2.1. Overview: The primary motivation behind the DOE's Sustainability Initiative is to steer current and future generations toward a more sustainable future by providing students with a cohesive learning structure in sustainability education while also setting national standards in becoming the model operators of sustainable school facilities.

The DOE's Sustainability Initiative emphasizes four pillars of importance and goals:

- Recycling: Double the annual recycling rate by 2014 from a 2008 baseline
- Energy Conservation: Reduce greenhouse gas emissions (GHG) from DOE buildings and schools by 30 percent by the year 2017 from a 2008 baseline
- Ecology: Participate in citywide green initiatives, programs, and contests that facilitate student environmental activity and education
- Green Curriculum: Provide school principals and teachers with the necessary resources to integrate environmental education into the curriculum

2.2. Office of Sustainability: Guided by the Division of School Facilities (DSF) within the Department of Education's Division of Operations, the Office of Sustainability manages the DOE Sustainability Initiative and works year-round coordinating with many City and nongovernment agencies, to provide necessary resources to optimize school operations, so that school staff, students, and the overall community can become aware of different sustainable methods. The Office of Sustainability emphasizes four pillars in achieving sustainable success: Recycling, Energy Conservation, Ecology, and Green Curriculum. Each year, as mandated by the DOE, school principals must select one school sustainability coordinator from the teaching or administrative staff. Sustainability coordinators, with the assistance of many partners of the Sustainability Initiative, play a vital role in helping the Office of Sustainability implement its policies in the four highlighted areas of sustainability. The office provides sustainability training programs for sustainability coordinators and custodian engineers/building managers, so that they can receive proper information on implementation and facilitation of the sustainability initiatives.

- 2.3. Recycling, Organics & Materials:** The DOE fulfilled the requirements of Local Law 41 (2010) by reporting on the selection of sustainability coordinators, creating school-specific sustainability plans, and conducting an annual survey assessing the state of recycling and sustainability in schools. In January 2013, the DOE also updated Chancellor’s Regulation A-850 to clearly define the roles of the individuals involved in the Sustainability Initiative so as to avoid confusion of responsibilities. The regulation was also amended to become more inclusive of all aspects of sustainability and not just recycling as it was before. The average waste diversion rate for the DOE has increased every year with the waste diversion rate at 15.65 percent at the end of this year.
- 2.4. Energy Conservation:** Energy conservation is attained through a combination of outreach programs and building improvement projects. The DOE engages school staff and students through annual training, energy reduction competitions, as well as an annual artwork contest. Through a series of building energy audits and energy use benchmarking, the DOE is retrofitting old and inefficient equipment. Buildings receive boiler replacements, upgrades to lighting systems, and retrofits to HVAC systems to reduce energy consumption, working toward the attainment of the goal to reduce greenhouse gas emissions in DOE buildings by 30 percent by the year 2017.
- 2.5. Green Curriculum:** The Sustainability Initiative has partnered with non-profit partners such as the Children’s Environmental Literacy Foundation and Solar One to provide teachers with professional development opportunities in environmental education. Infusing the curriculum and school functions with sustainability themes helps both school staff and teachers teach students to better understand the positives associated with a sustainable and green New York City.
- 2.6. Ecology:** The Sustainability Initiative has teamed up with different ecological organizations and initiatives such as GrowNYC’s Grow to Learn Garden Initiative, the New York Restoration Project, and NYC’s Million Trees Initiative. The partnership between DOE and the various ecology initiatives and programs allows students to actively participate and learn about green and ecological methods to reuse and recycle food and recyclable materials amongst other things. Students also learn of the mutual and important relationship between humans and the environment, and how those interactions affect the environment in which we live in presently and in the future.
- 2.7. Recognition & Contests:** New York City students are dedicated to initiating and promoting sustainable issues, and as a result of their active involvement in reducing energy consumption and promoting various other sustainable practices at a high level, local and national organizations have recognized the schools and students who have contributed in making New York City a greener city to live in. The Sustainability Initiative partners with several non-profit organizations to promote sustainability issues throughout competitions with the schools and their communities.

2.8. Sustainability Survey: With the cooperation of school sustainability coordinators, the Office of Sustainability completed the annual sustainability survey, assessing the state of recycling, energy conservation, and various other sustainable practices across the DOE. The results of the survey were analyzed and are displayed in this report. There were a total of 1,452 schools that completed the survey for a completion rate of 95% of schools with sustainability coordinators. Overall, results were very similar to the findings in last year’s sustainability report indicating that schools, students, and staff have continued to implement various sustainable practices. There was a substantial increase in participation in different partner programs, such as the Green Cup Energy Challenge.

END OF EXECUTIVE SUMMARY

3. Office of Sustainability

3.1. Purpose, Goals, and Mission: Sustainability efforts are directed by the Office of Sustainability, which is housed within the Division of School Facilities (DSF). The office's purpose is to deliver the necessary resources to make all DOE school and building operations more energy efficient, increase agency waste diversion rates, encourage the incorporation of sustainability into the curriculum, and provide ecological based opportunities in the schools. Based on these four pillars of sustainability, the NYC DOE's sustainability goals are:

- Recycling: Double the annual recycling rate by 2014 from a 2008 baseline
- Energy Conservation: Reduce Greenhouse Gas emissions (GHG) from DOE buildings and schools by 30% by the year 2017 from a 2008 baseline
- Ecology: Participate in citywide green initiatives, programs, and contests that facilitate student environmental activity and education
- Green Curriculum: Provide school principals and teachers with the necessary resources to integrate environmental education into the curriculum

3.2. Structure of the Office of Sustainability: Although DSF chairs the sustainability efforts for the DOE, various other DOE divisions (such as SchoolFood and School Construction Authority (SCA)) as well as City agencies (such as the Department of Sanitation (DSNY) and the Mayor's Office of Long Term Planning and Sustainability) form a cooperative group of stakeholders. School sustainability coordinators play a vital role in the structure of the Office of Sustainability, as they are in charge of relaying information and lead sustainability efforts within their school. These various organizations and individuals play an integral part in helping to achieve a more sustainable New York City school system.

The Office of Sustainability was in transition during the 2012-2013 school year with Director of Sustainability Ozgem Ornektekin leaving halfway through the year and Dr. Sharon Jaye filling the position near the end of the school year. The Director of Sustainability manages an office of six support staff, including the Deputy Director of Sustainability, a waste management position, an energy engineer, an energy analyst, and two administrative assistants.

The following diagram (Figure 1) depicts a complete look of the stakeholders and initiators of sustainability efforts within the Department of Education.

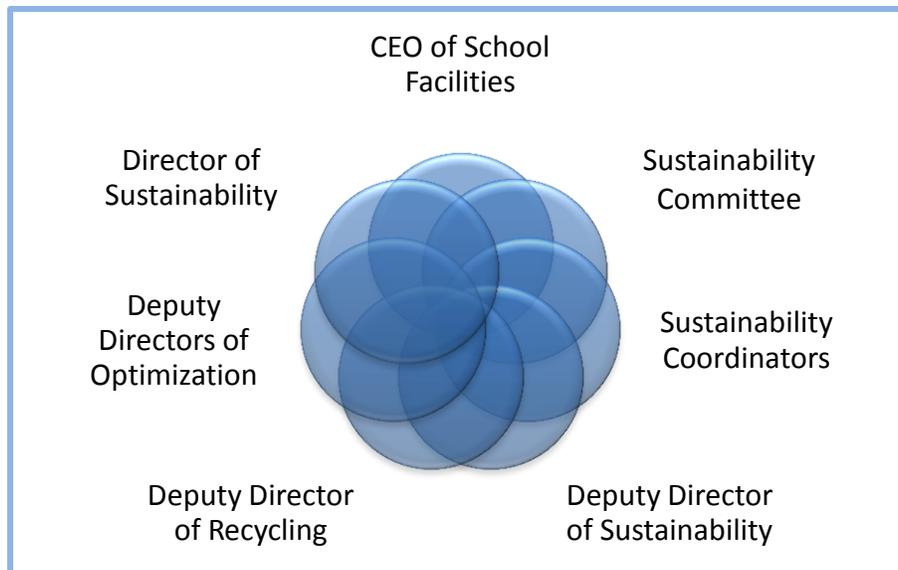


Figure 1: Organization of Sustainability Initiative Team

3.3. Update to Chancellor’s Regulation: During the school year, the Office of Sustainability undertook efforts to update Chancellor’s Regulation A-850, which details sustainability roles and regulations within the DOE. The changes went into effect January 13, 2013 and are outlined in section 4.1.3 of this report.

3.4. Sustainability Coordinators

3.4.1. Requirements: In accordance with Local Law 41 (2010) and outlined in Chancellor’s Regulation A-850 (2013), all DOE school principals must assign a sustainability coordinator from either the administrative or teaching staff. The coordinator cannot be the custodian engineer or principal. Responsibilities of the School Sustainability Coordinators:

- To develop and implement a site-specific sustainability plan which shall, at a minimum, include a school sustainability plan that follows DSNY recycling rules.
- To ensure that students are following and practicing recycling rules.
- To be the conduit for sustainable curriculum development initiatives.
- To utilize the Energy Star Portfolio Manager in assisting with energy conservation programs at the school.

3.4.2. Appointment: In accordance with Local Law 41 (2010) and Chancellor’s Regulation A-850 (2013), the Office of Sustainability created a web based application process, allowing each school principal to assign a sustainability coordinator and provide any other necessary information. Appointing a sustainability coordinator is part of the principal’s annual compliance checklist. Schools that share one school building are allowed to assign the same sustainability coordinator, however, only if all principals agree to it. This

designation of the sustainability coordinator is due the last Friday of September of each year. In the 2012-2013 school year, 1,526 schools appointed a sustainability coordinator out of 1,763 schools, for a 87 percent designation rate. The designation rate changed significantly from the previous year because charter schools were added to the total number of schools.

3.4.3. Sustainability Plan Submission: All schools under the control of the DOE, including charter schools located within DOE buildings, must create a site-specific sustainability plan summarizing the school or facility's sustainability objectives. The Office of Sustainability distributes an online application form that allows the coordinator to create and submit the plan to the DOE. Once the plan is submitted through the online form, the coordinators received a PDF copy of the sustainability plan. The plan outlines the school's plans to create a green team and set goals for recycling, energy conservation, ecology programs, and green curriculum. Once the school receives the copy, it is expected to print it out, get signatures of the principal, custodian engineer, and sustainability coordinator, and keep it on file for reference.

The school sustainability plan submission is due the last Friday of October of each year. In the 2012-2013 school year, 1,462 schools submitted a sustainability plan for a 83 percent completion rate.

3.4.4. Coordinator Training: The Office of Sustainability offers training on sustainability initiatives each year. In the 2012-2013 school year, three trainings were offered; October 11th, November 13th, and January 7th. The October 11 session was basic training for first-time coordinators, focusing on roles and responsibilities, NYC recycling rules, and partnerships offerings for further resources and training. The November 13 and January 7 sessions were more advanced for coordinators that had been to training in the past. In partnership with the United Federation of Teachers (UFT), the DOE Sustainability Initiative developed specific training sessions to cater to the four pillars of sustainability; recycling, energy conservation, ecology, and green curriculum. Many partners, including DSNY, MillionTreesNYC, GrowNYC, Solar One, *etc.*, made presentations.

3.5. Staff Training: The Office of Sustainability also provides sustainability training to other groups within the DOE umbrella. Custodian engineers underwent building operator certification training through a partnership with DCAS DEM and the City University of New York's (CUNY) Building Performance Lab. Custodian engineers and SchoolFood managers underwent recycling training. SchoolFood managers and cafeteria staff underwent energy conservation training. And All DSF facility managers underwent training on Leadership in Energy and Environmental Design for Existing Buildings Operations and Maintenance (LEED EBOM).

END OF SECTION ~ OFFICE OF SUSTAINABILITY

4. Recycling, Organics & Materials

4.1. Laws, Regulations, and Policies

4.1.1. Local Law 36 (2010): Local Law 36 of 2010 (LL 36) dictates that every New York City agency, including the DOE, shall submit a waste prevention, reuse, and recycling plan. Each City agency shall also designate a lead recycling or sustainability coordinator and each agency building should be designated one assistant sustainability coordinator.

4.1.2. Local Law 41 (2010): Local Law 41 of 2010 (LL 41), although similar in content to LL 36, specifically outlines the recycling requirements for the Department of Education. Requirements are as follows:

- All buildings owned and leased by the NYC Department of Education, including schools and administrative buildings are to recycle all recyclable materials.
- The chancellor must appoint a Director of Sustainability to oversee the recycling program, outline goals and policies to promote waste prevention, reuse, and recycling programs in all DOE Schools, charter schools, and other facilities and offices under their jurisdiction.
- All school principals must appoint a sustainability coordinator from the school staff. The sustainability coordinator cannot be the principal or the custodian engineer.
- All schools and administrative offices must prepare and submit a viable recycling plan, which at a minimum requires that every class have separate and appropriately labeled bins for trash and recyclable paper, and for school buildings to have recycling bins for metal, glass, and plastic materials as close to the school exit as possible without violating safety codes.
- The school principal or sustainability coordinator must participate in an annual survey conducted by the DOE Director of Sustainability; which helps review each school's and the City's progress on recycling activities. The Director of Sustainability must submit an annual recycling report to the Department of Sanitation.
- All primary and secondary schools that are not under the jurisdiction of the DOE, but receive department collection services must also appoint a Sustainability Coordinator and implement a waste prevention and recycling plan.

4.1.3. Chancellor's Regulation A-850 (2013): The DOE has always had a recycling policy in place before the passage of LL 36 and LL 41 known as Chancellor's Regulation A-850¹; however, the regulation has undergone multiple revisions over the years to incorporate changes that will better fit the criteria outlined in LL 41.

¹ <http://schools.nyc.gov/NR/rdonlyres/33AA3090-2BB9-47D1-A142-CA66FAC86745/0/A850.pdf>

The regulation was sent to the Panel for Educational Policy for the 2012-2013 school years to reflect current DOE organizational structure and policy. The latest revised version of the regulation was issued on January 17, 2013, with the most notable change being that the heading of the regulation was changed to “Sustainability” from “Solid Waste Management (Recycling).” The significance of this is that previous versions of the regulation were limited to information on recycling policies and guidelines, but the latest version incorporates information about energy conservation, ecology, and green curriculum; validating more of a sustainable initiative rather than just a recycling initiative.

As a result of the broadened approach taken by the DOE to different aspects of sustainability aside from recycling, another important and noticeable change to the regulation is the clarification of roles of DOE personnel responsible for implementation of the Sustainability Initiative. Responsibilities are outlined for the CEO of DSF, Director of Sustainability, Deputy Director of Recycling, Deputy Director of Energy, Principals, Custodian Engineers, and Sustainability Coordinators. The Sustainability team includes many individuals, and by having a defined organizational structure it allows for more of a clear and efficient operation.

As part of the revised version of the Chancellor’s Regulation, all school building requests from the principal that would increase the energy consumption of the building (*i.e.*, request for an air conditioner) have to be submitted to the CEO of DSF. The requests have to include equipment specific energy load information and how it complies with the energy conservation and reduction portion of the Sustainability Plan. Chancellor’s Regulation A-850 has undergone multiple revisions, but the latest and refined version is on par with the provisions in LL 41 and better rounded in relaying information on different features pertaining to Sustainability.

4.1.4. Environmentally Preferable Purchasing Laws: By accounting for factors such as energy and water use or greenhouse gas emissions, Environmentally Preferable Purchasing regulations emphasize the positive impact on human health by purchasing products that are environmentally safer than other products.

- 4.1.4.1. Local Law 118 (2005): The law mandated the creation of a Director of Citywide Environmental Purchasing to institute new purchasing standards as according to environmental guidelines. The Director must also update environmental legislative standards and submit an annual report on the City’s purchasing of environmentally sound products.
- 4.1.4.2. Local Law 119 (2005): The law reviewed current usage of energy efficient merchandise and set the water and energy efficiency minimum standards for products purchased by the City.

- 4.1.4.3. Local Law 120 (2005): The law formed the standards for acquiring products comprising of hazardous materials, while also developing regulations on reducing the volume of hazardous materials produced from the goods purchased by the City. In addition to the hazardous materials policy, the law also mandates that the City set up a plan to reuse and recycle electronic goods.
- 4.1.4.4. Local Law 121 (2005): The law revised printer default settings for City offices to print double-sided, while also establishing the minimum recycled content standards for a number of goods set by the Federal Comprehensive Procurement Guideline.
- 4.1.4.5. Local Law 123 (2005): The law established that the City of New York develop a program to evaluate the practicability of green cleaning and implement a city-wide green cleaning program by 2009.

4.1.5. New York State Green Cleaning Law: Enacted as Chapter 584 of the Laws of 2005, the State Green Cleaning Law requires elementary and secondary schools to obtain and utilize environmentally delicate cleaning and maintenance products. The New York State Office of General Services updated the law in 2010 to include state agencies and public authorities.

4.2. Recycling

4.2.1. Department of Sanitation Recycling: DSNY provides several streams of waste diversion for DOE schools. Other than organics collection (which will be talked about in a separate section), DSNY collects school recycling in two streams: Paper and Metal-Glass-Plastic-Cartons (MGPC). In order to increase the level of waste diversion in schools, DSNY provides many resources to schools, including bin labels, posters, tip sheets, and site visits, in addition to partnering with the Office of Sustainability on annual trainings for DSF, SchoolFood, and sustainability coordinators.

4.2.2. Diversion Rate Analysis: In a system as large as the DOE, with many different methods of collection, waste diversion rates are difficult to measure. DSNY calculates the DOE's diversion rate by analyzing waste that is collected through a nightly school truck collection. This route serves 927 locations, covering approximately 75% of DOE buildings. As shown in Figure 2, the waste diversion rate for the 2012-2013 school year was 16 percent.

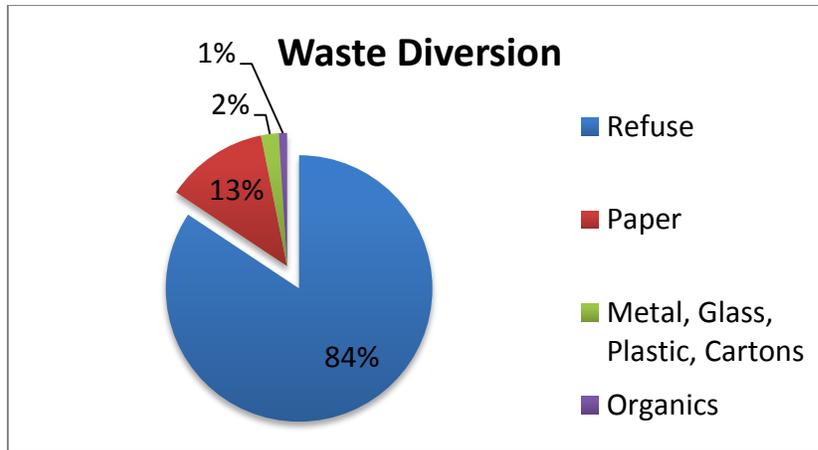


Figure 2: FY13 Waste Diversion Rate

An analysis of diversion rates over time show an average increase of 1 percent per year in the last five years, as shown in Figure 3.

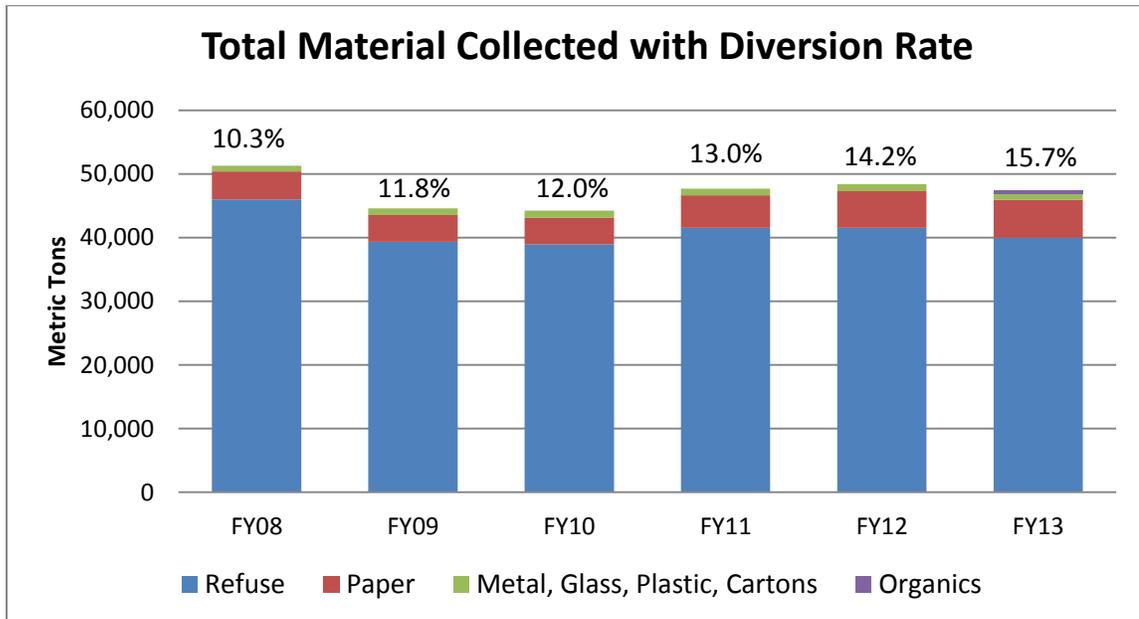


Figure 3: Waste Diversion FY07-FY13

In analyzing the waste information provided by DSNY, several other items are note-worthy. Over the last four years, the DOE has increased its footprint by 3 percent or by 4 million square feet. Simply in this fact, the DOE should have increased the amount of waste it produced in the schools. But efforts made in the school actually reduced the amount of waste produced by 11 percent. When the waste minimization rate is analyzed by square foot, the DOE actually produced 16 percent less waste. Looking specifically at the recycling waste streams and accounting for the increase in square footage, paper collection was increased by 29 percent and the MGPC collection was improved by 11 percent.

4.2.3. GrowNYC Recycling Champions Program (RCP): In the 2012-2013 school year, there were exciting changes for RCP, with the addition of five borough-specific coordinator (RCC) positions reporting to the Recycling Champions Program Manager (RCM). The RCM facilitates:

- Recycling-based professional development days for teachers and sustainability coordinators
- Annual recycling trainings for custodian engineers, sustainability coordinators, and SchoolFood managers
- A series of teacher workshops to demonstrate to teachers how recycling education can be integrated into a variety of academic subject areas
- Presentations on recycling education, best practices, *etc.* to school professionals, students, parents, and community groups

The RCCs work with school administrators and facility managers, including custodian engineers and SchoolFood managers, as well as the school sustainability coordinators and teachers, to review current recycling practices at selected schools and provide education, training and technical assistance on the proper implementation of comprehensive recycling and waste reduction practices. It is anticipated that each RCC will work with at least 20 schools each year, collectively reaching a total of at least 100 NYC public schools. RCC's technical assistance includes:

- Conducting waste audits and evaluating current recycling systems, including a review of the individual school's recycling plan as required by Chancellor's Regulation A-850 (2013) and Local Law 41 (2010)
- Assessing recycling equipment and signage needs
- Reviewing DSNY collection logistics
- Facilitating staff professional development explaining the environmental and cost benefits of recycling along with educational opportunities
- Clarifying NYC's recycling regulations and how they apply to schools
- Encouraging schools to provide community-wide recycling/reuse opportunities and education.

This year only 37 schools participated with RCP due to a delayed start of the program. In a RCP competition called the "Big Lift", 23 schools measured improvements in waste reduction and recycling over a six-week period by weighing recycling and trash produced in one day each week. RCP helped these schools increase their recycling rate by an average of 45 percent, with paper recycling rates increasing by an average of 71 percent. By the end of the competition, P.S. 154 in Queens had the highest recycling rate at 54 percent, a 268 percent increase from the baseline.

4.2.4. Trayless Tuesdays: The program, implemented in March 2010 by the DOE's SchoolFood division in association with Styrofoam Out of Schools (SOS), facilitates the reduction of polystyrene foam trays on Tuesdays by replacing them with recyclable paper boats. SchoolFood created a special and relatively dry menu suited to the proper disposal of the paper boats so that they can be recycled as paper. DOE schools use approximately 850,000 polystyrene foam trays each day. This program decreased cafeteria tray waste by 20 percent. Since the program's inception three years ago, the DOE has used almost 70 million fewer polystyrene foam trays. Certain schools have expanded the usage of paper boats to Fridays and breakfast meals, reducing polystyrene foam usage even further.

4.3. Organics Collection Pilot: In a joint initiative between the DOE and DSNY, an organics collection program was piloted in 90 schools. The goal was to collect all organic material from school cafeterias and kitchens in order to reduce the waste sent to landfills. This program was piloted in Manhattan, Brooklyn, and Staten Island, diverting 490 tons of food waste. As part of the preparation for the program, the Office of Sustainability trained SchoolFood managers, custodian engineers, deputy directors of facilities, and sustainability coordinators. On-site outreach was provided in several schools through an agreement with GrowNYC's Recycling Champions.



Organics collection required students to sort recyclables and separate food waste prior to dismissal from the cafeteria. This offered students an opportunity for measurable environmental stewardship, public scholarship, and created a platform for hands-on learning in science, technology, engineering and mathematics. All organic material was placed in special bins that were provided to schools by DSNY, and were collected five days a week in dedicated food waste trucks and transported to commercial facilities. This program required no on-site composting, and the use of these bins reduced problems with vermin.

All food scraps, soiled food service paper, and compostable trays were collected. This included vegetables, fruits, meats (including bones), dairy, fish, grains, baked goods, coffee grounds, tea bags, paper napkins, paper cups, paper plates, paper boats, and compostable pulp trays.

4.4. Plans for 2013-2014:

- Increase number of schools in the organics collection program
- Increase number of schools receiving support through GrowNYC's RCP
- Improve outreach to sustainability coordinators, SchoolFood managers, and custodians through new communication avenues
- Work with SchoolFood to identify opportunities to reduce landfill waste

END OF SECTION ~ RECYCLING, ORGANICS & MATERIALS

- 5. Energy Conservation:** As part of the of the sustainability initiatives outlined by PlaNYC² 2030, the Department of Education partners with the Department of Citywide Administrative Services Division of Energy Management (DEM) on energy conservation efforts. DEM is tasked with reducing municipal energy usage and carbon emission by up to 30 percent by the year 2017. As a result, DOE works with DEM to audit and retrofit school buildings, introduce energy efficient operation and maintenance plans, and measure and verify results. The School Construction Authority (SCA) designs new schools following green standards to maximize energy conservation efforts. The Office of Sustainability is responsible for the heat, light, and power budget for the DOE.

5.1. Energy Legislation

- 5.1.1. *Local Law 84:*** This law requires owners of all large buildings to measure the annual energy consumption (benchmarking) and submit the data to the City by a specific due date.
- 5.1.2. *Local Law 85:*** This law requires buildings to meet current energy codes for any renovation and alteration project in conjunction with local energy laws as designated by the New York City Energy Conservation Code (NYCECC).
- 5.1.3. *Local Law 86:*** All city funded capital projects with construction costs of \$2 million dollars or more must be designed to Leadership in Energy and Environmental Design (LEED) silver or higher ratings. Also, construction projects with costs at \$12 million or more must reduce energy costs by 20-30 percent below the American Society of Heating, Refrigerating, and Air Conditioning Engineers standard or NYCECC standard.
- 5.1.4. *Local Law 87:*** Buildings that are 50,000 gross square feet or larger must undergo audits and retro commissioning to determine energy consumption every ten years. The process of auditing large buildings can help lead to energy efficiency retrofits, resulting in costs and energy savings. This law helps large building owners to understand their buildings performance, which help to lead to efficient measures.
- 5.1.5. *Local Law 88:*** Large non-residential buildings are required to upgrade lighting fixtures to meet NYCECC code. Also, electrical sub-meters must be installed in large non-residential buildings to provide energy statements to the tenants of the office spaces.

5.2. Energy Analysis

DOE buildings make up 49 percent of City-owned municipal buildings, measured by square footage. Despite being such a large percentage of the City's footprint, DOE's

² <http://www.nyc.gov/html/planyc2030/html/home/home.shtml>

energy use currently only makes up 24 percent of the City’s energy usage. Despite additions of new instructional technology and air conditioning for improved student comfort over the last few years, the DOE has one of the lowest energy use intensity (MMBTU per square foot) ratings of all NYC agencies. The DOE adds multiple new schools each year (as shown in Figure 5 as net square feet) and increasingly utilizes buildings for community purposes, resulting in longer operating hours and increased building use. Buildings are used in the summer months and after school hours for instruction, community events, camps, meal service, and emergency shelters. In the summer session of 2012, 291 school buildings were used for summer school and other programs. The DOE uses four types of energy in its buildings; electricity, fuel oil, natural gas, and steam. Figure 4 shows the breakdown of energy use across the department.

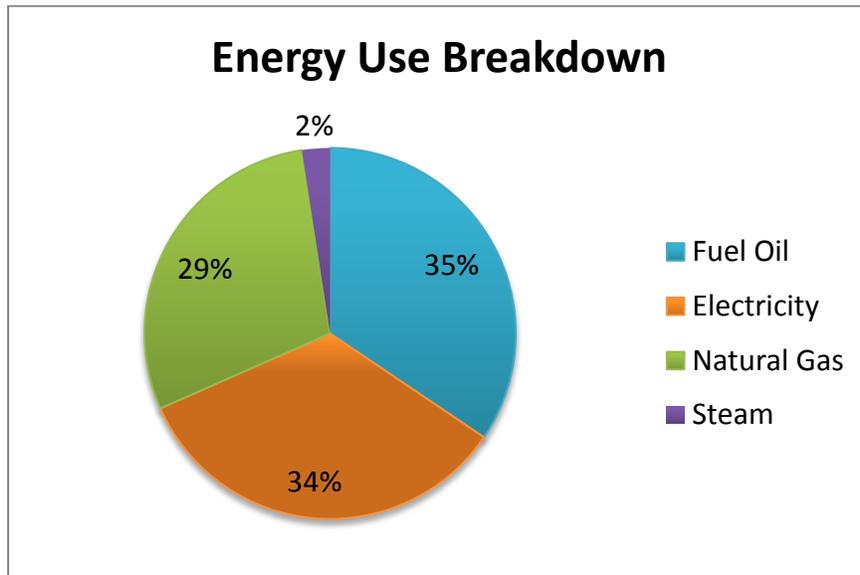


Figure 4: Energy Use Breakdown in the NYC DOE

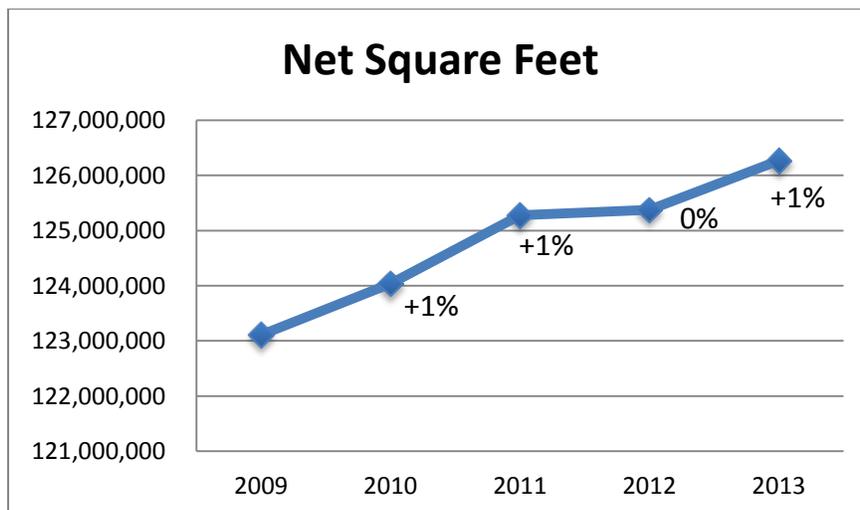


Figure 5: Net Square Footage 2009-2013

The following Figures examine the relationship between total energy use for the DOE per square foot and how weather affects energy use in the school system. Figure 6 looks at total energy use in the DOE without considering square footage or weather. The overall reduction in energy use from this viewpoint is 8 percent.

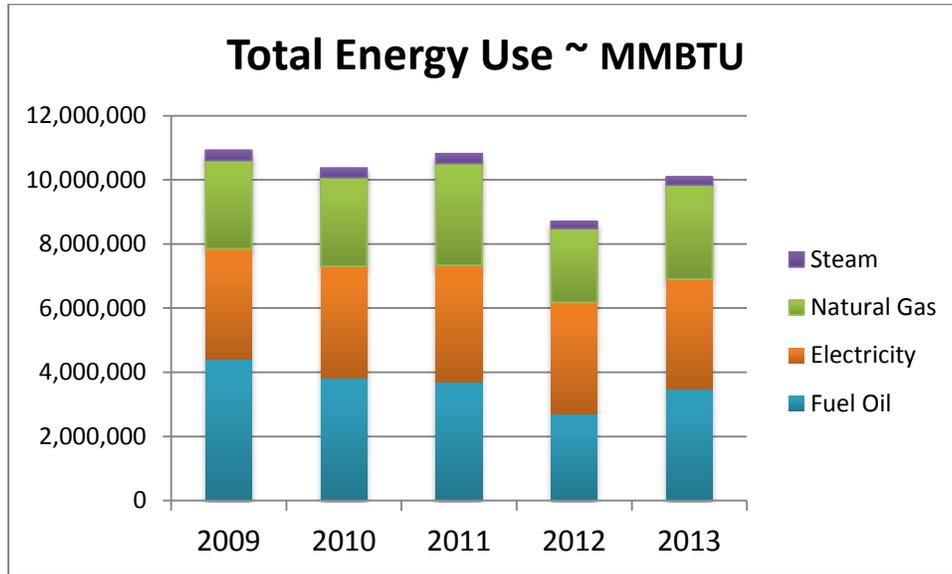


Figure 6: Total Energy Use in MMBTU

Figure 7 shows energy use by looking at BTUs per 1,000 square feet. By factoring in an additional 4 million square feet of space, and looking at energy use in BTU per net square foot, the overall reduction in energy usage is 10 percent.

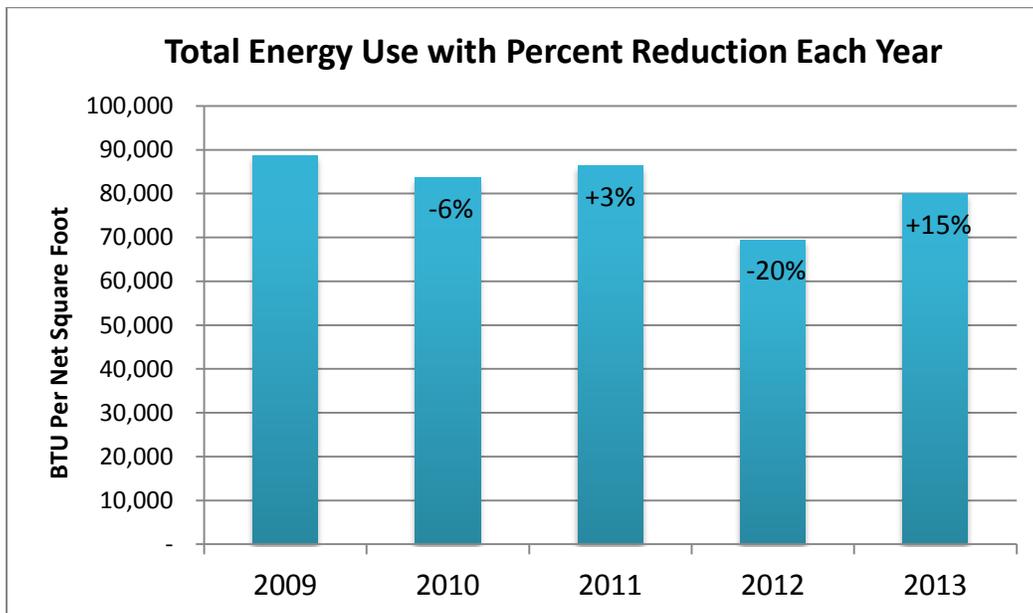


Figure 7: Total Energy Use in BTU/Net Sq. Ft.

Weather is an important factor in analyzing energy usage patterns over time. Degree days are the standardized method of determining how cold or hot the weather is on any given day. Degree days are measured by how many degrees the average temperature of the day is on either side of 65 degrees. For example, if the average temperature of a day in July was 82 degrees, the day has a cooling degree (CDD) value of 17, meaning the majority of the day was spent in cooling mode. In December, if the average temperature of the day was 45, the heating degree (HDD) value was 20, and the majority of the day was spent in heating mode. These heating and cooling degree day values are compiled on a monthly and annual basis and used in determining if energy usage patterns were influenced by the weather. Figure 8 shows the degree days for New York City from 2009 to 2013.

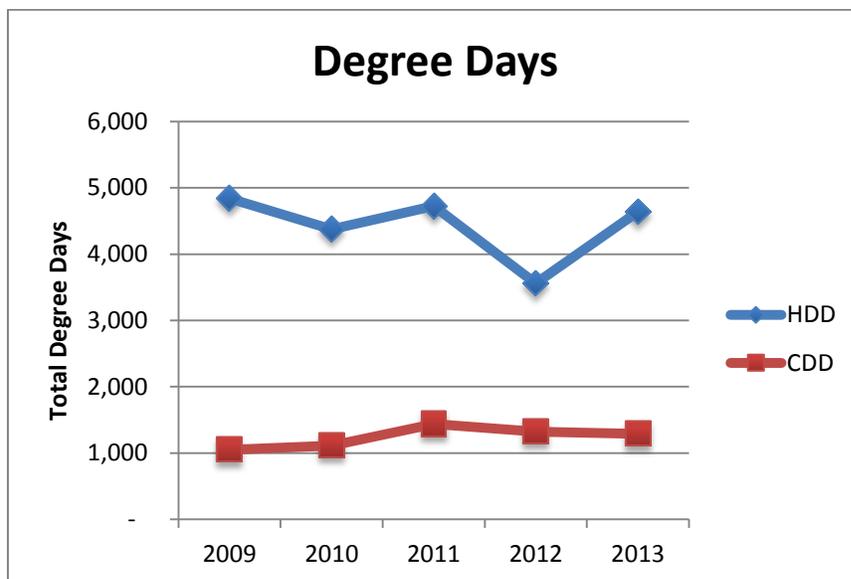


Figure 8: Heating and Cooling Degree Days 2009-2013

The next three charts (Figures 9 through 11) show the relationship between weather and energy usage, broken down by type of energy. In Figure 9, over the five year period, without consideration for square footage, electricity use in the DOE has been reduced overall by 1 percent. This was affected by weather (as shown on the chart) and increased usage of school buildings after hours and during the summer. It was also affected by an information technology improvement project performed at the school level that occurred during the 2011-2012 and 2012-2013 school years. This improvement project was estimated to add plug load of 10 percent each fiscal year to the electricity usage agency-wide.

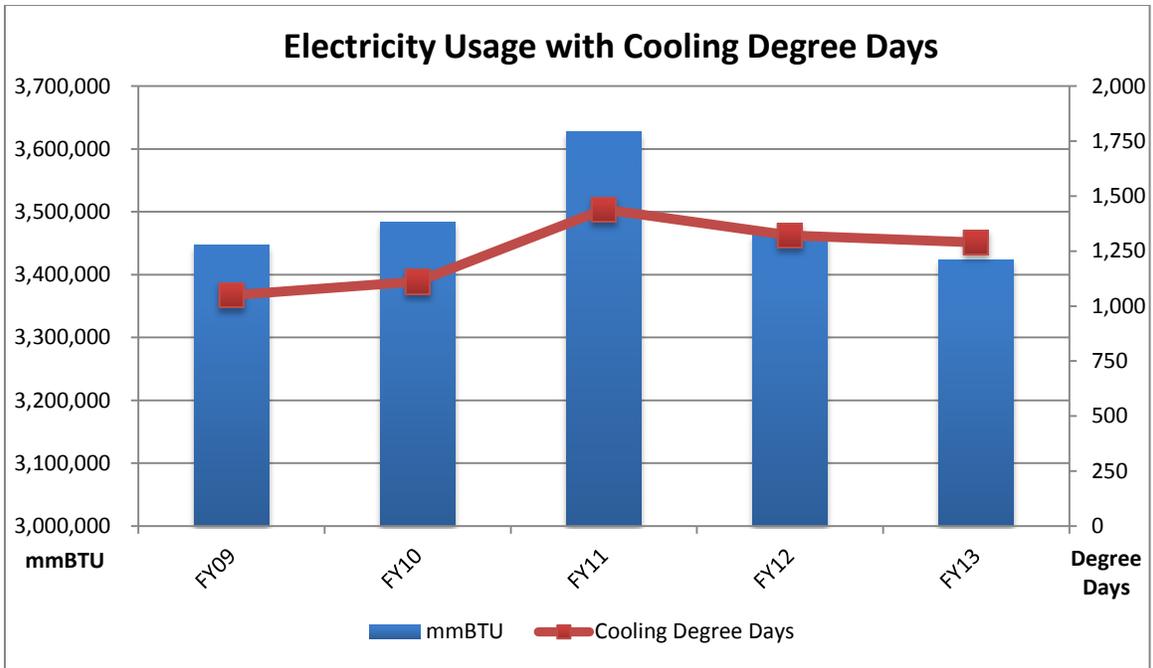


Figure 9: Electricity Usage 2009 – 2013 with Cooling Degree Days

Figure 10 shows a general trend in natural gas usage that also follows weather patterns. Another factor that has been increasing natural gas usage is the amount of boiler conversion from fuel oil to natural gas as prescribed in the clean heat program (described in more detail in section 5.10). As more conversions occur, natural gas usage will increase as fuel oil usage decreases.

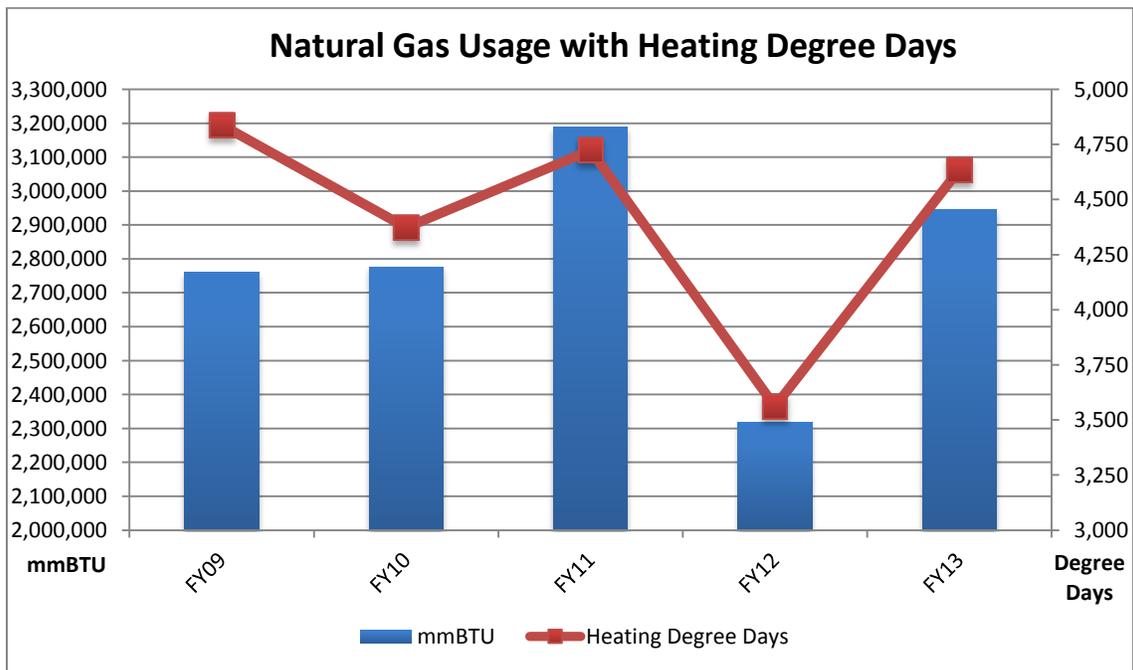


Figure 10: Natural Gas Usage 2009 – 2013 with Heating Degree Days

Figure 11 shows a similar trend in usage with fuel oil consumption following general weather trends. With the clean heat conversion projects, fuel oil consumption has been reduced 21 percent.

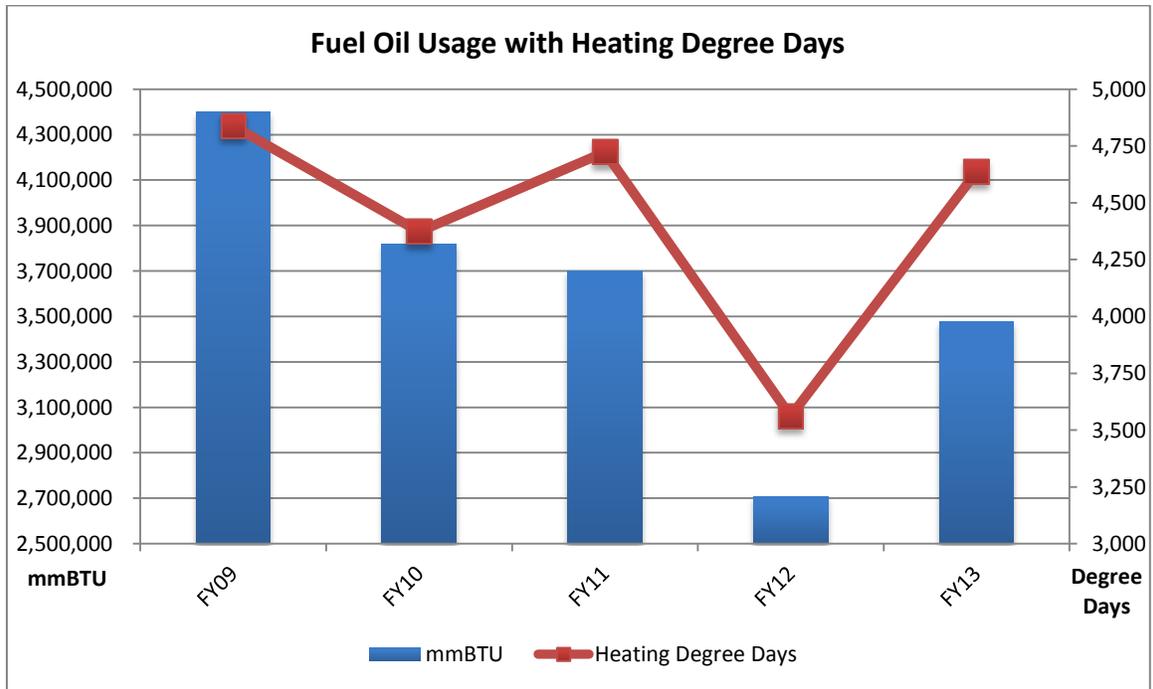


Figure 11: Fuel Oil Usage 2009 – 2013 with Heating Degree Days

5.3. Energy Team Formation: The Division of School Facilities and Office of Sustainability went through exciting changes in the 2012-2013 school year with the formalization of an energy team, funded by DEM. The team additions consisted of five deputy directors of optimization (energy managers), one energy engineer, and one energy analyst. In conjunction with the division’s energy liaison officer and maintenance, repair, and operations personnel, this team is responsible for the DOE attainment of the energy and greenhouse gas reduction goals set by PlaNYC.

5.4. Energy Benchmarking: In order to create a baseline for energy consumption at each school and DOE building, the DOE benchmarks its buildings energy usage by using the U.S. Environmental Protection Agency (U.S. EPA) Energy Star Portfolio Manager. Portfolio Manager allows for the DOE to easily track and analyze energy usage, costs, and carbon emissions. Each DOE building had been benchmarked by May 2010, but the data on energy consumption are updated monthly. Portfolio Manager also allots ratings from 1–100, with 100 being the highest, for each facility using its services. For the 2012–2013 school year, over 500 DOE schools had an energy rating of at least 75, a 33 percent increase over last year.

Students, parents, principals, teachers, and any other person associated with a school are encouraged to create a free account on the U.S. EPA’s website and request to view

their school's energy statistics. Teachers can also utilize the Portfolio Manager to perform data analyses and structure lessons on energy types and carbon emissions. All custodian engineers and building managers are given access to Portfolio Manager as part of the Building Operator Certification course.

5.5. Building Audits and Retrofits: Portfolio Manager is also used by DEM to select schools that will receive annual energy audits. The energy audits assess a school's performance in order to develop conservation measures that will help improve energy efficiency and lower costs for the DOE. The most common energy conservation measures include lighting retrofits, vacancy sensors, boiler replacements, motor replacements, chiller replacements, reconfiguring HVAC systems, *etc.*

5.6. Operation and Maintenance Initiative: New York City's Office of Long Term Planning and Sustainability (OLTPS) estimated that municipal facilities could reduce carbon emissions by 195,000 metric tons annually and save millions of dollars by just improving the operation and maintenance (O&M) of the facilities. Common O&M initiatives include the physical upkeep of building envelope, examining heating and hot water systems, ensuring proper ventilation and air flow, auditing building systems for proper operation (refrigeration, steam, controls, building automation, electrical, lighting, water distribution, heat recovery, compressed air), and monitoring equipment for efficiency (motors, drives, pumps, fans). Part of this initiative includes training the custodians and building managers in courses such as "Building Operators Certification", "Building Commissioning" and "Energy Management and Auditing".

5.7. Peak Load Management/Demand Response Program: On very hot summer days there are concerns about electrical power outages due to the higher demand on the State's and City's power grid. As a result, the DOE in partnership with the New York Power Authority (NYPA) and Energy Curtailment Specialists (ECS) work to reduce the electrical load on the days designated as peak load. The schools and DOE office buildings that are part of the demand response program curtail their energy consumption by shutting off unnecessary lights, air conditioners, and other equipment. Demand response programs are not just limited to summer days as heating demand during the winter can also create a strain on the City's energy budget, so schools and offices also curtail energy consumption on designated winter days as well. In the summer of 2012 and winter 2012- 2013 the peak management and demand response programs helped to reduce over 1,200 kilowatts, netting the DOE \$220,000 in revenue.

5.8. Plug Load Policy: Any school improvement request that would increase the energy consumption in the school must be submitted to the Office of Sustainability. The request must include all requested equipment (*i.e.*, air conditioner, smart board) and state how the usage of the equipment will be in compliance with the school's sustainability plan. The Deputy Director of Sustainability and the energy team analyze the building's energy consumption and determine whether to approve the request or not. If a request is unapproved, schools can submit detailed energy reduction plans

and policies in order to have their requests reconsidered. If the plans are acceptable and the installation is approved, members from the energy team may visit the schools to verify that the energy reduction plans are in effect. If the school is found to be noncompliant with the energy reduction plan, DSF can remove the requested equipment from the school at any time.

5.9. Energy Efficiency in Newly Constructed Schools: The School Construction Authority (SCA) is the school capital planning agency of New York City and they are committed to working with the DOE on energy conservation initiatives. The SCA performs most of the capital level energy projects, such as lighting system replacements and dual fuel boiler replacements, while DSF focuses on maintenance and operational projects, such as retro-commissioning upgrades. To guide new construction, the SCA and DOE have created the NYC Green Schools Rating System to guide sustainable design, construction and operation of new schools, modernization projects and school renovations and to achieve compliance with Local Law 86/05. This rating system is based on the U.S. Green Building Council's LEED® (Leadership in Energy and Environmental Design) Building Rating System. The NYC Green Schools Rating System includes enhancements beyond LEED, based on best practices from the SCA and the Collaborative for High Performing Schools (CHPS) rating system.

The SCA is currently in the process of constructing a new school in Staten Island that will be New York City's first net-zero energy school. Through a combination of photovoltaic solar panels, efficient design, energy efficient equipment, and strict operations and maintenance procedures, the school is designed to surpass any energy criteria that the City and SCA had set out for construction of new buildings. The DOE is looking forward to opening the school in the 2015-2016 school year.

5.10. Clean Heat Program: Over 10,000 New York City buildings burn heavy types of fuel, commonly known as No.6 fuel oil. Heavier forms of fuel oil contribute more pollution than all the vehicles in the City, deteriorating the air quality. In 2011, New York City mandated that all buildings must convert to one of the cleaner fuel types, either No.4 or No.2 fuel oil or any approved lower emission releasing fuel type by January 2030. By 2015, No.6 fuel oil will be phased out of all DOE buildings, with the intention to have all buildings converted to No.2 fuel oil by 2030. DSF is responsible for converting boiler plants from No.6 to No.4 by the 2015 deadline. The SCA has been working at a higher level of capital planning, replacing old systems with No. 2 fuel oil systems, dual fuel systems, or straight to natural gas. This initiative will help lessen carbon dioxide levels by up to one million metric tons as part of the PlaNYC target of reducing greenhouse gases by 30 percent by 2030. For more information about the program, visit Clean Heat Programs' website³.

³ <http://www.nyccleanheat.org/>

5.11. Energy Challenges: As explained in more depth in section 8.2, the Office of Sustainability partners with local non-profit organizations to run several energy competitions that the schools can participate in. For the Green Schools Alliance energy challenge in October to the Solar One challenge that runs for four months, it takes a team of people in each building to reduce energy usage. Training is offered through the organizations to building teams on what they can do during the challenge to reduce energy consumption.

5.12. Student-Led Energy Audits: As part of a 10-week, Solar One Green Career Internship program (funded by The Rockefeller Foundation), a team of four high school students from Bayside High School completed a building energy audit with the help of mentors from the New York Power Authority. As a result of the extensive audit, which included recommendations for upgrades to the HVAC systems and simple payback figures, DSF committed to fund \$60,000 in upgrades to the systems at Bayside High School. The audit was completed with a presentation by the student team and a visit to the boiler room with the contractor and custodian so the students could see the proposed project and the results of their hard work.

5.13. Water Efficiency Program: New York City's Water for the Future Program is an initiative to ensure clean, reliable, and safe drinking water for millions of New Yorkers for years to come. Part of the program is to retrofit bathroom fixtures in school buildings with up to 500 schools are expected to be retrofitted by 2018. During the summer of 2012, the NYC Department of Environmental Protection (DEP), the DOE, and SCA partnered to install high efficiency bathroom fixtures in two schools as a pilot. During the 2013-2014 school year, there are plans to retrofit an additional 23 schools. With the installation of nearly 40,000 bathroom fixtures by the completion of the retrofits, the City will save at least four million gallons of water per day.

To raise water conservation awareness in the schools that underwent bathroom retrofits, signs (such as the sign in Figure 12) will be positioned, notifying students of the newly retrofitted fixtures and their benefits as well as the benefits of water efficiency and conservation.



Figure 12: Water for the Future Signage

5.14. Plans for 2013-2014

- Improve energy team's outreach to custodians and building managers
- Work with DEM to improve quality of energy data
- Provide additional resources to schools that choose to perform student-led energy audits

- Support schools with the enforcement of Chancellor’s Regulation A-850 and the removal of personal appliances and excess plug loads.
- Create goals for water conservation and expand outreach to schools

END OF SECTION ~ ENERGY CONSERVATION

6. Green Curriculum: The Office of Sustainability has partnered with several non-profit organizations that specialize in infusing curriculum with environmental awareness and subject matters. The partnerships and their efforts are outlined below:

6.1. Solar One Green Design Lab™ (GDL): Solar One is a non-profit environmental organization that provides New York City public schools with fun and dynamic ways to incorporate information on sustainability issues, and through its Green Design Lab™ program provides a comprehensive curriculum program. Green Design Lab™ uses a unique system that incorporates science, technology, engineering, and mathematics to promote activities. Students are able to explore and research the different ways to make their schools and environment sustainable and then apply that knowledge by becoming involved in school-wide sustainability projects. A GDL coordinator helps participating schools by incorporating the green curriculum and providing technical assistance to teachers and school staff. For the 2012-2013 school year, Solar One touched 160 schools, more than tripling the previous year's participation.

6.2. Children's Environmental Literacy Foundation (CELf): In order to make sustainability education an important aspect of K-12 education, CELf provides training and educational programs for students and teachers. CELf programs utilize sustainability education to transform a school's operations, activities, physical environment, and curriculum to fit a sustainable criterion. This approach is intended to foster responsible sustainable practices and behaviors for the future. For school year 2012-2013, twelve schools were selected to be part of a year-long pilot to integrate sustainability topics to the schools' curriculum. During a two day information session for the selected schools, school staff received training in curriculum development in association with sustainability and STEM subjects (science, technology, engineering, and math). As a follow-up, CELf educators will make periodic visits to each school in the 2013-2014 school year to observe and note the changes being made so they can assess the impact of the program.

6.3. Department of Sanitation (DSNY): DSNY's Bureau of Waste Prevention, Reuse and Recycling originally created a NYC K-12 Schools Reduce-Reuse-Recycle Resource guide for teachers in 2001. The RRResource Guide was designed specifically for New York City teachers to address issues with waste that are specific to the NYC area. This year, DSNY updated the guide to align it with new learning standards being adopted throughout the school system.

6.4. Plans for 2013-2014

- Encourage more schools to participate in current green curriculum programs
- Research additional organizations that provide green curriculum support
- Work with DOE curriculum office to explore the integration of sustainability initiatives into STEM courses

END OF SECTION ~ GREEN CURRICULUM

7. Ecology

7.1. MillionTreesNYC (MTNYC) Initiative: In association with the New York City Parks Department and New York Restoration Project (NYRP), MillionTreesNYC is a publicly/privately funded program striving to plant and care for one million trees by the year 2017. Roughly 70 percent of the one million trees will be planted in public spaces like parks, and the remaining 30% in private settings. By planting one million trees, New York City will increase the number of trees on private and public land by up to 20 percent, leading to a multitude of environmental, social, health, and economic benefits. In the spring of 2013, one-hundred trees were planted at six different DOE schools in a special planting project. Members of the Brooklyn Nets also participated in a tree planting event at M.S. 51, William Alexander Middle School in Brooklyn. In addition to these special projects, trees are planted at a multitude of schools through this program in any given year.

7.2. GrowNYC's Grow to Learn: School Garden Initiative: The uniqueness of New York City is that a person has a variety of options to choose from when they want to eat or buy food. However, the downside to that is that many people do not actually know how and where their food comes from. This is compounded by the fact that diabetes and obesity related illnesses are dangerously prevalent in the City's youth. While much of the City is covered in asphalt and buildings, there is still an abundant amount of open green and park space throughout New York City, but many school children fail to connect to the natural side of the City, leading to less physical activity. In association with several governmental and private agencies to help combat health related problems, GrowNYC established the School Garden Initiative. The initiative seeks to encourage and support the creation of school gardens at every DOE school.

Grow to Learn facilitates the development of school gardens by providing mini-grants worth up to two-thousand dollars so schools that do not have the funds to start a garden can do so. In addition to monetary support, schools that register with Grow to Learn are provided with the necessary material, instructional, and educational support. The creation of a school garden facilitates physical activity as students are actively involved in the gardening process. It exposes students to soil, water, and weather processes related to growing plants and it also discourages unhealthy nutrition as students are exposed to different kinds of fruits and vegetables. This year, there were 345 registered gardens and approximately 300 contain edible produce. Through December 2012, a total of \$85,036 mini-grants were awarded.

7.3. Garden to Café Program: The Garden to Café program is a collaboration of GrowNYC's Grow to Learn, DOE's Office of SchoolFood, New York State's Department of Agriculture & Markets, and NYC Department of Parks, GreenThumb. The Garden to Café Program facilitates a connection between school gardens and healthy nutrition after seasonal harvests via educational events and activities. The number of registered schools more than doubled from 22 schools to more than 60 schools this school year. The objectives

of the program are to expose the entire student, teacher and parent body to the school garden, demonstrate how delicious vegetables are, increase agriculture literacy and interest in our regional food system, turn the school cafeteria into a learning environment, and to build awareness of the larger local food initiatives underway at SchoolFood.

7.4. Schoolyards to Playgrounds: Part of the PlaNYC 2030 Initiatives is to have all New Yorkers within a ten minute walk of a playground, park, or green space. New York City has the smallest amount of green space per person compared to other major American cities. In analyzing these types of spaces around the city, they realized that schoolyards were usually only used during the day and locked after school hours. The Department of Parks and Recreation, The Trust for Public Land (TPL), and the DOE are working together to help renovate and construct at least 290 playgrounds and parks in schoolyards. To date, 229 schoolyards have been transformed or opened to the public through longer operating hours, and include additions of features such as trees, benches, sport courts, synthetic fields, etc.

7.5. Plans for 2013-2014

- Continue with the expansion of Grow to Learn: School Garden Initiative
- Work with SchoolFood to encourage more schools to register for Garden to School Café Program
- Expand the number of schools participating in MillionTreesNYC

END OF SECTION ~ ECOLOGY

8. Recognition & Contests

8.1. Recognition

8.1.1. Chancellor Walcott Congratulates Students and Staff: In celebration of Earth Day 2013, Chancellor Dennis M. Walcott commended students, teachers, and principals for their dedicated efforts in promoting sustainability initiatives to increase recycling and reduce energy consumption. Refer to Appendix A for the press release.

8.1.2. U.S. Department of Education Green Ribbon Schools: Hubert H. Humphrey P.S. 57 in Staten Island was awarded the Green Ribbon School Award by the U.S. Department of Education, and it was the second straight year that they have been nominated. The Green Ribbon School award recognizes schools that are outstanding in reducing environmental costs and impact, promote good health, and maintain an effective environmental and educational program on sustainability. Patricia Lockhart, the school sustainability coordinator was awarded the Presidential Innovation Award for Environmental Educators in recognition of her outstanding support and contribution to environmental education. Refer to Appendix B to view a summary of P.S. 57's achievements as noted by the U.S. Department of Education or see pg. 85 of U.S. Department of Education Honorees Highlights⁴.

8.1.3. ECO-Schools USA Green Flag Award: P.S. 57 was the first DOE school to win the Green Flag award. It is the highest award possible through NWF's ECO-Schools USA Program. P.S. 57 was recognized for its exemplary work in the fields of recycling, energy conservation, ecology, and green curriculum. The school's recycling efforts have diverted more than 10,000 pounds of paper and milk cartons from landfills. Students converted 1,500 recycled bottles into a greenhouse for growing flowers. To commend the school for its hard work, DSF and the Office of Sustainability presented the school with a \$25,000 grant to further their sustainability initiatives.

8.1.4. 2012-2013 Maathai Award for Civic Participation in Sustainability: Developed by The Rockefeller Foundation, The Bette Midler Family Trust, and MillionTreesNYC, the Maathai Award for Civic Participation honors one male and one female NYC public school high school senior with a grant of \$10,000 to be used towards their first year of college. The award was started in honor of Dr. Wangari Maathai, the first African woman to win the Nobel Peace Prize, who launched the Green-Belt Movement in Kenya. The movement promoted sustainable living by planting trees, while also promoting women's rights and democracy. Award candidates must demonstrate outstanding commitment and achievement in civic

⁴ <http://www.p12.nysed.gov/facplan/documents/2013HonoreeHighlights.pdf>

engagement and sustainability, as well as having demonstrated a sustainable effort undertaken by them that mobilized and inspired others to make their environment more sustainable. The winners for school year 2012-2013 were Cecil Brooks, Jr. of South Bronx Preparatory School Academy, and Awa Sow of Manhattan Comprehensive Night and Day School.

8.2. Contests

8.2.1. Energy Conservation Art Work Contest: The DOE honored the winners of the energy efficiency artwork contest with an award ceremony hosted by the Metropolitan Museum of Art. The grand prize was awarded to 6th grader Andriy Yegorov. His artwork (shown in Figure 13) will be on the cover of 12,000 calendars that will be distributed for school year 2013-2014. All fourteen students, whose artwork was displayed in the calendar, received prizes. For full list of winners refer to Appendix C.



Figure 13: Grand Prize Winner

8.2.2. Green Cup Energy Challenge: Created by the Green Schools Alliance (GSA), the Green Cup Energy Challenge seeks to encourage student participation in their school community, while also fostering a better understanding of energy and resource conservation. The Challenge is a four-week competition, where students attempt to reduce their school's energy consumption compared to a three-year average baseline. In the fall of 2012, 182 DOE schools participated in the month of November, reducing their electricity consumption by 1,259,844 kWh. The savings conserved 1,959,651 lbs. of greenhouse gas emissions. The top school, W.E.B DuBois High School, reduced consumption 41.7 percent from their baseline. P.S./ I.S. 66 in Brooklyn came in second and reduced 40.67 percent from the baseline while P.S. 123 in Queens came in third and reduced 39.8 percent. The top school received an award of \$19,500, while second and third place schools received \$13,500 and \$7,000 respectively. The full list of winners is in Appendix D.

8.2.3. DSNY Golden Apple Awards: DSNY's Golden Apple Awards recognize schools that accomplish projects on waste prevention, recycling, composting, and neighborhood beautification. The annual competition consists of three contests: TrashMasters! Super Recyclers, honoring schools with exemplary recycling programs; TrashMasters! Reduce and Reuse Challenge, which celebrates creative waste prevention methods; and TrashMasters! Team Up to Clean Up, which encourages DOE students to help clean and beautify their schools and neighborhoods. Schools can compete in any or all three competitions and vie for awards on a grade and borough level. Winning schools receive cash prizes; citywide winners were awarded \$10,000; borough winners \$5,000; borough runners-ups \$2,500; and honorable mentions \$1,250. For schools with outstanding composting

programs, Golden Shovel Award winners received \$1,000. The winning schools for all categories are listed in Appendix E.

8.2.4. Solar One GDL Energy Challenge: In addition to green curriculum initiatives, 55 schools participated in GDL’s energy challenge. The four month long challenge inspires students to conserve and lessen energy consumption at their schools. Students compare their current electrical usage to previous years’, and the schools with the greatest reduction in usage are awarded cash prizes. This year, all schools reduced electrical use by at least 7 percent. P.S. 84 in Queens won the top prize of \$10,000 by reducing electrical consumption by 22 percent (see Appendix F). P.S./M.S. 194 in the Bronx came in second by reducing usage by 20 percent, winning \$7,500. The Academy for Environmental Leadership in Brooklyn was awarded first place for a school in a campus building and was also awarded \$7,500 for reducing electrical consumption by 19 percent.

END OF SECTION ~ RECOGNITION & CONTESTS

9. Sustainability Survey

The schools that designated a sustainability coordinator were eligible to complete the annual sustainability survey required by Chancellor's Regulation A-850. Out of 1526 sustainability coordinators, 1,452 completed it for a response rate of 95 percent (see Figure 14).

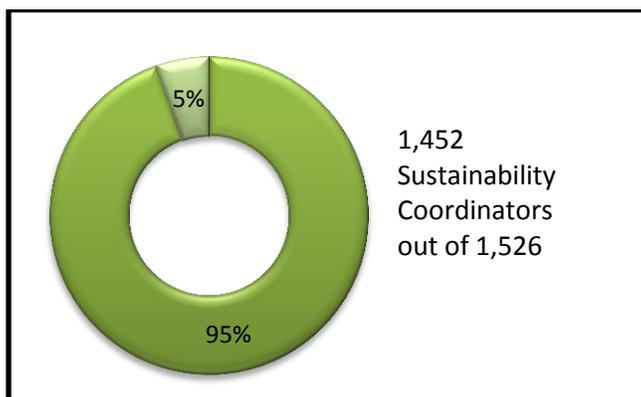


Figure 14: 2013 DOE Sustainability Survey Participation

9.1. Survey Format: The design of the 2013 sustainability survey did not change from the 2012 survey. Sustainability coordinators had to indicate their name, e-mail address, school name, and principal name. There were a total of seven questions and all but one question allowed multiple responses (see Appendix G). At the end of the survey, after responding to all survey questions, responders were also allowed to input comments expressing any concern or achievement. Listed below are the seven questions used in the survey:

- How did you communicate action items from your sustainability plan to your school's community?
- How does your school implement paper recycling?
- What percentages of classrooms have separate, appropriately labeled containers/bins for paper recycling?
- How does your school implement recycling in the cafeteria?
- Are there separate appropriately labeled recycling containers for bottles, cans, foil and milk/juice cartons in the following common areas?
- Did your school take any of the following steps to meet your energy reduction target for the year?
- What kind of support would you need to implement school sustainability plans?

9.2. Survey Statistics

9.2.1. Communication Methods: The methods that were most utilized by schools included bulletin board postings (66.5 percent), faculty meetings (58 percent), and student projects (50.5 percent). The least used methods were having guest

speakers (8.4 percent), media events (2.8 percent), and school newsletters (16.6 percent). Results of the survey indicate a similar outcome to that of previous years' surveys, implying that schools have consistently used the same three methods due to the relative ease of use (shown in Figure 15).

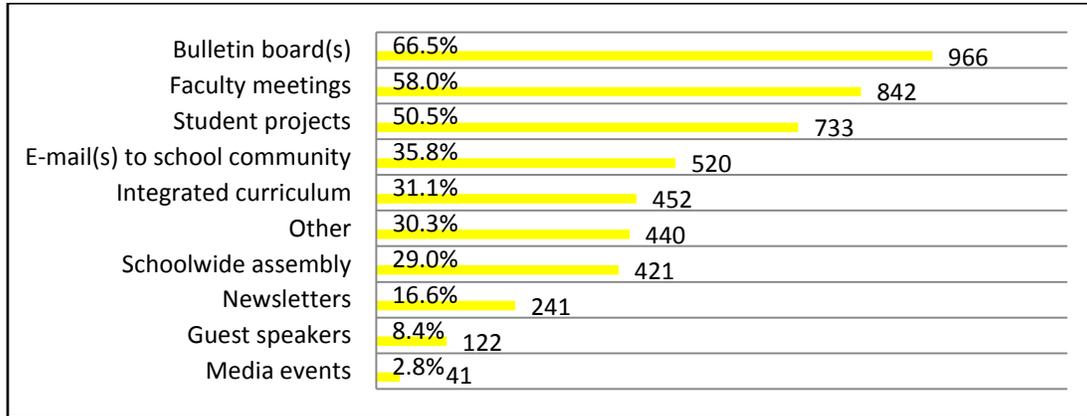


Figure 15: How did you communicate action items from your sustainability plan to your school's community?

9.2.2. Implementing Paper Recycling: A total of 1,275 schools indicated that every classroom had at least one appropriately labeled recycling bin for paper for a rate of 87.8 percent. A total of 1,265 schools also indicated that offices have at least one appropriately labeled recycling bin for paper for a rate of 87.1 percent. Paper recycling around office printers/copying machines and mailboxes ranged from 50.1 percent to 42.3 percent respectively. Only 2.3 percent of schools (33 schools) expressed that they did not have any paper recycling setup at their schools (shown in Figure 16).

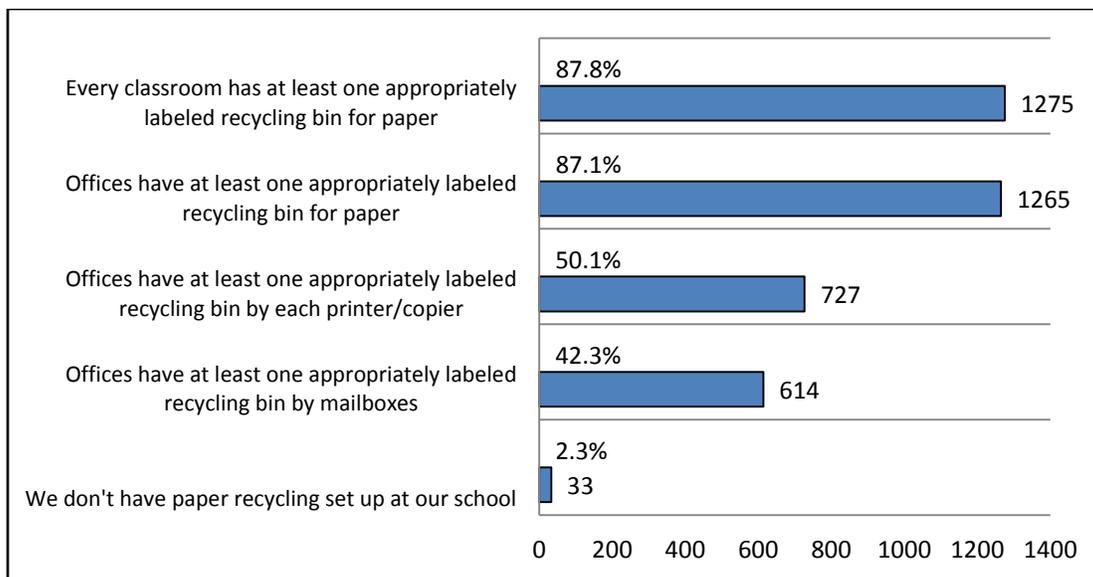


Figure 16: How does your school implement paper recycling?

9.2.3. Classrooms with Appropriate Recycling Bins: A total of 1,086 or 74.8 percent of surveyed school indicated that 76 percent or more of their classrooms have separate and appropriately labeled bins for paper recycling. A little over 86 percent of sustainability coordinators indicated that at least 51 percent or more of their classrooms are fitted with appropriate paper recycling bins, indicating that small improvements were made to increase the volume of appropriate recycling bins (shown in Figure 17).

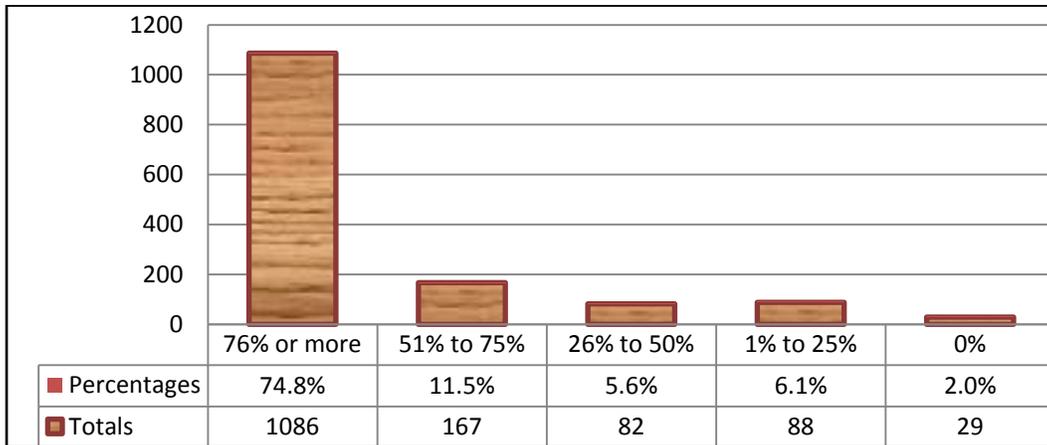


Figure 17: What percentages of classrooms have separate, appropriately labeled containers/bins for paper recycling?

9.2.4. Recycling in Cafeteria: Only 48.8 percent of surveyed schools indicated that they have garbage cans next to every recycling bin, and only 48.1 percent of schools indicated that they have separate recycling station(s) with dump bucket for liquids beside labeled bins for bottles, cans, foil and milk/juice cartons. Results for other categories on cafeteria recycling are also below paper recycling efforts, and as a result 17.5 percent of schools reported having no established system of recycling in cafeterias (shown in Figure 18).

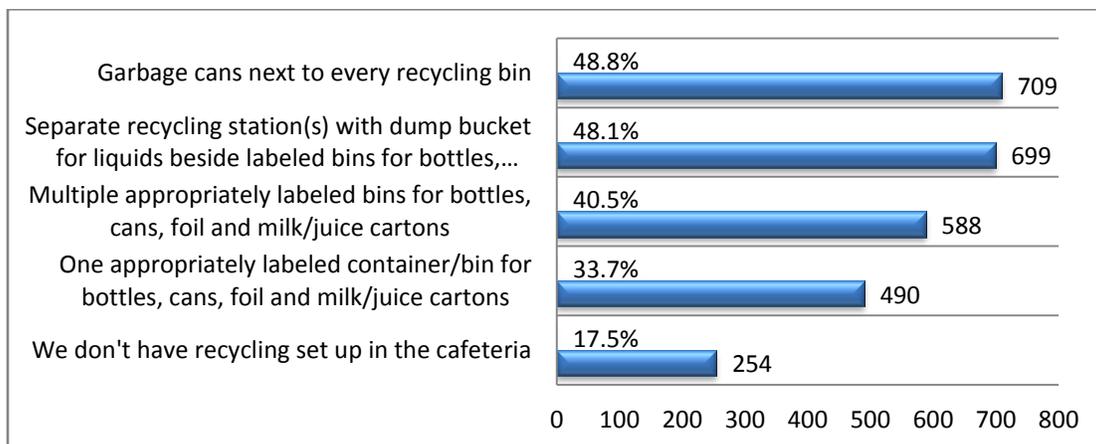


Figure 18: How does your school implement recycling in the cafeteria?

9.2.5. Location of Recycling Bins: The majority of recycling bins for bottles, cans, foil, and milk/juice cartons are located in the teacher’s lounge (61.6 percent) and in other areas, excluding the cafeteria, where food and beverage is routinely consumed (57.9 percent) (shown in Figure 19).

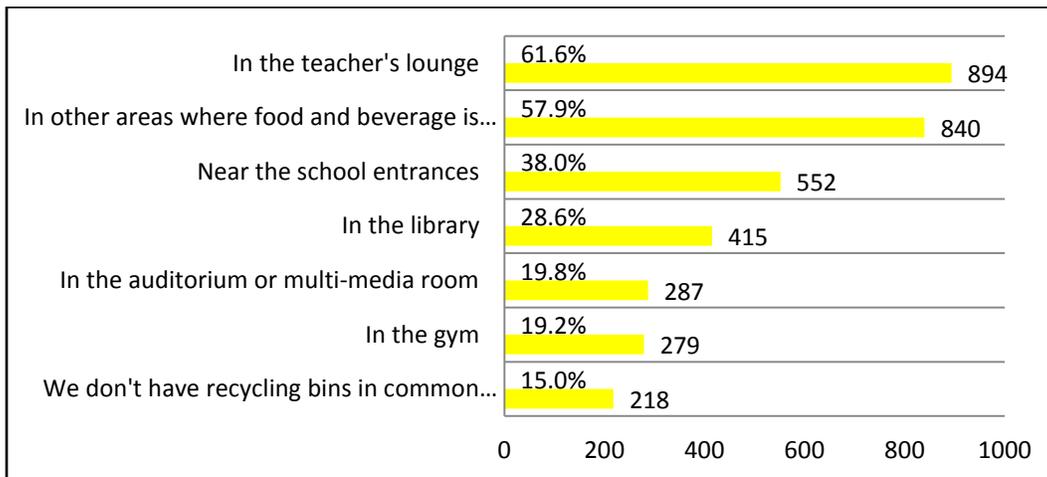


Figure 19: Are there separate appropriately labeled recycling containers for bottles, cans, foil, and milk/ juice cartons in the following areas?

9.2.6. Energy Reduction Methods: Turning off lights when not in use remained the most popular method of reducing energy usage (98.3 percent). There was however an overall increase in other methods (shown in Figure 20). Most schools have implemented the same methods year to year as their top energy reduction methods, including; turning off lights, unplugging appliances, and working with the custodian engineer.

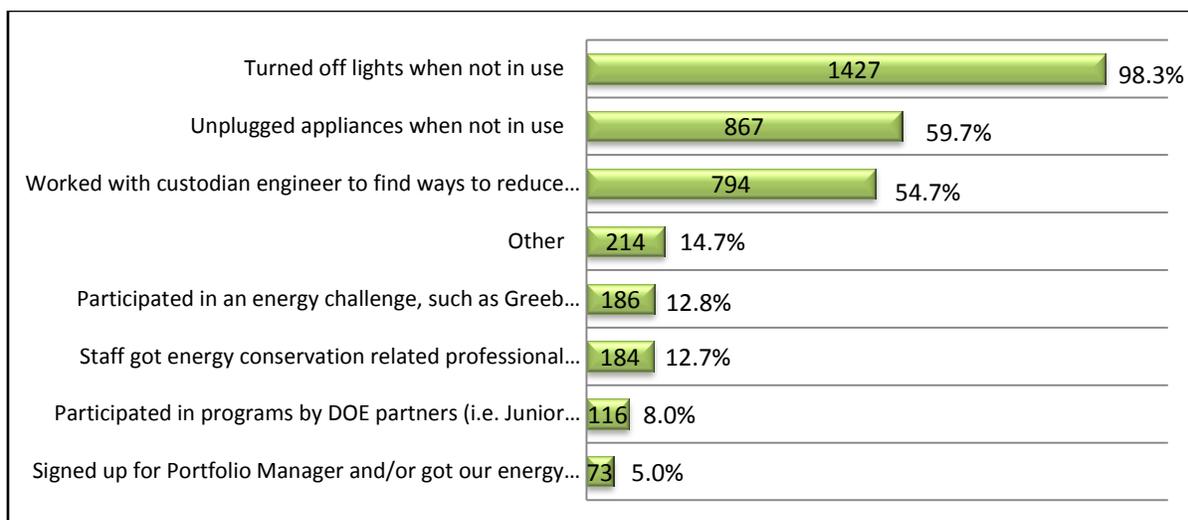


Figure 20: Did your school take any of the following steps to meet your energy reduction target for the year?

9.2.7. Support Ideas: Sustainability coordinators were asked what kind of support they needed to implement school sustainability plans with a list of choices. The majority chose to indicate there is a lack of resources in the availability of recycling bins and appropriate labels. Fifty-eight percent of schools indicated that they would like better or more recycling container/bins, and 42.1 percent indicated that they need recycling container labels and signage from the Department of Sanitation (shown in Figure 21).

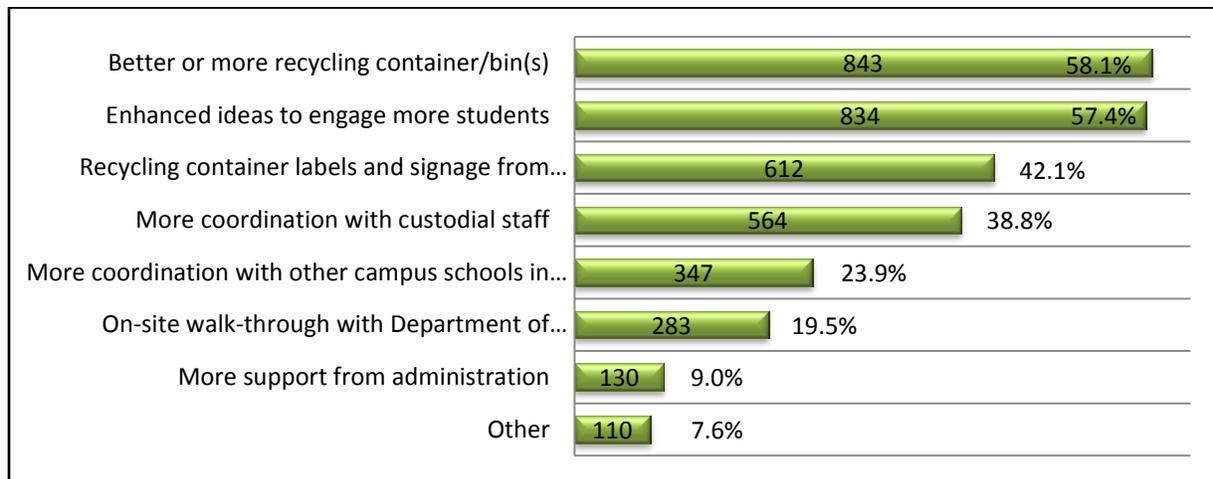


Figure 21: What kind of support would you need to implement school sustainability plans?

9.2.8. Comments: At the end of the survey, coordinators were allowed to leave open-ended comments. There were a total of 309 comments, both positive and negative. The majority of positive comments highlighted a school’s success in implementing a successful sustainability plan and improvements that were made during the school year. The majority of negative comments were aimed at the lack of available resources or funding, such as recycling bins/boxes.

10. Appendices

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APPENDIX A: Chancellor Walcott’s Press Release – April 22, 2013

For Earth Day, Schools Chancellor Walcott Congratulates Students, Teachers and Principals for Their Environmental Initiatives to Reduce Energy Use and Increase Recycling In Schools

The Top Ten Schools in The Green Cup Challenge™ Reduced Carbon Dioxide Emissions By 35% on Average in One Month

For Earth Day, Schools Chancellor Dennis M. Walcott today congratulated students, teachers and principals for their environmental initiatives to conserve energy, increase recycling and reduce the carbon footprint. To learn about energy conservation, students in 182 school buildings participated in the Green Cup Challenge™, an annual, student-led event that supports efforts to measure and reduce school-based electricity use for one month. The competition, which ran from Nov. 5- Dec. 3, was created by the Green Schools Alliance (GSA), a nonprofit organization of public and private schools whose aim is to meet the Mayor’s PlaNYC target of reducing carbon emissions 30 percent by 2017. Today, the schools received grants totaling \$185,000, sponsored by the Department of Education (DOE) and the City’s Department of Citywide Administrative Services (DCAS). The top ten schools were able to reduce energy consumption on average by 35 percent.

The Chancellor made the announcement at the Leadership and Public Service High School, one of the winners of the Green Cup Challenge™, and he was joined by Deputy Chancellor for Operations Kathleen Grimm, CEO of School Facilities for the DOE John Shea, Actor and Environmentalist Matthew Modine, Chief Energy Management Officer for the Department of Citywide Administrative Services Kristin Barbato, Department of Sanitation Deputy Commissioner for Recycling and Sustainability Ron Gonen, Council Members Margaret S. Chin and James F. Gennaro, Green Schools Alliance President and Founder Peg Watson, Solar One Executive Director Chris Collins, GrowNYC Manager for Recycling Programs Robert Lock, the High School for Leadership and Public Service Principal Philip Santos, United Federation of Teachers Safety and Health Director Chris Proctor and Director of New York City Public Affairs for Con Edison David Gmach.

“Thanks to our students, teachers and principals, our schools are able to reduce energy consumption and increase recycling in order to preserve our natural resources for future generations,” Chancellor Walcott said. “I want to thank city agencies and our non-profit partners for their continued support in this effort.”

“There are dozens of things each of us can do every day that have an immediate, positive impact on the environment,” Actor and Environmentalist Matthew Modine said. “NYC students understand the challenges we collectively face. I support the Green Cup Challenge because it’s teaching our students how to create a more sustainable and balanced future. The students have learned why decreasing consumption and reducing waste is so crucial for their future.”

“It is very exciting to see so many schools contributing to energy conservation programs. The lessons these students learned during this Green Cup Challenge can be carried into their everyday practices to make New York City even more energy efficient,” said Kristin Barbato, Chief Energy Management Officer for the Department of Citywide Administrative Services.

“DOE is central to our recycling and waste reduction programs. It provides an opportunity to teach today and tomorrow's generation the importance of recycling and conservation,” said Department of Sanitation Deputy Commissioner for Recycling and Sustainability Ron Gonen.

The DOE has been working with various partners to introduce recycling and conservation in schools. For example, Solar One provides a curriculum to 15 schools that focuses on sustainability and preserving our natural resources and allows students to use their own school buildings as a science lab to monitor energy use. Solar One and the DOE co-sponsored a four-month Energy Challenge from December 2012 to March 2013. There were 55 schools that participated and the top three winners will share \$25,000 in cash prizes for reducing energy usage over four months. The winning schools are P.S. 84 in Queens, P.S./M.S. 194 in the Bronx and the Academy of Environmental Leadership on the Bushwick Campus. Another partner, GrowNYC, is working with 50 school communities to increase recycling, up from ten last year.

With GrowNYC, the Sanitation Department and the Mayor's Office, the DOE is expanding the City's composting program which began last year as a pilot in nine schools on the Upper West Side in District 3. The pilot, which ran from February 2012 to June 2012, diverted 85 percent of waste from landfills and decreased the number of garbage bags from 54 to eight. This year the program includes an additional 61 schools in Manhattan and Brooklyn and this month, the program expanded to 22 schools on Staten Island. For composting, all waste is separated into containers for liquids, paper, discarded food, glass and bottles.

Last year, the DOE opened the High School for Energy and Technology which offers students a curriculum that incorporates conservation and preservation. In its first year, it was one of 17 schools to receive a grant from the National Wildlife Federation's Eco-Schools USA program to participate in the “Wrigley's Litter Less Campaign” – a campaign aimed at reducing waste and litter and increasing recycling. The school has a “Green Team” which meets twice monthly to coordinate recycling and clean-up activities throughout the City. In addition, the DOE is constructing a Net Zero Energy building on Staten Island which will serve as a lab for future energy saving construction. What is so unique about this building is that all electricity not in use will go to the local community.

“Our school buildings consume 25 percent of the electricity used in New York City public facilities, and we are working with our sustainability coordinators to reduce this energy use,” said Deputy Chancellor of Operations Kathleen Grimm.

To reduce energy use at the Leadership and Public Service High School, the principal made daily announcements about energy conservation, and students made sure that computers and non-essential electrical equipment were shut off when not in use. School staff took advantage of the daylight to keep lights off in the cafeteria and lobby, and science teachers integrated energy conservation into their lessons. The custodial staff reduced the use of its water pump and exhaust when the building was not in use.

Leadership and Public Service High School Principal Santos said, “Our students, teachers and staff are committed to reducing the carbon footprint by making sure lights are out in rooms not being used and that common areas take advantage of the natural light from outdoors.” “As Founding Members of the Green Schools Alliance, DOE schools are benchmarking their energy use and reducing their environmental impact through sustainable, energy-smart solutions,” said Peg Watson, President of the Green Schools Alliance. “NYC public schools’ performance in the Green Cup Challenge places them at the forefront of student-led experiential education on energy conservation and climate change as we all work to meet the Mayor’s environmental goals.”

“Con Edison is proud to support organizations that teach young people the importance of keeping our environment clean and ensuring that New York City remains a safe, healthy place to live and work,” said David Gmach, Con Edison Director of New York City Public Affairs. These educational programs fit perfectly with our emphasis on helping our customers use less, not more, energy.”

“GrowNYC is proud to work alongside the Department of Education to ensure that we provide high-quality, high-impact programs for NYC’s young people: the next generation of civic and environmental stewards,” said Marcel Van Ooyen, Executive Director of GrowNYC. “Programs like Grow to Learn: Citywide School Gardens Initiative and Recycling Champions, both in partnership with DOE, create school-wide impacts: be it improving recycling rates for an entire school campus or getting a majority of children outside in a learning garden where insects and botany spring to life subjects like science, art and much more.”

“Congratulations to all 55 schools that participated in Solar One’s Energy Challenge. It is truly gratifying to see how much the top 3 winners saved on their electric bills – an average of a whopping 20 percent, as compared with the same 4 month period from the previous 2 years,” said Chris Collins, Executive Director of Solar One. “It is also very exciting to see how the Green Design Lab™, through the strong support of the NYC Department of Education, is proving that our students, with the help of their teachers, custodians and parents, can be the grassroots engine for positive change.”

“The custodial staff and our sustainability coordinators are working hard to ensure each school recycles and conserves every day,” said John Shea, CEO of the DOE’s Division of School Facilities. “We also have great partnerships with City agencies and nonprofits to assist our schools in this effort.”

“CSA honors this year’s sustainability pioneers, all the school leaders, the teachers and especially the students who are forging the way and setting the example to conserve energy and support the campaign to create the strongest possible conservation policies,” said Ernest Logan, President of the Council of School Supervisors and Administrators.

“The UFT is proud of the Green Cup Challenge winners and the schools that embraced sustainability programs as part of their curriculum,” said Christ Proctor, UFT director for Safety and Health. “Their ideas on how we can live in harmony with the planet are truly innovative and inspiring, and it’s these types of projects that will help make the world a better place to live. We hope to bring these sustainability programs to more students in the years to come.”

“Today on Earth day, we pause to appreciate every aspect that makes our planet beautiful, reliable, and sustainable,” said Council Member Robert Jackson, Chair of the Education Committee. “We are the faces of this planet and must work together so that together, we can continue our efforts to protect our earth. I congratulate our students and schools for doing their part in reducing our carbon footprint and taking action in protecting the amazing planet that we call home.”

“The sustainability measures being taken by our schools is having a big impact in terms of reducing our carbon footprint, and is a big reason why our city is well on its way to a 30 percent reduction in greenhouse gas emissions by 2017,” said Council Member James F. Gennaro (D-Fresh Meadows), chair of the City Council’s Committee on Environmental Protection. “Through programs like the Solar One curriculum, we are also teaching the next generation to conserve energy and to be better stewards of our environment. I thank Chancellor Walcott for his leadership in making our schools a greener, more energy efficient and sustainable place.”

“It is important to pass on the lesson of caring for our environment to our young people,” Council Member Margaret Chin said. “Reducing the use of electricity during the school day is a skill our students can easily take home and use in their everyday lives. I want to thank Chancellor Walcott and the Green Schools Alliance for encouraging sustainable and earth-friendly practices in our public schools.”

State Senator Daniel Squadron said, “Congratulations to the Leadership and Public Service High School -- an academic leader, and now an environmental one as well! Greener schools mean a greener New York. By teaching our kids how to live green early on, we're helping to ensure that they carry those practices for the rest of their lives. Thank you to the Green Schools Alliance, DOE, and all of our colleagues working for a more sustainable New York.”

APPENDIX B: Letter from U.S. Department of Education to Hubert H. Humphrey P.S. 57

To elementary students at Hubert H. Humphrey PS 57, learning about the environment and working to save it go hand in hand. The diverse population of the Title I school – of which 100 percent is eligible for free or reduced-price lunch – partners with *MillionTreesNYC* to work in a neighborhood park to care for trees, conduct summer pond clean-ups, and collect water quality data for the EPA. Along with two schools, Margaretville Central – which is located in upstate New York – and Eltingville Lutheran – which is local -- PS 57 participates in science-based Catskill Watershed programs that share curriculum about the importance of protecting the state’s communal watershed.

Led by teachers including a 2012 EPA Presidential Innovation Award for Environmental Educators honoree, students are immersed in project-based learning that explores energy conservation, climate change, and ecological restoration. After student-run teams collect and weigh recyclables, for example, teachers use the collected data in computer, math, and literacy lessons.

The school’s robotics team has participated in several projects that increased student understanding of sustainability concepts while helping the environment. Three years ago, the team’s fifth graders drafted a plan for a sea wall around Staten Island’s low-lying coastal areas to protect the borough from storm surges and floods, which are expected to increase due to global warming. State legislators, who were impressed by students’ extensive research and in-depth presentation, invested \$500,000 into a study that addressed beach erosion caused by rising sea levels. To build a solar-powered vehicle, the robotics team learned about renewable energy in science classes, went on a trip to the Solar I museum, and built small solar cars, Lego E-Lab solar scooters, windmills, and watermills. Then, with the New York Power Authority and a local electrician, the team built its own adult-sized solar-powered tricycle that delivers wood chips, flowers, and plants to the school garden.

Using the knowledge they gain from national programs, like *Eco-Schools USA*, *Cool the Earth* and the *Green Schools Alliance Green Cup Challenge*, students lead conservation initiatives that enhance building upgrades to reduce the school’s environmental impact, cut its greenhouse gas emissions, and save up to 28 percent on energy usage since 2008. Approximately 30 percent of the school’s solid waste has been diverted from landfills due to high-quality composting and recycling programs.

GrowNYC, *Grow to Learn*, and *Green Thumb* work with P.S. 57 students in their 7,350 square foot outdoor garden to plant and grow produce for the school cafeteria. In 2011, P.S. 57 collaborated with Eltingville Lutheran School and the Eagle Scouts to obtain a *Home Depot* grant that allowed a student-built green house to be built from 1,500 recycled plastic bottles in the garden. While the garden provides a valuable resource for teaching students about nutrition, the school also partakes in *Farms for City Kids*, through which students spend a week at a Vermont farm to learn about sustainable agriculture, and healthy eating and cooking.

While an impressive 90 percent of students walk to school, outdoor time at P.S. 57 isn't limited to the commute. At least half of students' gym time is spent in an outdoor PlaNYC yard that includes basketball, soccer, tennis, and track. To reduce TV and media usage among students, P.S. 57 implements curricula, like *Student Media and Awareness for the Reduction of Television-viewing (SMART)* and *Fit by 5* and participates in campaigns, like *National TV Turn-off Week*.

APPENDIX C: Energy Conservation Art Work Contest Winners

Cover and Grand Prize Winner: Andriy Yegorov, 6th grader at Brooklyn's Bay Academy

Honorable mentions:

Davon Nagy, 7th grade honor student at IS 141 in Queens

Kristin Persaud, 11th grader at Renaissance High School for Musical Theater and Technology in the Bronx

Student art displayed in 2013-2014 DOE Energy Efficiency Calendar:

September: Alaha Nasari, 5th grader at PS 154 in Queens.

October: Jaylan Wu, PS 21 in Queens

November: Nivshaan Munday, Kindergarten student at P.S. 133 in Queens

December: Eza Ilias, 8th grader at JHS 217 in Queens

January: Rina Wang, 11th grader at LaGuardia Arts High School in Manhattan.

February: Sophia Scully, 2nd grader at PS 8 in Staten Island

March: Jaylene Delgado, 7th grade Honors student IS 141

April: Rachel Friedland, 4th grader at NEST+M in Manhattan

May: Stephanie Schwartz, 1st grader at P.S. 133 in Queens

June: Gundeep Munday, 4th grader at P.S. 133

July: Caitlin Garcia, 9th grader at Mott Hall HS in Manhattan

August: Pritha Patel 3rd grader at P.S.133

APPENDIX D: Green Cup Energy Challenge Winners

Winning Schools	% Reduction	Grant Amount
W.E.B. Du Bois High School	41.70%	\$19,500.00
P.S. / I.S. 66 in Brooklyn	40.67%	\$13,500.00
P.S. 123 in Queens	39.80%	\$7,000.00
P.S. 81 in Brooklyn	36.42%	\$4,500.00
The Eagle Academy For Young Men in the Bronx	35.55%	\$6,500.00
PS/MS 84 in Queens	34.19%	\$2,000.00
P.S. / I.S. 155 in Brooklyn	33.45%	\$2,500.00
I.S. 27 on Staten Island	32.66%	\$2,500.00
P.S. 41 in Brooklyn	32.42%	\$2,500.00
Leadership And Public Service High School	28.66%	\$2,000.00

APPENDIX E: DSNY Golden Apple Award Winners

Division	Award	School	Amount
TrashMasters! Super Recyclers			
Elementary	Citywide & Borough Winner	PS 310 K	\$ 10,000
Intermediate	Queens Golden Shovel	IS 204 O.W.H. Magnet School for Living Green in a Global Society	\$ 11,000
Intermediate	Borough Winner	PS 89 Cypress Hills	\$ 5,000
Intermediate	Borough Runner-Up	Andries Hudde IS 240	\$ 2,500
Intermediate	Honorable Mention	Baychester Middle School	\$ 1,250
High School	Honorable Mention	Office of Adult & Continuing Education - Region 4	\$ 1,250
TrashMasters! Reduce & Reuse Challenge			
Elementary	Citywide & Borough Winner	E C Blum PS 46	\$ 10,000
Elementary	Borough Runner-Up	Brooklyn New School PS 146	\$ 2,500
Elementary	Borough Winner	PS 199 Jessie Isador Straus	\$ 5,000
Elementary	Borough Runner-Up	PS 89 Liberty School	\$ 2,500
Elementary	Staten Island Golden Shovel	PS 57 Hubert H Humphrey	\$ 2,250
Intermediate	Citywide & Borough Winner	John Ericsson MS 126 Magnet School for Env. Engineering	\$ 10,000
High School	Citywide & Borough Winner	Maspeth High School	\$ 10,000
High School	Borough Winner	Urban Assembly School for Wildlife Conservation X372	\$ 5,000
High School	Honorable Mention	Stuyvesant High School	\$ 1,250
TrashMasters! Team Up To Clean Up			
Elementary	Citywide & Borough Winner	PS 107 John W Kimball Learning Center	\$ 10,000
Elementary	Borough Runner-Up	Brooklyn Arbor	\$ 2,500
Elementary	Honorable Mention	PS 132K The Conselyea School	\$ 1,250
Elementary	Brooklyn Golden Shovel	PS 32 Samuel Sproule Mills School	\$ 1,000
Elementary	Borough Winner	The Family School X443	\$ 5,000
Elementary	Borough Winner	PS 166 Richard Rodgers School of the Arts & Technology	\$ 5,000

APPENDIX F: Solar One Energy Challenge Winners

1 st Place Winner	P.S. 84 Steinway	\$10,000
2 nd Place Winner	P.S/ M.S. 194 Bronx	\$7,500
1 st Place Campus Building Winner	Academy for Environmental Leadership	\$7,500

APPENDIX G: Survey Questions and Format

2013 Department of Education Annual Recycling/Sustainability Implementation Survey

General Information

Organization Code _____

District Borough Number _____

School Name _____

Principal's Name _____

Coordinator's Name _____

Coordinator's E-mail Address _____

How did you communicate action items from your Sustainability Plan to your School's community? Check all that apply.

- Bulletin board(s)
- School-wide assembly
- Guest speakers
- E-mail(s) to school community
- Student projects
- Faculty meetings
- Newsletters
- Integrated curriculum
- Media events
- Other

How does your school implement paper recycling? Check all that apply.

- Every classroom has at least one appropriately labeled recycling bin for paper
- Offices have at least one appropriately labeled recycling bin for paper
- Offices have at least one appropriately labeled recycling bin by each printer/copier
- Offices have at least one appropriately labeled recycling bin by mailboxes
- We don't have paper recycling set up at our school

What percentage of **classrooms** have separate, appropriately labeled containers/bins for paper recycling? Choose one of the following options.

- 0
- 1% to 25%
- 26% to 50%
- 51% to 75%
- 76% or more

How does your school implement recycling in the **cafeteria**? Check all that apply.

- One appropriately labeled container/bin for bottles, cans, foil and milk/juice cartons
- Multiple appropriately labeled bins for bottles, cans, foil and milk/juice cartons

- Separate recycling station(s) with dump bucket for liquids beside labeled bins for bottles, cans, foil and milk/juice cartons
- Garbage cans next to every recycling bin
- We don't have recycling set up in the cafeteria

Are there separate appropriately labeled recycling containers for bottles, cans, foil and milk/juice cartons in the following **common areas**? Check all that apply.

- Near the school entrances
- In the gym
- In the auditorium or multi-media room
- In the library
- In the teacher's lounge
- In other areas where food and beverage is routinely consumed
- We don't have recycling bins in common areas

Did your school take any of the following steps to meet your energy reduction target for the year? Check all that apply.

- Participated in an energy challenge, such as Green Schools Alliance's Green Cup Challenge
- Turned off lights when not in use
- Unplugged appliances when not in use
- Signed up for Portfolio Manager and/or got our energy data and used in instruction
- Worked with custodian engineer to find ways to reduce energy from building operations
- Staff got energy conservation related professional development
- Participated in programs by DOE partners (i.e. Junior Energy, Solar One, CELF, etc.)
- Other

What kind of support would you need to implement school sustainability plans? Check all that apply

- More coordination with other campus schools in the building
- More coordination with custodial staff
- More support from administration
- Enhanced ideas to engage more students
- On-site walk-through with Department of Sanitation Recycling Specialist
- Recycling container labels and signage from Department of Sanitation
- Better or more recycling container/bin(s)
- Other

Additional Comments

The NYC DOE
Sustainability Initiative