City of New York

OFFICE OF THE COMPTROLLER

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COMPTROLLER

FINANCIAL AUDIT

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Deputy Comptroller for Audit

Audit Report on the Department of Citywide Administrative Services' Energy Conservation Efforts

7E14-120A
July 7, 2015
http://comptroller.nyc.gov

THE CITY OF NEW YORK
OFFICE OF THE COMPTROLLER
1 CENTRE STREET
NEW YORK, NY 10007

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July 7, 2015

To the Residents of the City of New York:

My office has audited the New York City Department of Citywide Administrative Services (DCAS) Energy Management (DEM) to determine whether DCAS-DEM is ensuring that energy efficiency goals and measures are being implemented for City buildings. We audited DCAS as a means of ensuring that the City is properly implementing programs designed to conserve energy and meet the challenges of climate change.

The audit found that DCAS-DEM has not consistently ensured that energy efficiency goals and measures are implemented for City buildings. In particular, DCAS-DEM lacks in-house goals for the reduction of greenhouse gas (GHG) emissions and does not track the progress it has made to reduce these emissions for City buildings. Moreover, the audit found DCAS's reporting in the Mayor's Management Report to be inconsistent and, therefore, of questionable utility. Additionally, the audit found several problems in DCAS-DEM's management of energy efficiency efforts and compliance with Local Laws 84 and 87. Many of these deficiencies are attributed to significant weaknesses in DCAS-DEM's internal controls, which include a lack of written policies and procedures and an absence of supporting documentation. As a result, DCAS-DEM's ability to oversee the City's goal of reducing municipal GHG emissions for City buildings, including compliance with the local laws, has been severely hampered.

The audit makes 10 recommendations, including that DCAS-DEM establish in-house GHG emission reduction goals to determine the extent to which its actions contribute to the overall City goal of reducing GHG emissions and to help ensure that the City meets its goal of reducing GHG emissions by 30 percent between 2006 and 2017. It should also establish formal written policies and procedures that explain how the indicators presented in the Mayor's Management Report are computed. DCAS-DEM should also comply with Local Law 84 by ensuring it includes all required buildings in its benchmarking, and establish written procedures and a methodology for benchmarking buildings associated with campuses (e.g., multiple buildings with shared energy meters).

The results of the audit have been discussed with DCAS-DEM officials, and their comments have been considered in preparing this report. Their complete written response is attached to this report.

If you have any questions concerning this report, please e-mail my Audit Bureau at audit@comptroller.nyc.gov.

Sincerely,

Scott M. Stringer

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EXECUTIVE SUMMARY

In 2007, the Mayor's Office of Long-Term Planning and Sustainability (currently named the Mayor's Office of Sustainability) prepared "PlaNYC: A Greener, Greater New York," a report that set forth goals and standards for the City and its residents for conserving energy, reducing greenhouse gas (GHG) emissions, reducing climate change, responding to its consequences, and fostering economic growth. PlaNYC was updated in 2011 and contained recommendations and specific initiatives that City agencies were to undertake, including the construction of buildings in compliance with "green" environmental standards, and the determination of actual consumption of electricity, natural gas, steam and fuel oil in City buildings. Because the reduction of GHG emissions is an important step in mitigating the impact of climate change, PlaNYC proposed that by 2017 the City reduce municipal GHG emissions by 30 percent below the Fiscal Year 2006 level of 3.79 million metric tons.

To carry out PlaNYC's goals, the City enacted the "Greener, Greater Buildings Plan," which includes various legislative initiatives designed to make large New York City buildings more energy efficient and thereby reduce the City's GHG emissions. Two specific pieces of legislation are the major focus of this audit: Local Law 84 (which requires "benchmarking" energy and water use annually); and Local Law 87 (requiring energy audits and retro-commissioning of building systems). These local laws apply to all buildings located within New York City, whether privately or publically owned, with some exceptions. This audit is concerned only with buildings owned and managed by the City (City buildings).

The City's Department of Citywide Administrative Services' (DCAS) Energy Management (DEM) has a key role in ensuring that the energy conservation goals for City buildings in PlaNYC and the "Greener, Greater Buildings Plan" are fulfilled. DCAS-DEM is the entity responsible for managing energy accounts and energy efficiency initiatives for City government operations. DCAS-DEM's responsibilities include overseeing the City's goal of reducing municipal GHG emissions for City buildings, including compliance with the Greener, Greater Buildings Plan legislation.

DCAS-DEM benchmarks electricity, natural gas, and steam usage for all City buildings subject to Local Law 84, and records this information in the EPA's Portfolio Manager, except for those under the management of the Department of Education (DOE). DCAS-DEM is also responsible for

overseeing the preparation of City buildings' energy efficiency reports (EERs), and is responsible for submitting the required compliance schedule to the Department of Buildings (DOB), coordinating the implementation of retro-commissioning measures, and managing the design and construction of capital improvements. DCAS-DEM annually reports on its energy use performance in the Mayor's Management Report.

Audit Findings and Conclusion

The audit found that DCAS-DEM has not consistently ensured that energy efficiency goals and measures are being implemented in City buildings. In particular, DCAS-DEM lacks in-house goals for the reduction of GHG emissions and does not track the progress it has made to reduce these emissions for City buildings. Moreover, we found DCAS' reporting in the Mayor's Management Report (MMR) to be inconsistent and therefore, it is of questionable utility.

Additionally, we found the following problems in DCAS-DEM's management of energy efficiency efforts and compliance with Local Laws 84 and 87:

- Benchmarking of City buildings was incomplete.
- Data was improperly reported.
- Data was not adequately verified.
- DCAS-DEM's compliance schedule was incomplete.
- There were no official procedures for prioritizing buildings for energy efficiency projects.

We attribute many of these deficiencies to significant weaknesses in DCAS-DEM's internal controls. These include a lack of written policies and procedures and an absence of supporting documentation. As a result, DCAS-DEM's ability to oversee the City's goal of reducing municipal GHG emissions for City buildings, including compliance with the local laws, has been severely hampered.

Audit Recommendations

This report makes a total of 10 recommendations.

DCAS-DEM should:

1. Establish in-house GHG emission reduction goals (annual, long-term, etc.) in consultation with the Mayor's Office of Sustainability to determine the extent to which its actions contribute to the overall City goal of reducing GHG emissions and to help ensure that the City meets its goal of reducing GHG emissions by 30 percent between 2006 and 2017;
2. Establish and document a process for determining the in-house GHG emission reductions its efforts have thus far achieved, and continue to monitor and track its progress towards further achieving its goals in accordance with this process;
3. Establish formal written policies and procedures, including detailed definitions, that explain how the indicators presented in the Mayor's Management Report are computed. These policies and procedures should also establish a timeframe for the retention of documentation associated with these computations;

4. Comply with Local Law 84 by ensuring it includes all the required buildings in its benchmarking. To determine which buildings must be included, DCAS-DEM should establish procedures to ensure that it has and maintains an accurate inventory of such buildings;
5. Establish written procedures and a methodology for benchmarking buildings associated with campuses (e.g., multiple buildings with shared energy meters) and ensure that data is accurately measured and recorded;
6. Establish written procedures to address extreme fluctuations in City buildings' energy consumption, including assigning specific numeric parameters (i.e., tolerances) to define an extreme fluctuation in energy usage or GHG emissions. In addition, maintain sufficient documentation to show the results of investigations into fluctuations;
7. Verify the accuracy of the benchmarking data DOE reports;
8. Revise its compliance schedule so that it is complete and submit that schedule to DOB;
9. Submit revised compliance schedules to DOB on an annual basis to reflect changed conditions such as building additions, deletions or sub-meterings; and
10. Develop formal policies and procedures for prioritizing buildings for Local Law 87 compliance.

Agency Response

In its response, DCAS disagreed with the audit findings and stated that "the findings and conclusions in the Report are based on unsubstantiated claims and lack of understanding of DCAS' role in the City's overall energy efficiency efforts." DCAS also stated that it,

> made good faith efforts to bring clarity to the auditors about a very complex and specialized area of the energy management and energy efficiency sector to help them better understand the City's GHG emissions measurement and reporting methodology. However, the auditors' findings exhibit a limited knowledge of DEM's role within the larger context of the City's overall greenhouse gas (GHG) emissions reduction strategies as laid out in PlaNYC and One City: Built to Last, and in compliance with Local Laws (LL) 84 and 87 of 2009. The auditors failed to note that DEM is not solely responsible for compliance with LL 84 and LL 87 for City-owned buildings, but rather plays a key role in coordinating efforts under these laws with other City agencies. The failure to recognize the effort of other agencies in coordination with DEM calls into question the auditors' claims of 'deficiencies' in complying with these laws.

Notwithstanding these criticisms, with regard to the audit's 10 recommendations, DCAS agreed with two, claimed it had already implemented five, and disagreed with three.

The full text of DCAS' response is included as an addendum to this report.

AUDIT REPORT

Background

In 2007, the Mayor's Office of Long-Term Planning and Sustainability (currently named the Mayor's Office of Sustainability) prepared "PlaNYC: A Greener, Greater New York," which set forth goals and standards for the City and its residents for conserving energy, reducing GHG emissions, reducing climate change, responding to its consequences, and fostering economic growth. PlaNYC was updated in 2011 and contained specific initiatives and recommendations that City agencies were to undertake, including the construction of buildings in compliance with "green" environmental standards and the determination of actual consumption of electricity, natural gas, steam and fuel oil in City buildings. Because the reduction of GHG emissions is an important step in mitigating the impact of climate change, PlaNYC proposed that by 2017 the City reduce municipal GHG emissions by 30 percent below the Fiscal Year 2006 level of 3.79 million metric tons.[1]

To carry out PlaNYC's goals, the City enacted the "Greener, Greater Buildings Plan," which included four pieces of legislation designed to make large New York City buildings more energy efficient, and thereby reduce the City's GHG emissions. That legislation resulted in the enactment of four local laws: Local Law 84[2] (which requires "benchmarking" energy and water use);[3] Local Law 85 (establishing a New York City energy code); Local Law 87 (requiring energy audits and retro-commissioning of building systems); and Local Law 88 (requiring the upgrading of lighting systems and the installation of sub-meters). These laws apply to all buildings located within New York City, whether public or private, with some exceptions.

DCAS-DEM has a key role in ensuring that the energy conservation goals for City buildings in PlaNYC and the "Greener, Greater Buildings Plan" are fulfilled.[4] Specifically, DCAS-DEM is responsible for managing energy accounts and energy efficiency initiatives for City government operations. DCAS-DEM's responsibilities include overseeing the City's goal of reducing municipal GHG emissions for City buildings, including compliance with the Greener, Greater Buildings Plan legislation. According to the local laws discussed in this audit, a "City building" is generally defined as a building that is owned by the City or a building for which the City regularly pays all or part of the annual energy bills. DCAS-DEM's mission is "to serve as the hub for energy management for City government operations, from energy procurement to performance tracking, improved operations & maintenance, and building retrofits. DEM's long-term goals are to 1) ensure clean, reliable energy to support City operations, and 2) reduce greenhouse gas emissions of operations."

According to DCAS-DEM's website, a large portion of the reductions in GHG emissions from City government operations will be achieved by implementing energy efficiency measures, including retrofits, in City buildings. The "2013 Inventory of New York City Greenhouse Gas Emissions" estimates these measures will account for 57 percent of the total 30 percent target reduction.

[1] The Plan also set forth a city-wide goal for achieving a 30 percent reduction in GHG emissions for all buildings (municipal and private) by 2030. According to the "2007 Inventory of Greenhouse Emissions," the 2006 baseline GHG level was 3.84 million metric tons, which has been revised to 3.79 million metric tons in the "2014 Inventory of Greenhouse Emissions."
[2] The local laws are referred to either as Local Law or LL followed by the number of a particular local law.
[3] Benchmarking involves the collection of data about a building's total use of energy and water. Benchmarking also includes descriptive information such as the size and type/use of a building (e.g., education, courthouse, etc.). The benchmarking data is recorded in the federal Environmental Protection Agency's (EPA) online tool known as "Portfolio Manager."
[4] Energy Management (known as DEM) is one of the "Lines of Services" within the Department of Citywide Administrative Services.

Local Laws 84 and 87 are mechanisms through which GHG emissions reductions will be delivered for City buildings.

The City must comply with Local Laws 84 and 87, which impose the following requirements on the City:

- Local Law 84: Benchmarking Energy and Water Use requires all City buildings to record in the United States Environmental Protection Agency's (EPA) Portfolio Manager, the EPA's online benchmarking tool, each building's annual energy and water consumption, along with other descriptive information, in order to track and assess each building's energy consumption relative to similar buildings.

- Local Law 87: Energy Audits and Retro-Commissioning of Base Building Systems, requires City buildings to receive energy audits once every 10 years to analyze the energy consumption of their base building systems (e.g., lighting, heating equipment), and to identify energy conservation measures and recommend capital improvements. In addition, a retro-commissioning report that identifies deficiencies in base building systems and recommends remedial steps must be prepared. An energy audit and a retro-commissioning report comprise an EER that then must be submitted to DOB.[5] The law also requires that DCAS prepare a compliance schedule showing the dates that EERs for City buildings are due to DOB. The compliance schedule was to be submitted to DOB by December 31, 2011.

DCAS-DEM benchmarks electricity, natural gas, and steam usage for all City buildings subject to Local Law 84, and records this information in the EPA's Portfolio Manager, except for those under the management of the DOE.[6] DCAS-DEM also is responsible for overseeing the preparation of City buildings' EERs, and is responsible for submitting the required compliance schedule to DOB, coordinating the implementation of retro-commissioning measures, and coordinating the design and construction of capital improvements. DCAS-DEM annually reports on its energy use performance in the Mayor's Management Report. DCAS-DEM's staff of 29 personnel includes analysts, project managers, and administrators.

Objective

The objective of this audit is to determine whether DCAS-DEM is ensuring that energy efficiency goals and measures are being implemented for City buildings.

Scope and Methodology Statement

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter. This audit was conducted by auditors with engineering backgrounds.

[5] Local Law 87 requires that all deficiencies identified as retro-commissioning measures must be corrected before submitting EERs to DOB. Major operational deficiencies that can only be remediated by capital improvements must be completed within one year after submission of an EER.
[6] DOE records its own usage data into the EPA's Portfolio Manager.

The scope of this audit covers those City buildings for which DCAS-DEM was responsible for LL84 and LL87 compliance from January 2010 through December 2014. Please refer to the Detailed Scope and Methodology at the end of this report for the specific procedures and tests that were conducted.

Discussion of Audit Results

The matters covered in this report were discussed with DCAS officials during and at the conclusion of this audit. A preliminary draft report was sent to DCAS and discussed at an exit conference held on May 29, 2015. On June 11, 2015, we submitted a draft report to DCAS with a request for comments. We received a written response from DCAS on June 25, 2015.

In its response, DCAS stated that "the findings and conclusions in the Report are based on unsubstantiated claims and lack of understanding of DCAS' role in the City's overall energy efficiency efforts." DCAS also stated that it

> made good faith efforts to bring clarity to the auditors about a very complex and specialized area of the energy management and energy efficiency sector to help them better understand the City's GHG emissions measurement and reporting methodology. However, the auditors' findings exhibit a limited knowledge of DEM's role within the larger context of the City's overall greenhouse gas (GHG) emissions reduction strategies as laid out in PlaNYC and One City: Built to Last, and in compliance with Local Laws (LL) 84 and 87 of 2009. The auditors failed to note that DEM is not solely responsible for compliance with LL 84 and LL 87 for City-owned buildings, but rather plays a key role in coordinating efforts under these laws with other City agencies. The failure to recognize the effort of other agencies in coordination with DEM calls into question the auditors' claims of 'deficiencies' in complying with these laws.

With regard to the audit's 10 recommendations, DCAS agreed with two, claimed it had already implemented five, and disagreed with three.

Auditors Comments

Rather than addressing the deficiencies identified in our audit, DCAS raises concerns that are either peripheral or completely unrelated to the central conclusion of this audit report—that DCAS-DEM has not properly overseen and managed the energy conservation efforts for City buildings. Specifically, we identified fundamental weaknesses in DCAS-DEM's governance structure, strategy planning, decision making, and its risk management of GHG reductions goal.

As noted in our audit report, DCAS-DEM's lack of written policies, procedures, and documentation has limited its ability to establish clear energy conservation goals for City buildings and to assist the City in meeting those goals. Moreover, DCAS' response to the audit contains vague, unsupported statements that rely on what DCAS asserts are "best practices." Further, we note that, although the coordination of City energy conservation efforts involved other City agencies, according its mission statement DCAS-DEM is "to serve as the hub for energy management for City government operations, from energy procurement to performance tracking, improved operations & maintenance, and building retrofits. DEM's long-term goals are to 1) ensure clean,

reliable energy to support City operations, and 2) reduce greenhouse gas emissions of operations."

Having carefully considered DCAS' response to the audit, we found no basis to alter any of our findings and recommendations. We strongly urge DCAS-DEM to enhance its internal controls through the establishment of written policies and procedures that include documentation requirements and to otherwise enhance its effectiveness and accountability by adopting our recommendations.

The full text of DCAS' response is included as an addendum to this report.

FINDINGS AND RECOMMENDATIONS

The audit found that DCAS-DEM has not consistently ensured that energy efficiency goals and measures are implemented in City buildings. In particular, DCAS-DEM lacks in-house goals for the reduction of GHG emissions and does not track the progress it has made to reduce these emissions for City buildings. Moreover, we found DCAS' reporting in MMR to be inconsistent and therefore, it is of questionable utility.

Additionally, we found the following problems in DCAS-DEM's management of energy efficiency efforts and compliance with Local Laws 84 and 87:

- Benchmarking of City buildings was incomplete.
- Data was improperly reported.
- Data was not adequately verified.
- DCAS-DEM's compliance schedule was incomplete.
- There were no official procedures for prioritizing buildings for energy efficiency projects.

We attribute many of these deficiencies to significant weaknesses in DCAS-DEM's internal controls. These include a lack of written policies and procedures and an absence of supporting documentation. As a result, DCAS-DEM's ability to oversee the City's goal of reducing municipal GHG emissions for City buildings, including compliance with the local laws, has been severely hampered.

These matters are discussed in greater detail in the following sections.

No In-House Goals to Reduce Greenhouse Gas Emissions Have Been Established

DCAS-DEM has a key role in ensuring that the energy conservation goals for City buildings in PlaNYC and the "Greener, Greater Buildings Plan" are fulfilled. Although a significant portion of the City's target reduction in GHG emissions is to be attained through its reduction of GHG emissions in City buildings, this has not been translated by DCAS-DEM into its own in-house goals. Additionally, it has not set yearly milestones for reducing GHG emissions and does not track its progress in achieving emission reductions. These deficiencies call into question DCAS-DEM's ability to effectively spearhead the City's efforts to reduce GHG emissions.

To gauge its progress in reducing emissions in accordance with PlaNYC, DCAS-DEM relies solely on annual statistics published by the Mayor's Office of Sustainability. However, these statistics do not provide information on specific City agencies' performance, so DCAS-DEM cannot identify the extent to which its actions contribute to the overall goal of reducing City government emissions.

The Mayor's Office of Long-Term Planning and Sustainability's 2013 "Inventory of New York City Green House Gas Emissions" reported that for the City as a whole, both the public and private sectors, GHG emissions reductions remained constant at 19 percent from 2012 to 2013. However, the emission reductions attributable only to City government were reported to have declined by three percent from 2012 (from 19 to 16 percent). DCAS-DEM officials attributed this

decline to an "unusually harsh winter" (i.e., because it was a colder winter, more energy was used resulting in higher GHG emissions) without offering any evidence to substantiate this conclusion. After the exit conference, DCAS-DEM provided excerpts from the 2014 Inventory of New York City Greenhouse Emissions report prepared by the Mayor's Office of Long-Term Planning and Sustainability that asserted the 3 percent increase and that it resulted from a harsh winter. However, DCAS-DEM did not provide any analysis showing the magnitude of the cold weather's impact on energy use or GHG emissions that sufficiently supports these statements. Our analysis found that nearly 28 percent of City buildings had reductions in GHG emissions during the same time period. Regardless of the weather, the City's goal of achieving a 30 percent reduction in GHG emissions by 2017 remains unchanged.

According to the Mayor's Office of Long-Term Planning and Sustainability, as of 2013 City government achieved a 16 percent reduction in GHG emissions from the 2006 baseline, which represents an average annual reduction of 2.3 percent. However, this reduction rate will not allow the City to meet its goal of achieving a 30 percent decrease from the 2006 baseline by 2017. If DCAS-DEM were to have in-house goals, it could gauge the extent of its progress in order to carry out its mission of reducing GHG emissions.

> ***DCAS Response****:* "It is standard industry practice for municipalities tracking GHG emissions to establish goals and track progress at the municipal level, not at the 'in-house' agency level. The goals are a citywide reduction of Green House Gas (GHG) emissions from City government operations of 30% by 2017, as established under *PlaNYC* and a 35% reduction by 2025, as established under *One City: Built to Last.* Furthermore, DEM is not required by law to establish in-house goals.
>
> DEM tracks progress toward the City's GHG reduction goals in two ways: (1) using data published annually by the Mayor's Office of Sustainability in the annual *Inventory of New York City Greenhouse Gas Emissions;* and (2) at the individual building project level, using estimates from energy audit reports prepared according to ASHRAE Level II standards (and design documents as projects proceed).
>
> The auditors ignored data in the *Inventory of New York City Greenhouse Gas Emissions* that explains the impact of weather on the 3% decline in GHG emissions reductions reported for FY 2013, including data demonstrating a 25% year-over-year increase in Heating Degree Days, an indicator of increased energy use for heating as compared to the previous year due to cold weather.
>
> In addition, GHG reductions do not always accrue at a constant rate; therefore, the auditors' calculation of a 2.3% average annual reduction is inaccurate. The City's GHG reduction goal was legislated in FY 2008; however, DEM didn't begin to realize GHG reductions until energy management programs were developed and projects were implemented. For example, the City is now realizing GHG emissions reductions from multi-year projects launched in the early years of *PlaNYC* that weren't completed until FY 2013 or later. The City remains committed, and continues to invest in projects to achieve its GHG emissions reduction goals."
>
> ***Auditor Comment:*** The policy identified by DCAS as "standard industry practice" does not exempt it from the necessity of establishing its own goals as a part of accountability for stewardship of its resources. Because a significant portion of the City's target reduction in GHG emissions is to be attained through its reduction of GHG emissions in City buildings, it is imperative for DCAS-DEM to be able to

independently gauge its progress and, therefore, we reiterate that it must set its own in-house goals, including yearly milestones, for reducing GHG emissions.

With specific regard to DCAS' statement that it also tracks progress toward the City's GHG reduction goals at the individual building project level by using estimates from energy audit reports, the December 31, 2014, *Local Law 87 Annual Report* states "[i]t should be noted that a precise comparison of audit estimates for energy reductions and actual energy reductions is not possible as energy usage is measured at the building level and not by individual energy conservation measures." Thus, the usefulness of these energy audit estimates appear to have limited utility absent some means to compare or reconcile them with actual performance.

While DCAS states that we ignored the impact of weather on the 3% decline, DCAS in its response failed to provide us any analysis showing the magnitude of the cold weather's impact on energy use or GHG emissions, and any explanations for reductions in GHG emissions in nearly 28 percent of City buildings (which is over 300 buildings) during the same time period.

Further, contrary to DCAS' statement, our computation of a 2.3 percent average annual reduction is what we claim—an average. We did not claim this to be a constant rate, nor did we claim that this would be the actual reduction rate in the future.

Finally, regarding DCAS-DEM's progress with "multi-year projects," the December 31, 2014, *Local Law 87 Annual Report* states that only "eight energy retrofit projects had been completed and operational for at least one year" by the end of Fiscal Year 2014. In light of this, we continue to doubt whether the City will attain its goal of 30 percent reduction in GHG emissions with only two years remaining.

Recommendations

DCAS-DEM should:

1. Establish in-house GHG emission reduction goals (annual, long-term, etc.) in consultation with the Mayor's Office of Sustainability to determine the extent to which its actions contribute to the overall City goal of reducing GHG emissions and to help ensure that the City meets its goal of reducing GHG emissions by 30 percent between 2006 and 2017.
2. Establish and document a process for determining the in-house GHG emission reductions its efforts have thus far achieved, and continue to monitor and track its progress towards further achieving its goals in accordance with this process.

DCAS Response*:* "(Recommendations #1 and #2 are addressed jointly) DEM disagrees with the auditors' recommendation that it establish separate 'in-house' GHG emissions reduction goals. It is industry practice for municipalities tracking GHG emissions to establish goals and track progress at the municipal level, not at the 'in-house' agency level. DEM uses the City's, GHG reduction goals mandated by the Mayor and the City Council as its goals: 30% GHG emissions reduction by 2017; 35% by 2025 (interim step toward 80% by 2050). DCAS pays the heat, light, and power bills for City agencies, and plays a key role in supporting City agencies

and funding energy projects initiated by City agencies; a separate DCAS-specific goal is not necessary.

DEM tracks progress toward the City's GHG reduction goals in two ways: (1) overall progress is tracked using data published annually by the Mayor's Office of Sustainability in the *Inventory of New York City Greenhouse Gas Emissions,* and (2) at the project level, using estimates from energy audit reports prepared according to ASHRAE Level II standards (and design documents as projects proceed). DEM also compares energy usage reductions in buildings where it has funded energy projects as compared to changes in the City government average energy usage, as demonstrated in the inaugural Annual Local Law 87 Report submitted to the Mayor and the City Council Speaker in compliance with LL 87."

***Auditor Comment*:** For the reasons discussed in the audit report and specifically noted in the auditor's comments above, we continue to recommend that DCAS-DEM establish in-house GHG emission reduction goals. Implementing Recommendations 1 and 2 would greatly enhance DCAS-DEM's decision-making and its ability to effectively plan. It will also enable DCAS-DEM to clearly identify and resolve potential slippage in energy use and GHG emissions reductions and, thereby, assist the City in achieving its goals set forth in PlaNYC.

Problems with Data in Mayor's Management Report

The MMR, which is mandated by the City Charter, reports on City agencies' performance. It provides the public an opportunity to evaluate agency effectiveness. Our review of statistics provided by DCAS regarding its performance in achieving energy conservation revealed several problems. Primarily, because, as described above, DCAS-DEM has not established a GHG emissions reduction goal for itself, it does not report on its effectiveness achieving this goal. Rather, it reports on other DCAS-DEM efforts, such as its estimates of annual cost savings from energy retrofit/conservation projects and its estimates of reductions in GHG emissions from energy retrofit/conservation projects. However, these reported numbers are derived from consultant projections, not actual measurements of data. These figures cannot be reconciled with those provided by DCAS-DEM to the Mayor's Office of Sustainability for its use in preparing the "Inventory of New York City Green House Gas Emissions." DCAS-DEM provides to the Mayor's Office of Sustainability actual monthly energy usage data.

We also found significant problems with the accuracy of the data presented. For example, the Fiscal Year 2013 MMR shows that by undertaking energy conservation projects, the City reduced GHG emissions by an estimated 3,325 metric tons in Fiscal Year 2012. However, in the 2014 MMR, DCAS-DEM revised this estimate of savings in Fiscal Year 2012 to 7,021 metric tons—more than doubling what was previously reported. (See Table 1.) Similarly, DCAS-DEM revised other figures in the 2014 MMR for reduced emissions that were previously reported in the 2013 MMR. Table 1 below provides a comparison of fiscal year 2010 through 2013 data as reported in the 2013 and 2014 MMRs.

Table 1

Comparison of Fiscal Year 2010 to 2013 Data as Reported in the 2013 and 2014 Mayor's Management Reports

Table 1 a.

Performance Indicator	Data for	Reported in		difference 2013 to 2014	
		2014 MMR	2013 MMR	$	%
Estimated annual cost savings from energy retrofit/conservation projects	Fiscal Year 2010	$1,730,000	$1,830,000	($100,000)	-5%
	Fiscal Year 2011	$1,110,000	$870,000	$240,000	28%
	Fiscal Year 2012	$2,570,000	$1,310,000	$1,260,000	96%
	Fiscal Year 2013	$1,840,000	$3,460,000	($1,620,000)	-47%

Table 1 b.

Performance Indicator	Data for	Reported in		difference 2013 to 2014	
		2014 MMR	2013 MMR	Metric Tons	%
Estimated reduction in greenhouse gas emissions from energy retrofit/conservation projects	Fiscal Year 2010	4,750	6,884	(2134)	-31%
	Fiscal Year 2011	2,654	2,583	71	3%
	Fiscal Year 2012	7,021	3,325	3696	111%
	Fiscal Year 2013	4,115	8,306	(4191)	-50%

Table 1 c.

Performance Indicator	Data for	Reported in		difference 2013 to 2014	
		2014 MMR	2013 MMR	Number of EERs	%
Energy retrofit/conservation projects completed	Fiscal Year 2010	34	31	3	10%
	Fiscal Year 2011	20	14	6	43%
	Fiscal Year 2012	54	39	15	38%
	Fiscal Year 2013	27	26	1	4%

Table 1 d.

Performance Indicator	Data for	Reported in		difference 2013 to 2014	
		2014 MMR	2013 MMR	Number of Projects	%
Energy Efficiency Reports (EER) completed	Fiscal Year 2010	14	14	0	0%
	Fiscal Year 2011	50	50	0	0%
	Fiscal Year 2012	101	80	21	26%
	Fiscal Year 2013	87	79	8	10%

MMR data revisions were not limited to information about reductions in GHG emissions. Statistics about cost savings resulting from energy conservation projects, numbers of projects completed, and numbers of energy efficiency reports completed were also revised. While it is incumbent upon DCAS-DEM to ensure that past performance was reported correctly in MMR data, the revisions to that data that were made, many of which are significant, call into question the reliability of the information provided by DCAS-DEM. Moreover, inconsistent and inaccurate data may mislead City authorities and the public about the effectiveness of the City's efforts to conserve energy.

When questioned about the revised data in the Fiscal Year 2014 MMR, DCAS-DEM stated that it "identified data issues, and took the initiative to restate these numbers for the 2014 MMR." However, DCAS-DEM could not provide any documentation to substantiate the basis on which it identified "data issues." Officials explained that "[t]here was no formal sign-off process associated with this work/analysis." Further, DCAS-DEM informed us that the definition of completed projects was revised so that "[i]n the 2014 MMR, DEM defined 'Completed Energy Retrofit/Conservation Projects' as projects that had reached construction completion." But DCAS-DEM officials also acknowledged that they "cannot confirm details of the methodology previously used in preparing the previous contribution to the 2013 MMR update, as that was done under a previous administration by individuals who are no longer employed with DCAS."

Extreme differences in MMR statistics were not the only data problems we found. We also could not reconcile some of the statistics in the Fiscal Year 2014 MMR with documentation that had been provided to us by DCAS-DEM. For example, although the MMR reported that 54 capital projects were completed in Fiscal Year 2012, documentation obtained from DCAS-DEM dated June 4, 2014, shows that 41 capital projects were completed that year. Similarly, the MMR reports that 50 EERs were completed in Fiscal Year 2011, while the data we received from DCAS-DEM indicated that that 27 EERs were completed. (See Table 2.) When we presented DCAS-DEM officials with these discrepancies, they stated that timing may be responsible for the differences in the data. However, that explanation alone does not appear sufficient to explain the significant variation between the information reported in the MMR and the information reflected in DCAS-DEM internal records, purportedly accurate less than one month before the June 30th end of Fiscal Year 2014.[7]

[7] Fiscal Year 2014 MMR, page numbers 285 and 286.

Table 2

Comparison of MMR and DCAS-DEM Data

	Energy Retrofit/Conservation Projects Completed			Energy Efficiency Reports (EER) Completed		
	2014 MMR	DEM Completed Capital Projects (June 04 2014) *	% difference DEM list to 2014 MMR	2014 MMR	Completed EER List (June 2014) *	% difference DEM list to 2014 MMR
FY10	34	39	15%	14	0	-100%
FY11	20	20	0%	50	27	-46%
FY12	54	41	-24%	101	79	-22%
FY13	27	28	4%	87	110	26%
FY14	21	26	24%	70	99	41%

* denotes list given to us by DCAS-DEM

***DCAS Response**: "*DEM's use of consultant estimates for greenhouse gas emissions reductions is standard industry practice. The estimates are used to identify the projected impact of the efficiency measures independent of the impact of other variables (e.g., changes in weather, building occupancy, or building use). The estimates are not intended to reconcile with the aggregate data published in the *Inventory of New York City Greenhouse Gas Emissions* which is based on actual energy usage and is derived from actual energy bills and other pertinent data.

DEM applied an updated and more precise methodology for the FY 2014 Mayor's Management Report (MMR) data to more effectively capture project completion dates, cost savings, and energy efficiency data, because the methodology used in preparing the MMR data published under a previous administration was unclear. DEM then applied the revised methodology to the prior Fiscal Years and restated the data in the FY 2014 MMR for consistency. This allows for more accurate comparability across multiple years. At the time of resubmission, DEM clearly stated that the numbers had been revised. Given this, Table 1 in the Audit Report should be disregarded, as the comparison to FY 2013 is invalid.

In the example the auditors present in Table 2, what is described as 'extreme' differences is actually miniscule when the data is aggregated across the five Fiscal Years 2010 through 2014. When comparing the aggregate projects listed in the MMR to the list of projects previously provided to auditors by DEM, the aggregate change is approximately 1%, and the aggregate change in the EER data is approximately 2%. This is due to the proper identification of project completion and allocation across the fiscal years."

Auditor Comment: Even though as DCAS states that "[t]he estimates are not intended to reconcile with the aggregate data published in the *Inventory of New York City Greenhouse Gas Emissions,*" DCAS-DEM should be able to assess the impact of their actual performance compared to consultant estimates. Thus, we disagree with DCAS' response.

Further, although DCAS claims that it “applied an updated and more precise methodology for the FY 2014 MMR data,” it did not provide details of the new methodology. Moreover, it did not provide the analysis/work it performed to arrive at the new numbers and, as previously noted, officials explained that "[t]here was no formal sign-off process associated with this work/analysis." DCAS states in its response that “the methodology used in preparing the MMR data published under a previous administration was unclear.” This highlights the need for formal written procedures to ensure consistency, accountability, and a continuity of knowledge across administrations.

Although DCAS questions the utility of Table 1, we note that it is an accurate representation of information presented to the public from one year to the next. Thus, the information provided in it is relevant and the comparison is valid.

In addition, with regard to the information provided in Table 2, our concern is with the accuracy of the data DCAS-DEM presented individually year-to-year and not the accuracy of the data in the aggregate. It is certainly problematic that there could be such significant changes in these figures in under a month. Additionally, it should be noted that DCAS-DEM failed to provide us with documentation supporting the numbers presented in the 2014 MMR.

Recommendation

DCAS-DEM should:

3. Establish formal written policies and procedures, including detailed definitions, that explain how the indicators presented in the Mayor's Management Report are computed. These policies and procedures should also establish a timeframe for the retention of documentation associated with these computations.

   DCAS Response: ***“***In accordance with the objectives of the current DCAS administration DEM is evaluating its contributions to the Mayor's Management Report and has discussed proposed changes with the Mayor's Office of Operations intended to better reflect its programs. The documentation procedures associated with MMR reporting is part of this process.”

Deficiencies in Complying with Local Law 84

Incomplete Benchmarking Results

Based on the results reported by DCAS-DEM on its benchmarking efforts from 2010 to 2013, we were unable to determine whether it is fulfilling its obligation to benchmark all required City buildings in accordance with LL 84, section 28-309.3. That section of the law requires that,

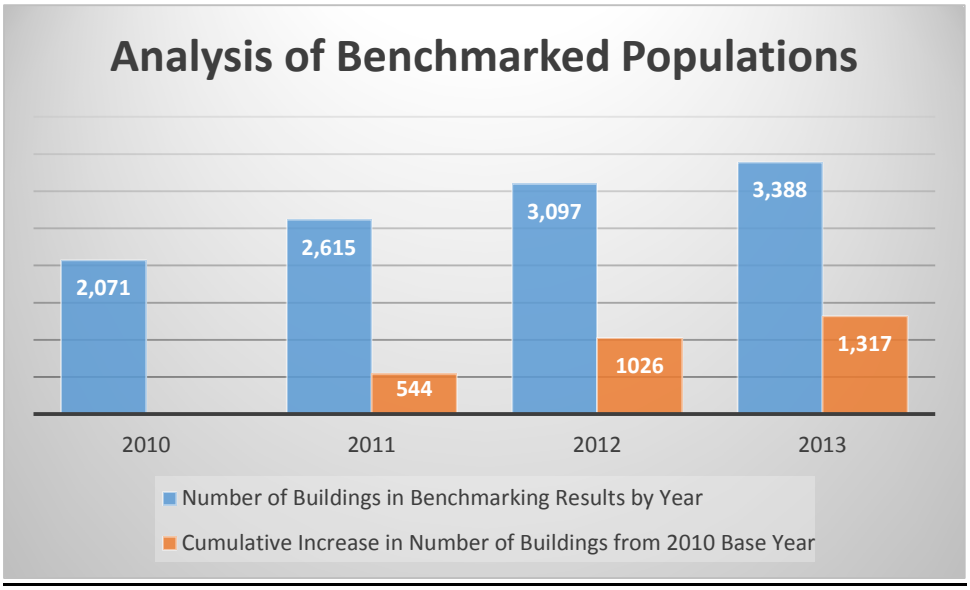
> [n]o later than May 1, 2010, and no later than every May first thereafter, any city building shall be benchmarked by the agency or entity primarily responsible for the management of such building, in

coordination with the department of citywide administrative services with respect to energy use.[8]

However, due to the wide variances in the numbers of buildings DCAS-DEM reported benchmarked during the years we looked at, we question the integrity of the data reported.

The benchmarking results are a listing of all City buildings showing each building's Energy Use Intensity (EUI) and GHG emission rate.[9] DCAS-DEM's benchmarking results for 2010 contained a list of 2,071 buildings; by 2013, that number had increased to 3,388 buildings. Thus, the benchmarking list increased by 1,317 buildings that were not contained in the 2010 results (See Chart 1).[10] Overall, between 2010 and 2013 the number of benchmarked buildings increased cumulatively by 39 percent.

Chart 1



While we expect that buildings may have been added or removed from the City's inventory since 2010 and so the number of buildings to be benchmarked would vary from year to year, a building increase of 39 percent over three years does not seem realistic. When asked about the large inventory increases, DCAS-DEM officials stated that the "2010 benchmarking captured all buildings that were then identified as requiring benchmarking." DCAS-DEM officials conjectured that since 2010, buildings may have been added, deleted, or split into more than one building due to sub-metering.[11] However, they were unable to identify buildings that fell under these categories, or to provide any evidence to verify the completeness of any of the benchmarking

[8] DCAS-DEM officials explained that (except for DOE buildings), DCAS-DEM benchmarks buildings for which it pays energy bills (electricity, natural gas, steam).
[9] EUI represents a building's energy use in terms of its size and is expressed as energy per square foot per year. A low EUI signifies efficient energy performance.
[10] Our review identified six buildings operated by the City's Department of Environmental Protection that should not have been included in the benchmarking results because they were located outside New York City and consequently, not listed in Department of Finance records, as required under LL 84.
[11] Sub-metering is the installation of metering devices to measure actual energy consumption after the primary utility energy meter. Sub-metering facilitates monitoring energy usage to account for buildings' actual energy usage.

results in any given year.[12] Consequently, we have no means of verifying their explanations for the significant increases to the building population requiring benchmarking and therefore question the integrity of the data overall.

> ***DCAS Response:*** "DEM has successfully complied with the requirements of LL 84. The benchmarking results include a full list of applicable City buildings drawn from a number of sources including Department of Finance (DOF) records and information provided directly by other City agencies. As allowed by LL 84, DEM updated its methodology from benchmarking groups of buildings on a tax lot (Borough/Block/Lot, a.k.a. BBL) in 2010 to individual buildings (Building Identification Number, a.k.a. BIN) starting in 2011 and going forward.
>
> What looks like a 39% increase in the number of buildings is simply the result of DEM's efforts to get more granular data by dissecting tax lots and campus settings into individual buildings where possible. In addition, DEM took the initiative to include some smaller buildings that are not *required* to be benchmarked under the law, as the inclusion of these buildings can prove to be useful tool."
>
> ***Auditor Comment***: DCAS-DEM's claim that an "updated methodology" would account for increase of 1,317 buildings from 2010 to 2013 appears unlikely to actually account for the significant increase in the numbers of buildings identified between the years. Although DCAS-DEM claims that the methodology was changed in 2011, we still found an increase of 773 buildings from 2011 to 2013. DCAS-DEM has provided no documentation evidencing that the methodology change (along with the inclusion of some smaller buildings) accounts for an increase of this magnitude.

Misrepresented Energy Data

Many City buildings are arranged in "campus" formations, in which a facility such as a water treatment plant may contain multiple buildings on its site that share a single gas, electric and/or water meter. We identified that 1,400 (41 percent) of the 3,388 buildings in the 2013 DCAS-DEM benchmarking results were arranged in campus formations. Even in such shared metering situations, DCAS-DEM separately lists benchmarking results for every building in a campus. However, our analysis of those results indicates that the energy performance data for each building within a campus is identical, which does not appear reasonable based on the variations of the types, sizes and uses of these multiple buildings. Accordingly, DCAS-DEM's practice of attributing identical energy usage to each building could provide misleading information about the actual energy use by individual buildings, which can vary greatly. Moreover, we found that several campuses report square footage for only one or a few buildings within the campus while leaving the square footage for each of the remaining buildings blank. Therefore, our analysis does not support DCAS-DEM's explanation that campus buildings were assigned metrics based on a pro-rated square foot basis.

For example, the Newtown Creek Water Pollution Control Plant lists 30 buildings as being part of the campus. A review of the data reported by DCAS-DEM revealed that square footage information was listed for only six of the 30 buildings. The square footage of these six buildings ranged from 24,089 to 1,306,271, while no square footage was reported for any of the remaining

[12] At the exit conference, DCAS-DEM stated that different methodologies were used for benchmarking in 2010 and 2011. In addition, DCAS-DEM submitted an "Annual Benchmarking Process Overview" (dated 2014), and an analysis of 2010 benchmarking showing the methodology used in 2010; however, it could not provide a reconciliation for the buildings benchmarked during 2010 through 2013.

24 buildings. However, as reported by DCAS-DEM, the EUI and GHG emissions performance metrics for each building were identical. In another example, the Port Richmond Water Treatment Control Plant contains six buildings collectively totaling 80,000 square feet. However, 80,000 square feet was listed as the square footage for a single building while no square footage for the remaining five buildings was listed. DCAS-DEM reported identical energy performance metrics for each of the six buildings. Similarly, the Fire Department's Academy at Randall's Island contains 44 buildings totaling 188,758 square feet. Again, the 188,758 square feet was listed for only one building while no square footage was provided for any of the remaining 43 buildings. Each building is identified as having identical energy performance metrics. This is highly questionable since one building is an administration building and another is identified as an engineer's trailer.

Further, our analysis could not determine whether campus buildings' performance metrics had been obtained from one main meter reading sub-divided equally among each of the buildings or whether the entire meter reading was recorded each time for every building. If the latter method has been used, these buildings' benchmarking data would reflect substantially higher energy use than actually occurred. DCAS-DEM could not tell us which method had been used.

> ***DCAS Response****:* "The auditors' statement that DEM misrepresented data is disingenuous, and is not supported by the evidence. The fact that the auditors disagreed with our methodology does not constitute misrepresentation. Rather, it is a conclusion based on mere opinion.
>
> LL 84 allows benchmarking by campus, i.e., where meters are shared by multiple buildings. DEM has appropriately represented energy data for campuses, which cannot be as easily and clearly presented as individual buildings. The calculations of benchmarking scores are performed by the US EPA ENERGY STAR Portfolio Manager tool, used by governments nationwide. These data are based on actual energy billing information; therefore the scores do not distort the overall result.
>
> As more sub-meters are installed and more granular data become available, DEM will further refine the methodology for benchmarking campuses. The benchmarking results are published annually, with the prior year's results, as well as each preceding year back to 2010. DEM also notes in its annual benchmarking report on the DOF web site that the information in the report is subject to change due to ongoing data quality improvements, energy efficiency and conservation efforts, and changes in building use over time."
>
> ***Auditor Comment:*** DCAS-DEM has failed to understand the substance of the concerns we raise in our finding, which is the data presented in the performance metric. We found that identical energy performance metrics were reported for each building within a campus regardless of size, type, or use in the 2013 benchmarking results. As previously discussed in the audit report, DCAS-DEM officials told us that campus buildings were assigned metrics based on a pro-rated square foot basis. However, that was clearly not the case. When questioned, DCAS-DEM did not know whether the energy data listed was attributable to one meter divided equally across all buildings within the campus or if it was repeating the total energy use for all buildings within the campus. If DCAS employed the latter methodology then, as indicated earlier, the Fire Department's Academy at Randall's Island consisting of 44 buildings, for example, would be reporting 44 times the amount of energy usage than actual.

Department of Education Data Not Verified

DCAS-DEM does not verify the accuracy of school buildings' energy performance metric data, which DOE reports in the EPA's Portfolio Manager. EUI and GHG emission performance metrics for DOE buildings are incorporated into the DCAS-DEM benchmarking results. Our analysis of 2013 data shows that 42 percent of the City's benchmarked buildings fall under DOE, and they generated 34 percent of the total GHG emissions for benchmarked buildings. Given that DOE buildings use a significant amount of energy and contribute a large share of GHG emissions, DCAS-DEM should consider verifying the accuracy of the information that DOE reports. Ensuring benchmarking results' accuracy of data uploaded by DOE into the EPA's Portfolio Manager is important for DCAS-DEM to successfully carry out its mission of managing and tracking the City's energy performance.

> ***DCAS Response****:* "A secondary DEM review of the Department of Education's (DOE) benchmarking data is not required for compliance with LL 84, nor would it be a prudent use of City resources to duplicate DOE's efforts. In fact, DOE has a benchmarking analyst as part of its energy team to perform this function. DOE uploads its benchmarking data directly into the US EPA's web-based Portfolio Manager tool as part of the City's submission. Notably, the auditors did not identify any problems with the DOE data."
>
> ***Auditor Comment:*** Because DOE buildings constitute 42 percent of the City's benchmarked buildings and use a significant amount of energy and contribute a large share of GHG emissions, it would be vital for DCAS-DEM, as the oversight and reporting agency, to verify the accuracy of the information that DOE reports. While we believe that employment of a benchmarking analyst by DOE would be very helpful, we note that during course of the audit DCAS-DEM did not disclose that that such an analyst was employed at DOE or provide information about his/her functions.

No Evidence That Extreme Fluctuations in Energy Use and GHG Emissions Were Investigated

Our analysis of benchmarking results indicates that, according to the information DCAS-DEM has reported, many City buildings exhibited extreme annual fluctuations in their use of energy. In all cases, DCAS-DEM could not provide evidence to show that it investigated the causes of the fluctuations. EUIs and GHG emissions increased by more than 80 percent for 16 buildings, according to benchmarking results for 2012 and 2013. (See Appendix I for a list of the buildings.) Some of these include:

- increases in EUI of 282 percent and GHG emissions of 795 percent in the Department of Sanitation's Brooklyn South 13 District Garage;
- increases in EUI of 111 percent and GHG emissions of 277 percent in the Pelham Fritz Recreation Center in Manhattan; and
- increases in EUI of 146 percent and GHG emissions of 242 percent in the Queens Borough Hall.

An additional 75 buildings had GHG emissions increases that were over 80 percent.

When we informed DCAS-DEM of the large jumps in some of the benchmarking data, officials responded that, although some fluctuations are to be expected, DCAS-DEM identifies and

resolves extreme swings, and addresses "apparent anomalies" as "time and resources permit." However, DCAS-DEM has not established parameters to define what it considers "extreme fluctuations" in energy usage or GHG emissions. Moreover, although DCAS-DEM stated that extreme fluctuations are usually related to data problems that are normally resolved within two weeks, it was unable to provide either written procedures for resolving such anomalies or specific documentation to support its assertion that it investigated and addressed any extreme fluctuations and data problems. DCAS-DEM officials stated that they conduct telephone conversations with officials of other agencies to investigate fluctuations. However, they were unable to provide us with documentation of such efforts, such as logs or written notes of telephone calls or e-mails to agencies.

To ensure that the City fulfills its energy conservation and GHG emission reduction goals, DCAS-DEM should investigate and deal with large fluctuations in building energy use. Simply documenting the energy fluctuation information in the benchmarking database does not further DCAS-DEM's mission to oversee and track energy performance and reduce GHG emissions.

> ***DCAS Response**: "*The investigation of fluctuations in energy use is an ongoing effort in which DEM plays a role in coordination with each agency's designated Energy Liaison Officer (ELO). Agency ELOs serve as a point of contact for all utility billing issues, and have prime responsibility for reviewing monthly energy reports, monitoring billing, and reporting changes or errors in the Agency's utility accounts to DEM.
>
> **Methodology/Data Improvements:**
>
> The changes in data for the 16 buildings identified in Appendix I of the Audit Report actually reflect data improvements, ***not*** GHG emissions increases in excess of 80% as the auditors have asserted. Reasons for fluctuations for the buildings in question include:
>
> - The 2013 benchmarking data reflected an improved methodology for capturing fuel oil data.
> - Building occupancy or use changed:
>   - McCarren Park Pool Complex (building #14 on the Appendix 1), was just a concert venue in 2011, and then added a swimming pool, and an ice rink in 2012 and 2013.
>   - Recreation centers and garages have fluctuating energy use profiles due to the nature of the building/facility use (e.g., garage doors frequently opening and closing, energy-intensive equipment such as swimming pools).
>
> The 2013 data is a better representative baseline compared to 2012, and subsequent years will provide an even better basis for comparison.
>
> **Investigation of Energy Use Fluctuations:**
>
> The auditors' suggestion that DEM investigate fluctuations in energy use based on benchmarking results is not in keeping with best practices. Benchmarking is a

lagging indicator based on year-old data. Instead, the City tracks energy use and investigates fluctuations on the front end, through monthly utility bills and energy reports.

Every agency has an Energy Liaison Officer (ELO) who is responsible for monitoring monthly energy use reports, in accordance with the guidelines laid out in the *Energy Management Guide for ELOs,* which was provided to the auditors. Tracking fluctuations in energy use on a decentralized basis through the energy bills is the most effective and direct way to identify and resolve issues closer to real-time. ELOs have prime responsibility for managing their agency's energy billing, reviewing monthly energy reports, and reporting errors in utility accounts to DEM, serving as points-of contact on energy-related issues within the Agencies."

Auditor Comment: DCAS in its response relies on what it contends are "best practices," but failed to provide any support for the existence and implementation of such practices. We note that if using the Energy Liaison Officers to track energy fluctuations was truly the most effective way to identify and resolve issues, then these extreme energy fluctuations would have been identified, documented and resolved. However, we did not find that this had in fact occurred.

DCAS-DEM stated that it "addresses anomalies as time and resources permit." Given this information, a list of buildings that reported extreme fluctuations in their performance metrics, one of which had an energy use increase of over 692%, was submitted to the DCAS-DEM with a request to provide documentation to verify that it was investigating these anomalies. DCAS-DEM was unable to provide any written documentation that it was investigating or had investigated these energy fluctuations. DCAS-DEM provided only one anecdotal example regarding the change of usage in the McCarran Park Pool Complex. Since DCAS-DEM was unable to provide written evidence during the course of the audit, it subsequently modified its original statement regarding investigating extreme fluctuations at the May 29, 2015, exit conference to state they investigate fluctuations, as time and resources permit, "sometimes."

DCAS' statement that "the changes in data for the 16 buildings identified in Appendix I of the Audit Report actually reflect data improvements, *not* GHG emissions increases in excess of 80%" makes little sense in light of the data provided. The percentages are directly computed from the data presented in the 2013 benchmarking results. No documentation of "an improved methodology for capturing fuel oil data" was provided. Even allowing for this supposed "improved methodology," it would account for only a minor portion of the increases identified in Appendix I since fuel oil accounted for less than 20% of the total GHG emissions for City buildings in 2013. Additionally, no documentation of changes in building occupancy and/or use was provided to us by DCAS-DEM. Finally, although buildings of a certain nature may have "fluctuating energy use profiles," these fluctuations are generally of a more seasonal nature. For example, a swimming pool will be used every summer. Documentation of the reasons for the fluctuations in these buildings would facilitate DCAS-DEM's efforts to effectively prioritize investigations of energy use fluctuations.

Recommendations

DCAS-DEM should:

4. Comply with Local Law 84 by ensuring it includes all the required buildings in its benchmarking. To determine which buildings must be included, DCAS-DEM should establish procedures to ensure that it has and maintains an accurate inventory of such buildings.

   DCAS Response: "DEM already complies with Local Law 84 annually. It is DEM's existing practice to include all required buildings in benchmarking, and further, to include some additional buildings that are not required to be included under the law, as an additional tool.

   DEM already has procedures in place for determining which buildings must be included, (e.g., Department of Finance (DOF) records, supplemented by input from City agencies)."

   Auditor Comment: We understand the "existing practice" and nonetheless maintain that DCAS-DEM needs to establish formal written procedures to ensure that it develops and maintains a complete and accurate inventory of all buildings required to be benchmarked. DCAS-DEM should keep records of building additions, deletions, etc. to facilitate the reconciliation of benchmarking results from one year to the next.

5. Establish written procedures and a methodology for benchmarking buildings associated with campuses (e.g., multiple buildings with shared energy meters) and ensure that data is accurately measured and recorded.

   DCAS Response: "DEM accurately measures and records the required data for campuses. DEM has procedures for benchmarking campuses, and will further refine and document the methodology as additional sub-meters are installed and more granular data become available."

   Auditor Comment: As discussed in the audit finding, data for campuses is not being correctly reported. Identical energy performance metrics were reported for each building within a campus regardless of size, type, or use in the 2013 benchmarking results. DCAS-DEM needs to address this deficiency through the establishment of written procedures and a methodology for benchmarking buildings associated with campuses.

6. Establish written procedures to address extreme fluctuations in City buildings' energy consumption, including assigning specific numeric parameters (i.e., tolerances) to define an extreme fluctuation in energy usage or GHG emissions. In addition, maintain sufficient documentation to show the results of investigations into fluctuations.

   DCAS Response: ***"***a. Fluctuations in City buildings' energy use are addressed with Energy Liaison Officers (ELO) during the monthly review of agencies' energy bills. The auditors' suggestion that DEM investigate fluctuations in energy use based on benchmarking results is not in keeping with best practices. Benchmarking is a lagging indicator based on year-old data. Instead, the City tracks energy use and investigates fluctuations on the front end, through monthly utility bills and energy reports.

b. Written procedures to address fluctuations in City buildings' energy consumption, including numeric parameters, already exist in the *Energy Management Guide for Energy Liaison Officers (ELOs)*.

c. Fluctuations in benchmarking results reflect a snapshot of a building's energy use and GHG emissions performance relative to other buildings for a specific period of time, on a lagging basis; benchmarking results should be expected to reflect fluctuations."

Auditor Comment: As previously noted, if using the Energy Liaison Officers to track energy fluctuations was truly the most effective way to identify and resolve issues, then these extreme energy fluctuations would have been identified, documented and resolved. Specifically because the benchmarking results provide a picture of a full year's performance, an analysis of variations in the data would capture any compounding effect that a month-to-month review might fail to uncover. As the oversight and reporting agency, DCAS-DEM has a responsibility to ensure the quality of the benchmarking data (for comparative purposes as well as addressing variances through documenting reasons) so that its benchmarking reports are correct, and, therefore needs to have procedures in place to define, identify, and address extreme fluctuations in energy usage or GHG emissions.

7. Verify the accuracy of the benchmarking data DOE reports.

DCAS Response: **"**DEM disagrees with the recommendation that it duplicate the efforts of the DOE energy staff. It would not be a prudent use of City resources to have a DEM employee replicate the work already performed by energy professionals at DOE in compliance with LL 84 of 2009. DOE employs a team of energy personnel funded by DEM, including a Benchmarking Analyst, and has extensive experience in benchmarking."

Auditor Comment: As the oversight and reporting agency, DCAS-DEM has a responsibility to ensure that its benchmarking results are correct and, consequently, should verify the accuracy of the information that DOE reports.

Deficiencies in Complying With Local Law 87

Incomplete Compliance Schedule

The compliance schedule that DCAS-DEM submitted to DOB did not contain all required City buildings. Under LL 87, by December 31, 2011, DCAS-DEM was required to deliver to DOB a schedule showing the first due dates for EERs for City buildings, commencing with Calendar year 2013 and ending with Calendar year 2022.

The schedule should have included those "requiring energy audits and retro-commissioning of the building systems" and/or those requiring retro-fitting and was to encompass "(i) a building that exceeds 50,000 gross square feet or (ii) two or more buildings on the same tax lot that together exceed 100,000 gross square feet."[13] Despite this requirement, DCAS-DEM has submitted only a partial schedule.

[13] For LL87, a City building does not include any building managed by the New York City Health and Hospitals Corporation, any senior college in the City University of New York system, cultural institutions, or other exceptions stated in the law.

According to DCAS-DEM, the compliance schedule it provided to DOB in the required time frame containing 478 buildings was based on its 2010 benchmark results.[14] However, our review of the 2,071 buildings listed in the DCAS-DEM 2010 benchmarking results indicated that 1,276 of those building should have been included in the compliance schedule because they fit the Local Law's definition for inclusion. Thus, 798 of the 1,276 benchmarked buildings were omitted.

The buildings that were not included in the schedule consisted of:

- 724 buildings whose area based on square footage qualified them for inclusion (i.e. area of a building exceeded 50,000 square feet).
- 74 buildings whose area combined with the area of other buildings in the same tax lot qualified them for inclusion (i.e., area of two or more buildings on the same tax lot that together exceeded 100,000 square feet).

Further, DCAS-DEM has never submitted a revised compliance schedule to DOB although, by its own reporting as discussed above, its inventory increased in later benchmarkings and its internal prioritization of buildings for EERs may have changed, as is discussed below.

> ***DCAS Response****:* "Prior to this audit, DEM was already in the process of developing a revised compliance schedule, which was submitted to the Department of Buildings (DOB) on June 4, 2015.
>
> DEM disagrees with the auditors assertion that 798 "buildings listed in the 2010 benchmarking results should have been included in the compliance schedule" were omitted.
>
> - Of the 798 buildings in question, the majority were included in a compliance schedule submitted directly to the DOB by the School Construction Authority (SCA), for which SCA planned to submit the EERs.
>
> - Most of the others were exempted from compliance with LL 87, and/or unique building/structure types not conducive to EERs (e.g., public bathrooms in Central Park)."
>
> ***Auditor Comment:*** We are pleased that DCAS-DEM has chosen to submit a revised compliance schedule to DOB. However, we note that contrary to DCAS-DEM's claim that it was in the process of developing a revised compliance schedule prior to the audit, on October 17, 2014, DCAS-DEM officials told us that they had not revised the schedule yet and made no mention of a revision being underway. Additionally, DCAS-DEM has not provided us with a copy of the revised schedule, although the audit exit conference was held on May 29, 2015, just prior to the claimed submission date.
>
> Although DCAS-DEM states that majority of the 798 buildings were DOE buildings that were "included in a compliance schedule submitted directly to the DOB by the School Construction Authority (SCA)," we found that the DCAS-DEM Compliance Schedule contained 339 DOE buildings. We question why these DOE buildings were included on the DCAS-DEM compliance schedule if SCA had submitted its own

[14] The compliance schedule as provided to us by DCAS-DEM contained 485 buildings. However, it included two duplicate entries, and five buildings that were not in the benchmark results. After adjusting for these seven entries, the compliance schedule was comprised of 478 buildings that were on the benchmark results.

schedule. Moreover, DCAS-DEM has not provided us with a copy of the compliance schedule that SCA purportedly submitted directly to DOB.

Additionally, we performed a thorough review of the 2010 Benchmarking Results to identify all buildings that met the criteria for the LL87 Compliance Schedule. This detailed analysis identified 798 buildings that, although they met the criteria, were not included on the DCAS-DEM Compliance Schedule.

No Formal Method for Selecting Buildings for Energy Audits

DCAS-DEM has failed to develop a formal, written methodology for determining how to prioritize the selection of buildings to undergo energy audits and retro-commissioning. DCAS-DEM officials, however, stated that they do, in fact, prioritize buildings annually based on criteria such as benchmarking results, ensuring a diversity of City agencies, the anticipated ability to obtain the greatest reduction in GHG emissions per dollar spent, EUI, and Energy Star Rating.[15]

Despite DCAS-DEM's claim to have a methodology to prioritize energy projects, we did not find any evidence that an actual methodology existed. Moreover, our review of Energy Star Ratings for buildings in the 2010 benchmarking results suggests that buildings with the lowest ratings, indicating inefficient energy use, were not given priority in the compliance schedule. (See Table 3.) (Buildings receive an Energy Star score ranging from 1, the lowest score, to 100.) Thus, 29 of 41 (71 percent) buildings with the lowest Energy Star Rating of "1" were not included in the schedule and therefore, not slated for energy saving improvements. Additionally, we found that several City agencies were either under-or-over represented in the schedule based on their relative share in the benchmarking results and thus, there was no evidence that all agencies were fairly represented.

After the exit conference, DCAS-DEM provided an "EER Prioritization and Project Selection Process Overview (LL87 Retrofit Projects)," derived from flowcharts DCAS-DEM prepared during the course of the audit. However, DCAS-DEM did not provide any substantiating evidence showing how buildings on the compliance schedule submitted to DOB were in fact prioritized.

[15] Energy Star Rating is a measure of a building's energy usage in comparison to similar buildings nationwide.

Table 3

Comparison of Benchmarking and Compliance Schedule Results with Energy Star Ratings

Buildings				
With Energy Star Rating* of	In Benchmarking Results	In Compliance Schedule	Not in Compliance Schedule	Not in Compliance Schedule
1	41	12	29	71%
2	13	5	8	62%
3	16	3	13	81%
4	8	5	3	38%
5	12	3	9	75%
6	10	6	4	40%
7	6	1	5	83%
8	8	0	8	100%
9	7	1	6	86%
10	6	3	3	50%

*Buildings receive a rating on a scale of 1 to 100; 1 is considered the lowest score.

***DCAS Response**: "*DEM provided the auditors with written details and flowcharts of the EER and LL 87 project prioritization processes, and explained its process for selecting buildings for EERs and LL 87 projects in a meeting; however, the auditors continue to confuse EERs and energy projects. DEM follows its prioritization processes that take into account a number of technical and logistical factors including, but not limited to:

- Budget availability
- Building energy performance including utilization of benchmarking scores
- Relative cost-effectiveness and feasibility of potential projects
- Age of building equipment and systems
- Aggregate energy use/GHG emissions reduction potential
- Agencies' priorities and recommendations based on their experience as the managers of City buildings

Most of the buildings in Table 3 of the audit report were not overlooked, but were school buildings (part of the portfolio of buildings that were to be addressed by the SCA on behalf of the City).

As DEM explained to auditors, which City agency manages a building is irrelevant to the technical and other criteria used to prioritize EERs or projects."

Auditor Comment: Beginning with the audit engagement letter, we requested written policies and procedures "relevant to the planning and undertaking capital improvements that increase energy efficiency." At the June 17, 2014, walkthrough with DCAS-DEM officials, we requested flowcharts of its processes. However, DCAS-DEM did not provide us with flowcharts until October 7, 2014. (It should be noted that DCAS-DEM only prepared its flowcharts after we submitted to it for confirmation detailed flowcharts we had prepared based on the verbal representation of DCAS-DEM officials as to the procedures they followed.) After the exit conference, DCAS-DEM sent us "Written procedures for DEM benchmarking and EER/project selection processes" that it "pulled from information already provided in flowcharts." Thus, it is apparent that DCAS-DEM did not have formal written policies and procedures for the selection of buildings to undergo energy audits and retro-commissioning.

Our audit found that some of the buildings with the most critical needs were not scheduled to undergo the EER process. Regarding DCAS-DEM's statement that most of these buildings were "part of the portfolio of buildings that were to be addressed by the SCA on behalf of the City," we previously noted that 339 DOE buildings were included on the DCAS-DEM Compliance Schedule and we were never given a copy of (or even made aware of) the compliance schedule that SCA purportedly submitted directly to DOB.

Recommendations

DCAS-DEM should:

8. Revise its compliance schedule so that it is complete and submit that schedule to DOB.

   DCAS Response: ***"***DEM had an updated LL 87 compliance schedule in-progress prior to receipt of the Audit Report; the revised schedule was submitted to the DOB on June 4, 2015."

   Auditor Comment: We are pleased that DCAS-DEM agrees with our finding and has submitted a revised compliance schedule to DOB. During our audit scope period, no new Compliance Schedules were submitted by DCAS-DEM to DOB. However, contrary to DCAS-DEM's claim that it was in the process of developing a revised compliance schedule prior to the audit, on October 17, 2014, DCAS-DEM told us that it had not revised the schedule yet and made no mention of a revision being underway.

9. Submit revised compliance schedules to DOB on an annual basis to reflect changed conditions such as building additions, deletions or sub-meterings.

   DCAS Response: ***"***DEM disagrees. Annual submission of revised compliance schedules for EERs to the DOB is neither required under Local Law 87, nor necessary, as there are not changes significant enough to merit a new schedule on an annual basis. DCAS will continue to submit revised compliances schedules to DOB as warranted, in compliance with the law."

Auditor Comment: Annual revisions of the compliance schedule will ensure that it is consistent with DCAS-DEM planning and inventory changes. Additionally, it may expedite the upgrades of buildings with the most critical needs in terms of energy usage and GHG emissions.

10. Develop formal policies and procedures for prioritizing buildings for Local Law 87 compliance.

DCAS Response: **"**DEM already has and follows guidelines and processes for prioritizing buildings for LL 87 compliance which is documented in flowcharts that were shared and discussed with the auditors. DEM examines several factors in the selection and prioritization of energy retrofit projects for LL 87 compliance including relative cost-effectiveness and feasibility of potential projects in addition to cost per metric ton of GHG emissions reduced and overall GHG emissions reduction potential. We would note that 'policies' for prioritizing buildings for energy efficiency reports are not defined in the law."

Auditor Comment: The flowcharts to which DCAS' response refers were prepared by DCAS-DEM only after we submitted for confirmation detailed flowcharts we had prepared. Our flowcharts were based on the verbal representation of DCAS-DEM officials as to the procedures they followed. Please refer to additional Auditor Comment above for further detail.

DETAILED SCOPE AND METHODOLOGY

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. This audit was conducted in accordance with the audit responsibilities of the City Comptroller as set forth in Chapter 5, §93, of the New York City Charter. This audit was conducted by auditors with engineering backgrounds.

The scope of this audit covers buildings for which DCAS-DEM was responsible for LL84 and LL87 compliance from January 2010 through December 2014.

We obtained background information about DCAS-DEM from its website and the Mayor's Management Report. This provided us with a knowledge of DCAS-DEM's mission, responsibilities, and functions.

To understand the policies, procedures, and regulations governing the reduction of GHG emissions by municipal buildings, we reviewed:

- Executive Order No. 109 dated October 22, 2007, which set out goals for reducing city government energy consumption and greenhouse gas emissions and required short term and long term action plans to be developed.
- LL 22 of 2008 (and the prior LL 55 of 2007 it replaced), known as the New York City Climate Protection Act, which established the goals for citywide reduction and city government reduction in GHG emissions.
- PlaNYC April 2011 Update to understand its initiatives and also the mechanisms for achieving reductions in energy consumption and GHG emissions reductions.
- "Greener, Greater Buildings Plan" enacted in 2009 to learn how energy efficiency in large existing buildings is being targeted.
- LL 84 of 2009 to understand the benchmarking requirements.
- LL 85 of 2009 which established a local energy code.
- LL 87 of 2009 to understand the requirements for energy audits, retro-commissioning, and retro-fitting.
- LL 88 of 2009 which requires the upgrading of lighting and provision of electrical sub-meters.
- PlaNYC Progress Report 2014 to determine what progress has been made in achieving the PlaNYC initiatives.
- "Inventory of New York City Greenhouse Gas Emissions" issued in December 2013 and November 2014 to assess progress towards meeting reduction goals.
- "One City Built to Last" dated September 21, 2014, to learn the most recent goals and strategies regarding energy consumption and GHG emissions reductions.

To understand DEM's organization and internal controls, we reviewed DCAS and DEM organizational charts and DCAS-DEM developed flowcharts: Benchmarking Process Flowchart, EER Process Flowchart, and Project Selection and Design Process Flowchart.

We interviewed DCAS-DEM officials numerous times to obtain a clear understanding of DEM's processes, responsibilities, and internal controls. We documented these interviews in memoranda that DCAS-DEM officials reviewed and confirmed as accurate. The meetings often resulted in follow-up questions and/or information requests from us, to which DCAS-DEM responded either in writing or at a later meeting. Subsequently, we documented our understanding of the internal controls and our assessment of the risk of fraud in a memorandum.

We also met with OLTPS (currently known as the Mayor's Office of Sustainability) to discuss how data provided by DCAS-DEM is used when preparing the Inventory of New York City Greenhouse Gas Emissions.

DCAS-DEM provided various data to us including:

- a list of capital projects underway as of June 4, 2014;
- a list of completed capital projects as of June 4, 2014;
- a schedule for LL87 compliance that specified EER due dates dated December 22, 2011;
- a list of completed EERs dated June 30, 2014; and
- benchmarking results for 2010 through 2013—some of which were also available on the DCAS-DEM website and DOF website.

The 2010 benchmark results were analyzed for data reliability and compliance with LL 84. The 2010 benchmarking results were the focus of this work, since we were told by DCAS-DEM officials that it was used to develop the schedule for LL 87 compliance. The 2010 population was compared to that of subsequent years to determine whether a complete population had been captured. The LL 87 compliance schedule was tested against the 2010 benchmarking for completeness and accuracy, while taking into account additional LL 87 criteria. The 2010 benchmarking results and LL 87 compliance schedule were also analyzed to determine whether DCAS-DEM had appropriately prioritized the buildings on the LL 87 schedule.

The 2013 benchmark results contained data for 2010 through 2013. This data was analyzed to develop statistics regarding the number of buildings reporting increased and decreased energy usage and greenhouse gas emissions year to year. It was also analyzed for anomalies, such as repetitive reporting for related buildings which are arranged in "campus" formations, in which a facility such as a water treatment plant may contain multiple buildings on its site that share a meter. Because DCAS-DEM stated that it investigates benchmarking data for buildings with substantial fluctuations in numbers reported from year to year, we identified a sample of extreme fluctuations that were sent to DCAS-DEM for explanation and requested documentation of its review.

To determine whether accurate information is being presented to the public, we examined data shown in the 2014 Mayor's Management Report. DCAS Goals 5a and 5b indicators were the focus of this testing. Data was compared to that presented in the 2013 MMR. Data was also compared to the list of completed capital projects and the list of completed EERs that had been provided by DCAS-DEM.

After the exit conference, DCAS-DEM provided us with additional documentation. This documentation was reviewed and the audit report was revised as required.

APPENDIX I

List of 16 Buildings with Increases in Energy Use Intensity and Green House Gas Emissions Greater than 80 Percent

	Building	Agency	Source EUI (kBtu/sq.ft.)		GHG Emissions Intensity (kgCO2e/ft²)		% Increase from 2012 - 2013	
			2012	2013	2012	2013	EUI	GHG
1	Brooklyn South 13 District Garage	DSNY	81.8	312.1	2.1	18.8	282%	795%
2	Skyports	EDC	10.1	27.6	0.3	0.7	173%	133%
3	Queens Borough Hall	DCAS	194.6	477.8	6.0	20.5	146%	242%
4	Manhattan 3 District Garage	DSNY	196.7	455.4	7.1	17.8	132%	151%
5	Brooklyn North 16 District Garage	DSNY	205.3	449.7	8.8	26.4	119%	200%
6	Pelham Fritz Recreation Center	DPR	156.0	329.2	4.8	18.1	111%	277%
7	Bronx 5 District Garage	DSNY	123.7	254.6	6.7	15.8	106%	136%
8	Section Station 92, Bronx Enforcement	DSNY	67.1	136.4	2.7	7.6	103%	181%
9	Sorrentino Recreation Center	DPR	68.4	137.9	2.4	7.2	102%	200%
10	Bronx 9, 10, 11 District Garages Campus: 11 Garage	DSNY	120.3	232.8	4.8	12.5	94%	160%
11	Bronx 9, 10, 11 District Garages Campus: 9/10 Garage	DSNY	120.3	232.8	4.8	12.5	94%	160%
12	Brooklyn South 7 & 10 District Garage	DSNY	411.1	774.3	16.1	43.5	88%	170%
13	Chelsea Health Center	DOHMH	208.8	386.8	8.2	16.1	85%	96%
14	McCarren Park Pool Complex Building	DPR	444.3	814.1	13.5	27.3	83%	102%
15	Manhattan Bowery Shelter	DHS	236.9	429.9	8.8	23.0	81%	161%
16	Hansborough Pool & Recreation Center	DPR	109.5	198.2	3.5	10.5	81%	200%

Citywide Administrative Services

Stacey Cumberbatch
Commissioner

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June 25, 2015

BY MAIL AND E-MAIL
Ms. Marjorie Landa
Deputy Comptroller for Audits
Office of the New York City Comptroller
1 Centre Street, Room 1100
New York, NY 10007

RE: The New York City Comptroller's Draft Audit Report on the Department of Citywide Administrative Services' Energy Conservation Efforts (7E14-120A)

Dear Ms. Landa:

Thank you for the opportunity to comment on the aforementioned Draft Audit Report ("Report") on your performance audit of the Department of Citywide Administrative Services' Energy Conservation Efforts. DCAS made good faith and exhaustive efforts to bring clarity to the auditors about a very technical and specialized subject matter.

However, we found that the findings and conclusions in the Report are based on unsubstantiated claims and lack of understanding of DCAS' role in the City's overall energy efficiency efforts. Consequently, DCAS cannot agree with the findings in this Report.

Nonetheless, DCAS will continue to monitor and seek to improve its processes. We will also continue to seek out innovative ideas and look to industry standards to increase efficiencies in this program.

Attached please find our response, which includes an executive summary and detailed comments on the findings and recommendations in the Report.

Sincerely,

Stacey Cumberbatch

Attachment
C: Sally J. Renfro, Chief of Staff
Ozgem Ornektekin, Deputy Commissioner
Karen S. Cohen, Director

DCAS AUDIT RESPONSE - ENERGY MANAGEMENT AND CONSERVATION EFFORTS

EXECUTIVE SUMMARY

The City of New York (City) is among the leaders in setting goals and achieving reductions in greenhouse gas (GHG) emissions in municipal government operations. In May 2015, the American Council for an Energy-Efficient Economy (ACEEE) ranked the City second in the nation in *The 2015 City Energy Efficiency Scorecard*, citing its "wide-ranging efficiency policies and programs and a history of implementing efficiency initiatives."[1]

The City's Department of Citywide Administrative Services (DCAS) Energy Management (DEM) and other City agencies are committed to the *PlaNYC* goal of 30% GHG emissions reduction by 2017 and the de Blasio Administration's *One City: Built to Last* goal of a 35% reduction by 2025 (and 80% by 2050), over a FY 2006 baseline.[2] To pursue these goals, DEM manages programs and projects in conjunction with City agencies that have contributed to the 16% reduction in City government emissions through FY 2013 reported in the latest *Inventory of New York City Greenhouse Gas Emissions*, published annually by the Mayor's Office of Sustainability (formerly the Mayor's Office of Long-Term Planning and Sustainability).[3]

The City's compliance with relevant local laws, measurement of actual GHG emissions, and use of estimates for projected emissions reduction potential from energy projects are consistent with standard industry practices and protocols, including the Local Government Operations Protocol (LGOP) for the quantification and reporting of greenhouse gas emissions inventories, the International Performance Measurement and Verification Protocols (IPMVP), and those developed by the US Environmental Protection Agency (US EPA) and the American Society of Heating, Refrigerating and Air-conditioning Engineers Inc. (ASHRAE).

In responding to the City Comptroller's June 11, 2015 Draft Audit Report of DCAS' Energy Conservation Efforts, Report No. 7E14-120A (Audit Report), DEM made good faith efforts to bring clarity to the auditors about a very complex and specialized area of the energy management and energy efficiency sector to help them better understand the City's GHG emissions measurement and reporting methodology. However, the auditors' findings exhibit a limited knowledge of DEM's role within the larger context of the City's overall greenhouse gas (GHG) emissions reduction strategies as laid out in *PlaNYC* and *One City: Built to Last*, and in compliance with Local Laws (LL) 84 and 87 of 2009.[4] The auditors failed to note that DEM is not solely responsible for compliance with LL 84 and LL 87 for City-owned buildings, but rather plays a key role in coordinating efforts under these laws with other City agencies. The failure to recognize the effort of other agencies in coordination with DEM calls into question the auditors' claims of "deficiencies" in complying with these laws.[5]

DEM's programs and energy management practices will continue to evolve over time as there is further innovation and progress in the reduction of greenhouse gas in municipal government operations. However,

[1] http://aceee.org/local-policy/city-scorecard
[2] http://www.nyc.gov/html/builttolast/assets/downloads/pdf/OneCity.pdf
[3] http://www.nyc.gov/html/planyc/downloads/pdf/NYC_GHG_Inventory_2014.pdf
[4] See Generally Acceptable Government Auditing Standards ("GAGAS" aka the "Yellow Book"), General Standards, Section 3.69, "The staff assigned to perform the audit must collectively possess adequate professional competence needed to address the audit objectives and perform the work in accordance with GAGAS." And, Section 3.72, which states in part, "The staff assigned to conduct an audit in accordance with GAGAS should collectively possess the technical knowledge, skills, and experience necessary to be competent for the type of work being performed before beginning work on that audit...b) general knowledge of the environment in which the audited entity operates and the subject matter..."
[5] See GAGAS, Field Work Standards for Performance Audits, Section 6.56, "Auditors must obtain sufficient, appropriate evidence to provide a reasonable basis for their findings and conclusions." And, Section 6.57, which states in pertinent part, "... Appropriateness is the measure of the quality of evidence that encompasses its relevance, validity, and reliability in providing support for findings and conclusions related to the audit objectives...Sufficiency is a measure of the quantity of evidence used to support the findings and conclusions related to the audit objectives..."

given the framework of the Administration's goal, and the demonstrated achievements toward that goal, we find the Audit's conclusions problematic, and cannot agree with the findings in this Audit Report.

FINDINGS AND CONCLUSIONS

Auditors' Finding No. 1: No In-house Goals to Reduce Greenhouse Gas Emissions Have Been Established

DCAS' Response to Finding No. 1

It is standard industry practice for municipalities tracking GHG emissions to establish goals and track progress at the municipal level, not at the "in-house" agency level.[6] The goals are a citywide reduction of Green House Gas (GHG) emissions from City government operations of 30% by 2017, as established under *PlaNYC* and a 35% reduction by 2025, as established under *One City: Built to Last*. Furthermore, DEM is not required by law to establish in-house goals.

DEM tracks progress toward the City's GHG reduction goals in two ways: (1) using data published annually by the Mayor's Office of Sustainability in the annual *Inventory of New York City Greenhouse Gas Emissions;* and (2) at the individual building project level, using estimates from energy audit reports prepared according to ASHRAE Level II standards (and design documents as projects proceed).

The auditors ignored data in the *Inventory of New York City Greenhouse Gas Emissions* that explains the impact of weather on the 3% decline in GHG emissions reductions reported for FY 2013, including data demonstrating a 25% year-over-year increase in Heating Degree Days,[7] an indicator of increased energy use for heating as compared to the previous year due to cold weather.

In addition, GHG reductions do not always accrue at a constant rate; therefore, the auditors' calculation of a 2.3% average annual reduction is inaccurate. The City's GHG reduction goal was legislated in FY 2008[8]; however, DEM didn't begin to realize GHG reductions until energy management programs were developed and projects were implemented. For example, the City is now realizing GHG emissions reductions from multi-year projects launched in the early years of *PlaNYC* that weren't completed until FY 2013 or later. The City remains committed, and continues to invest in projects to achieve its GHG emissions reduction goals.

Auditors' Finding No. 2: Problems with Data in Mayor's Management Report

DCAS' Response to Finding No. 2

DEM's use of consultant estimates for greenhouse gas emissions reductions is standard industry practice. The estimates are used to identify the projected impact of the efficiency measures independent of the impact of other variables (e.g., changes in weather, building occupancy, or building use). The estimates are not intended to reconcile with the aggregate data published in the *Inventory of New York City Greenhouse Gas Emissions* which is based on actual energy usage and is derived from actual energy bills and other pertinent data.

[6] City government emissions in the *Inventory of New York City Greenhouse Gas Emissions* are calculated and reported per the Local Government Operations Protocol (LGOP): California Air Resources Board (CARB), The California Climate Action Registry (CCAR), ICLEI – Local Governments for Sustainability (ICLEI), and The Climate Registry (TCR), Local Government Operations Protocol, Version 1.1 (May 2010), available online at http://www.theclimateregistry.org/downloads/2010/05/2010-05-06-LGO-1.1.pdf.

[7] Weather fluctuations are measured in degree days, in which one day at 66° would be one cooling degree day, and one day at 75° would be ten cooling degree days. (Conversely, one day at 55° would be ten heating degree days.) Degree Days are the difference between the median daily temperature and the reference temperature of 65°F, and are an indicator of the weather's impact on changes in energy use. HDD is Heating Degree Days; CDD is Cooling Degree Days.

[8] Local Law 22 of 2008, §24-803.

DEM applied an updated and more precise methodology for the FY 2014 Mayor's Management Report (MMR) data to more effectively capture project completion dates, cost savings, and energy efficiency data, because the methodology used in preparing the MMR data published under a previous administration was unclear. DEM then applied the revised methodology to the prior Fiscal Years and restated the data in the FY 2014 MMR for consistency. This allows for more accurate comparability across multiple years. At the time of resubmission, DEM clearly stated that the numbers had been revised. Given this, Table 1 in the Audit Report should be disregarded, as the comparison to FY 2013 is invalid.

In the example the auditors present in Table 2, what is described as "extreme" differences is actually miniscule when the data is aggregated across the five Fiscal Years 2010 through 2014. When comparing the aggregate projects listed in the MMR to the list of projects previously provided to auditors by DEM, the aggregate change is approximately 1%, and the aggregate change in the EER data is approximately 2%. This is due to the proper identification of project completion and allocation across the fiscal years.

Auditors' Finding No. 3: Deficiencies in Complying With Local Law 84

3a. Incomplete Benchmarking Results

DCAS' Response to Finding No. 3a

DEM has successfully complied with the requirements of LL 84. The benchmarking results include a full list of applicable City buildings drawn from a number of sources including Department of Finance (DOF) records and information provided directly by other City agencies. As allowed by LL 84, DEM updated its methodology from benchmarking groups of buildings on a tax lot (Borough/Block/Lot, a.k.a. BBL) in 2010 to individual buildings (Building Identification Number, a.k.a. BIN) starting in 2011 and going forward.

What looks like a 39% increase in the number of buildings is simply the result of DEM's efforts to get more granular data by dissecting tax lots and campus settings into individual buildings where possible. In addition, DEM took the initiative to include some smaller buildings that are not *required* to be benchmarked under the law, as the inclusion of these buildings can prove to be useful tool.

3b. Misrepresented Energy Data

DCAS' Response to Finding No. 3b

The auditors' statement that DEM misrepresented data is disingenuous, and is not supported by the evidence. The fact that the auditors disagreed with our methodology does not constitute misrepresentation. Rather, it is a conclusion based on mere opinion.[9]

LL 84 allows benchmarking by campus, i.e., where meters are shared by multiple buildings. DEM has appropriately represented energy data for campuses, which cannot be as easily and clearly presented as individual buildings. The calculations of benchmarking scores are performed by the US EPA ENERGY STAR Portfolio Manager tool, used by governments nationwide. These data are based on actual energy billing information; therefore the scores do not distort the overall result.

[9] See GAGAS, Conclusions, Section 7.27 states, in pertinent part, "...Report conclusions are logical inferences about the program based on the auditors' findings, not merely a summary of the findings. The strength of auditors' conclusions depends on the sufficiency and appropriateness of the evidence supporting the findings and the soundness of the logic used to formulate the conclusions..."

As more sub-meters are installed and more granular data become available, DEM will further refine the methodology for benchmarking campuses. The benchmarking results are published annually, with the prior year's results, as well as each preceding year back to 2010. DEM also notes in its annual benchmarking report on the DOF web site that the information in the report is subject to change due to ongoing data quality improvements, energy efficiency and conservation efforts, and changes in building use over time.

3c. Department of Education Data Not Verified

DCAS' Response to Finding No. 3c

A secondary DEM review of the Department of Education's (DOE) benchmarking data is not required for compliance with LL 84,[10] nor would it be a prudent use of City resources to duplicate DOE's efforts. In fact, DOE has a benchmarking analyst as part of its energy team to perform this function. DOE uploads its benchmarking data directly into the US EPA's web-based Portfolio Manager tool as part of the City's submission. Notably, the auditors did not identify any problems with the DOE data.

3d. No Evidence That Extreme Fluctuations in Energy Use and GHG Emissions Were Investigated

DCAS' Response to Finding No. 3d

The investigation of fluctuations in energy use is an ongoing effort in which DEM plays a role in coordination with each agency's designated Energy Liaison Officer (ELO). Agency ELOs serve as a point of contact for all utility billing issues, and have prime responsibility for reviewing monthly energy reports, monitoring billing, and reporting changes or errors in the Agency's utility accounts to DEM.

Methodology/Data Improvements:

The changes in data for the 16 buildings identified in Appendix I of the Audit Report actually reflect data improvements, ***not*** GHG emissions increases in excess of 80% as the auditors have asserted. Reasons for fluctuations for the buildings in question include:

- The 2013 benchmarking data reflected an improved methodology for capturing fuel oil data.
- Building occupancy or use changed:
    - McCarren Park Pool Complex (building #14 on the Appendix I), was just a concert venue in 2011, and then added a swimming pool, and an ice rink in 2012 and 2013.
    - Recreation centers and garages have fluctuating energy use profiles due to the nature of the building/facility use (e.g., garage doors frequently opening and closing, energy-intensive equipment such as swimming pools).

The 2013 data is a better representative baseline compared to 2012, and subsequent years will provide an even better basis for comparison.

[10] LL 84 (§28-309.3) states that "any city building shall be benchmarked by the agency or entity primarily responsible for the management of such building, in coordination with the department of citywide administrative services with respect to energy use, and with the department of environmental protection with respect to water use."

Investigation of Energy Use Fluctuations:

The auditors' suggestion that DEM investigate fluctuations in energy use based on benchmarking results is not in keeping with best practices. Benchmarking is a lagging indicator based on year-old data. Instead, the City tracks energy use and investigates fluctuations on the front end, through monthly utility bills and energy reports.

Every agency has an Energy Liaison Officer (ELO) who is responsible for monitoring monthly energy use reports, in accordance with the guidelines laid out in the *Energy Management Guide for ELOs*, which was provided to the auditors. Tracking fluctuations in energy use on a decentralized basis through the energy bills is the most effective and direct way to identify and resolve issues closer to real-time. ELOs have prime responsibility for managing their agency's energy billing, reviewing monthly energy reports, and reporting errors in utility accounts to DEM, serving as points-of contact on energy-related issues within the Agencies.

Auditors' Finding No. 4: Deficiencies in Complying With Local Law 87
4a. Incomplete Compliance Schedule

DCAS' Response to Finding No. 4a
Prior to this audit, DEM was already in the process of developing a revised compliance schedule, which was submitted to the Department of Buildings (DOB) on June 4, 2015.

DEM disagrees with the auditors assertion that 798 "buildings listed in the 2010 benchmarking results should have been included in the compliance schedule" were omitted.

- Of the 798 buildings in question, the majority were included in a compliance schedule submitted directly to the DOB by the School Construction Authority (SCA), for which SCA planned to submit the EERs.
- Most of the others were exempted from compliance with LL 87, and/or unique building/structure types not conducive to EERs (e.g., public bathrooms in Central Park).

4b. No Formal Method for Selecting Buildings for Energy Audits

DCAS' Response to Finding No. 4b
DEM provided the auditors with written details and flowcharts of the EER and LL 87 project prioritization processes, and explained its process for selecting buildings for EERs and LL 87 projects in a meeting; however, the auditors continue to confuse EERs and energy projects. DEM follows its prioritization processes that take into account a number of technical and logistical factors including, but not limited to:

- Budget availability
- Building energy performance including utilization of benchmarking scores
- Relative cost-effectiveness and feasibility of potential projects
- Age of building equipment and systems
- Aggregate energy use/GHG emissions reduction potential
- Agencies' priorities and recommendations based on their experience as the managers of City buildings

Most of the buildings in Table 3 of the audit report were not overlooked, but were school buildings (part of the portfolio of buildings that were to be addressed by the SCA on behalf of the City).

As DEM explained to auditors, which City agency manages a building is irrelevant to the technical and other criteria used to prioritize EERs or projects.

DCAS AUDIT RESPONSE - ENERGY MANAGEMENT AND CONSERVATION EFFORTS

RECOMMENDATIONS

(Recommendations #1 and #2 are addressed jointly)

1. **RECOMMENDATION: DCAS-DEM should establish in-house GHG emissions reduction goals (annual, long term, etc.) in consultation with the Mayor's Office of Sustainability to determine the extent to which its actions contribute to the overall City goal of reducing GHG emissions by 30 percent between 2006 and 2017.**
2. **RECOMMENDATION: Establish and document a process for determining the in-house GHG emissions reductions its efforts have thus far resulted in, and continue to monitor and track its progress toward achieving its goals in accordance with this process.**
   a. DEM disagrees with the auditors' recommendation that it establish separate "in-house" GHG emissions reduction goals. It is industry practice for municipalities tracking GHG emissions to establish goals and track progress at the municipal level, not at the "in-house" agency level. DEM uses the City's GHG reduction goals mandated by the Mayor and the City Council as its goals: 30% GHG emissions reduction by 2017; 35% by 2025 (interim step toward 80% by 2050). DCAS pays the heat, light, and power bills for City agencies, and plays a key role in supporting City agencies and funding energy projects initiated by City agencies; a separate DCAS-specific goal is not necessary.
   b. DEM tracks progress toward the City's GHG reduction goals in two ways: (1) overall progress is tracked using data published annually by the Mayor's Office of Sustainability in the *Inventory of New York City Greenhouse Gas Emissions*, and (2) at the project level, using estimates from energy audit reports prepared according to ASHRAE Level II standards (and design documents as projects proceed). DEM also compares energy usage reductions in buildings where it has funded energy projects as compared to changes in the City government average energy usage, as demonstrated in the inaugural Annual Local Law 87 Report submitted to the Mayor and the City Council Speaker in compliance with LL 87.
3. **RECOMMENDATION: Establish formal written policies and procedures, including detailed definitions that explain how the indicators presented in the Mayor's Management Report are computed. These policies and procedures should also establish a timeframe for the retention of documentation associated with these computations.**
   a. In accordance with the objectives of the current DCAS administration DEM is evaluating its contributions to the Mayor's Management Report and has discussed proposed changes with the Mayor's Office of Operations intended to better reflect its programs. The documentation procedures associated with MMR reporting is part of this process.
4. **RECOMMENDATION: Comply with Local Law 84 by ensuring it includes all the required buildings in its benchmarking. To determine which buildings must be included, DCAS-DEM should establish procedures to insure that it has and maintains an accurate inventory of such buildings.**
   a. DEM already complies with Local Law 84 annually. It is DEM's existing practice to include all required buildings in benchmarking, and further, to include some additional buildings that are not required to be included under the law, as an additional tool.
   b. DEM already has procedures in place for determining which buildings must be included, (e.g., Department of Finance (DOF) records, supplemented by input from City agencies).
5. **RECOMMENDATION: Establish written procedures and a methodology for benchmarking buildings associated with campuses (e.g., multiple buildings with shared energy meters) and ensure that data is accurately measured and recorded.**

a. DEM accurately measures and records the required data for campuses. DEM has procedures for benchmarking campuses, and will further refine and document the methodology as additional sub-meters are installed and more granular data become available.

6. **RECOMMENDATION: Establish written procedures to address extreme fluctuations in City buildings' energy consumption, including assigning specific numeric parameters (i.e., tolerances) to define an extreme fluctuation in energy usage or GHG emissions. In addition, maintain sufficient documentation to show the results of investigations into fluctuations.**
   a. Fluctuations in City buildings' energy use are addressed with Energy Liaison Officers (ELO) during the monthly review of agencies' energy bills. The auditors' suggestion that DEM investigate fluctuations in energy use based on benchmarking results is not in keeping with best practices. Benchmarking is a lagging indicator based on year-old data. Instead, the City tracks energy use and investigates fluctuations on the front end, through monthly utility bills and energy reports.
   b. Written procedures to address fluctuations in City buildings' energy consumption, including numeric parameters, already exist in the *Energy Management Guide for Energy Liaison Officers (ELOs).*
   c. Fluctuations in benchmarking results reflect a snapshot of a building's energy use and GHG emissions performance relative to other buildings for a specific period of time, on a lagging basis; benchmarking results should be expected to reflect fluctuations.
7. **RECOMMENDATION: Verify the accuracy of the benchmarking the data that DOE reports.**
   a. DEM disagrees with the recommendation that it duplicate the efforts of the DOE energy staff. It would not be a prudent use of City resources to have a DEM employee replicate the work already performed by energy professionals at DOE in compliance with LL 84 of 2009. DOE employs a team of energy personnel funded by DEM, including a Benchmarking Analyst, and has extensive experience in benchmarking.
8. **RECOMMENDATION: Revise its compliance schedule so that it is complete and submit it to DOB.**
   a. DEM had an updated LL 87 compliance schedule in-progress prior to receipt of the Audit Report; the revised schedule was submitted to the DOB on June 4, 2015.
9. **RECOMMENDATION: Submit revised compliance schedules to DOB on an annual basis to reflect changed conditions such as building additions, deletions or sub-meterings.**
   a. DEM disagrees. Annual submission of revised compliance schedules for EERs to the DOB is neither required under Local Law 87, nor necessary, as there are not changes significant enough to merit a new schedule on an annual basis. DCAS will continue to submit revised compliances schedules to DOB as warranted, in compliance with the law.
10. **RECOMMENDATION: Develop formal policies and procedures for prioritizing buildings for LL 87 compliance.**
    a. DEM already has and follows guidelines and processes for prioritizing buildings for LL 87 compliance which is documented in flowcharts that were shared and discussed with the auditors. DEM examines several factors in the selection and prioritization of energy retrofit projects for LL 87 compliance including relative cost-effectiveness and feasibility of potential projects in addition to cost per metric ton of GHG emissions reduced and overall GHG emissions reduction potential. We would note that "policies" for prioritizing buildings for energy efficiency reports are not defined in the law.