

Case Study:

New York City's *Greener, Greater Buildings Plan*

How the City created and implemented the nation's most comprehensive plan to reduce energy use and greenhouse gas emissions in existing buildings



Photo Credit: New York City Department of Parks and Recreation, Brooklyn Bridge Park. 5.13.10.

A Product of the Commercial Energy Policy Toolkit

November 2011



Case Study Overview

This case study provides local government staff and leaders with an inside look at New York City's *Greener, Greater Buildings Plan*, an innovative and scalable package of energy efficiency policies and programs for commercial and multi-family buildings. This case study highlights the plan's comprehensive approach while distilling lessons learned for other local governments to apply to their planning efforts. The case study is part of the ICLEI & IMT's Commercial Energy Policy Toolkit.

Read the case study to learn more about:

- The four Local Laws that make up the core of the plan—how they work and how they complement one another to create a comprehensive approach to addressing energy efficiency in existing buildings
- How the plan was developed, including extensive stakeholder outreach
- The challenges of implementing the local laws, including access to data and compliance
- Next steps for New York City, including analyzing data, adding additional building codes, financing new energy efficiency projects, and addressing noncompliance
- Ways to replicate New York City's success, and key success factors for other cities, including specific goal-setting, appropriate stakeholder engagement and the tools and training necessary to support building owners and managers.

About the Commercial Energy Policy Toolkit

ICLEI-Local Governments for Sustainability USA (ICLEI) and the Institute for Market Transformation (IMT) developed the Commercial Energy Policy Toolkit to assist local governments in achieving energy efficiency and conservation in the commercial sector.

The toolkit builds upon New York City's *Greener, Greater Buildings Plan*, and is designed to help local governments that seek to engage the private sector in achieving greater energy efficiency gains in existing commercial buildings, which typically account for a significant share of energy consumption, consumer energy costs and greenhouse gas emissions. The goal of this effort is to advance innovative program and policy tools in local jurisdictions that have the greatest potential to reduce energy consumption in commercial buildings.

This case study, along with the 11 program and policy fact sheets and four recorded webinar presentations, comprises the Commercial Energy Policy Toolkit. The fact sheets outline actionable program and policy guidance in the following areas:

- Audits and Retro-Commissioning
- Cool Roofs
- Energy Code Compliance
- Energy Efficiency Appraisal
- Energy Rating and Disclosure
- Green Business Recognition Programs
- Green Financing
- Green Leasing
- Lighting Upgrades
- Sub-Metering
- Workforce Development

About ICLEI

ICLEI-Local Governments for Sustainability USA is the nation's leading nonprofit membership association of local governments committed to sustainability, climate protection, and clean energy. The local governments we serve—including 550 active U.S. members—recognize the importance of creating livable, prosperous communities, addressing climate change, and saving energy and money in the process. ICLEI USA provides the expertise, technical support, training, and tools to help its members advance their goals. To learn more, visit www.icleiusa.org.



About IMT

The Institute for Market Transformation (IMT) is a Washington, DC-based nonprofit organization promoting energy efficiency, green building and environmental protection in the United States and abroad. IMT's work addresses market failures that inhibit investment in energy efficiency and sustainability in the building sector.



The collaborators for this case study include Kim Brokhof, Brian Holland, and Ryan Foshee from ICLEI. ICLEI would also like to acknowledge and thank the individuals who interviewed and reviewed this case study: Laurie Kerr, Hilary Beber, Adam Hinge, Charlotte Matthews, Russell Unger, Saverio Grosso, and Scott Frank.

Table of Contents

I. Overview of the Greener, Greater Buildings Plan.....	5
II. Greener, Greater Buildings Plan Development.....	8
A. Overview of the Planning Process	
B. The “Comprehensive Approach” to Greening Existing Buildings	
C. The Role of Stakeholders	
III. Implementation of the Plan	14
A. Status To Date	
B. Challenges	
C. Next Steps	
IV. Replicating New York City’s Success	19
A. Is New York City Unique?	
B. Success Factors	
C. Key Takeaways	
i. Biographies.....	25
ii. References.....	26

I. Overview of the *Greener, Greater Buildings Plan*

The *Greener, Greater Buildings Plan* (GGBP) was developed in concert with New York City's sustainability plan, PlaNYC. Spearheaded by Mayor Michael Bloomberg in 2007, PlaNYC is one of the most robust and comprehensive sustainability plans in the nation, outlining the City's proactive approach to preparing for an increasing population, aging infrastructure, and an environment at risk while continually working to enhance quality of life for residents. PlaNYC was originally developed through stakeholder input from City agencies, the Mayor's Office, City Council, New York State agencies, non-profits, the private sector, and the residents of New York City. Since the initial release of PlaNYC, a multitude of the initiatives contained within it have been implemented, and the first four year update was released in April 2011.



Photo Credit: New York City Mayor's Office, PlaNYC Speech, December, 2007

When PlaNYC was developed, it included an initiative to reduce energy consumption across five key areas of building consumption. This concept was eventually transformed into the *Greener, Greater Buildings Plan*. The *Greener, Greater Buildings Plan* legislative package enacted in December 2009, consisted of four Local Laws:

- NYC Energy Conservation Code (Local Law 85)
- Energy and Water Benchmarking (Local Law 84)
- Energy Audits and Retro-commissioning (Local Law 87)
- Lighting Upgrades and Sub-metering (Local Law 88)

NYC Energy Conservation Code (Local Law 85)

The NYC Energy Conservation Code (NYCECC) was adopted in December 2009 and went into effect on July 1, 2010. The NYCECC builds upon the New York State Energy Code, strengthening the State Code in one key area. NYCECC provisions apply to all renovations and repairs as if they were new construction; previously, the State Energy Code requirements applied only to renovation projects involving more than 50 percent of a building system or subsystem. This approach is intended to ensure that the city's building stock accrues the benefits of energy efficiency during the natural cycles of building upgrades. With a limited number of exceptions—such as buildings with historic or landmark designation—all projects that are subject to construction approval from the Department of Buildings are now required to demonstrate compliance with the NYC Energy Conservation Code in their construction submittals, including a Statement of Compliance; energy analysis; construction details; and progress inspections.

Energy and Water Benchmarking (Local Law 84)

Local Law 84 requires owners of large buildings to benchmark their energy and water consumption. Benchmarking is the practice of comparing a building's performance to itself over time or to other similar buildings, allowing owners and operators to establish an performance baselines, track performance, identify investments in energy efficiency, and verify energy savings. In the case of Local Law 84, owners of covered buildings (see Table 1) are required to annually benchmark building information and energy and water consumption, using EPA's Energy Star Portfolio Manager software tool, and submit results to the City. The Department of Finance is tasked with compiling and releasing the data to the public, beginning September 1, 2011 for city-owned or operated buildings; September 1, 2012 for non-residential private buildings; and September 1, 2013 for residential private buildings.

Table 1. Building Size Thresholds for Application of Local Laws 84, 87, and 88

City-owned or operated building	One building	Two or more buildings on the same tax lot	Two or more buildings under same condominium ownership
More than 10,000 square feet	More than 50,000 square feet	More than 100,000 square feet	More than 100,000 square feet

Energy Audits and Retro-Commissioning (Local Law 87)

Local Law 87 requires energy audits and retro-commissioning for large buildings, as shown in Table 1. Energy audits and retro-commissioning activities help operators and building owners identify and improve a building's energy performance. An energy audit is a comprehensive assessment of a building's energy consumption, including base building systems, insulation, operational characteristics and other elements. In retro-commissioning, building systems are assessed and fine-tuned for more optimal performance.

Under Local Law 87, energy audits and retro-commissioning must be carried out for all base building systems, including HVAC; electrical and lighting; domestic hot water; building envelope; and conveying systems. Requirements begin in 2013 and will be phased in across the existing building stock over 10 years. Buildings must undergo auditing and retro-commissioning every 10 years from their first scheduled audit. While most buildings are covered, the law does allow for a number of exemptions for buildings that have recently demonstrated energy efficiency performance.

Lighting Upgrades and Sub-metering (Local Law 88)

Local Law 88 requires energy-efficient lighting system upgrades and electricity sub-metering in covered buildings (see Table 1) by January 1, 2025. Lighting must be upgraded to the lighting standards of the NYCECC in effect at the time of the upgrade. Sub-meters are required for floors or tenant spaces larger than 10,000 square feet, and monthly electricity statements are to be provided to sub-metered tenants. Exemptions are provided for residential units and tenant spaces smaller than 10,000 square feet.

Green Workforce Development Training

Building on the four legislative pieces, workforce development and financing provide the supplemental pieces to the *Greener, Greater Buildings Plan*. In addition to the expected \$700 million annual reductions in citywide energy costs through 2030, the City also expects the GGBP to create roughly 17,800 construction-related jobs.¹ The local workforce will need the right level of training to perform energy audits, lighting upgrades, retro-commissioning and other energy efficiency needs. New York City assembled a working group, including key stakeholders from universities, unions, the engineering field, and those in the professional and real estate sectors, to understand and respond to those needs. The group will identify the workforce needs and opportunities created by the Local Laws, identify training needs, and bring them to building community to ensure the supply of necessary skills, and advise on certification requirements for energy auditors and retro-commissioners.²

¹ The City of New York Website. *Greener, Greater Buildings Plan*.

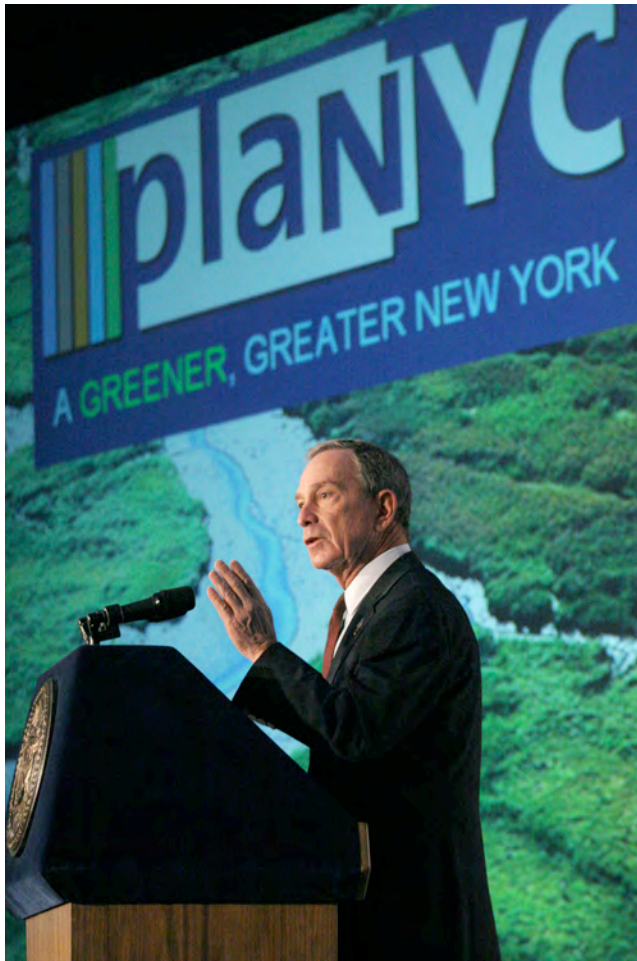
² The Sallan Foundation Website. *Greener, Greater Buildings Plan*.

Green Building Financing

New York City recently formed the New York City Energy Efficiency Corporation (NYCEEC), a new nonprofit corporation, created as a partnership between the City and energy efficiency leaders from the private and nonprofit sectors. To encourage energy efficiency retrofits in existing buildings, the NYCEEC will leverage \$37.5 million in US DOE Energy Efficiency and Conservation Block Grant funds against foundation dollars and private investments. Currently, NYCEEC is developing new financial products and services to assist building owners and tenants, incentivize new lending practices that support efficiency, and streamline access to information about energy efficiency opportunities and incentives.³

II. *Greener, Greater Buildings Plan* Development

Photo Credit: New York City's Mayor's Office, April 22 Speech PlanNYC Speech, 2007



A. Overview of the Planning Process

To enable the creation of PlanNYC and the associated *Greener, Greater Buildings Plan*, Mayor Bloomberg created New York City's Office of Long Term Planning & Sustainability (OLTPS) in 2006. Shortly after its creation, the Office created the Sustainability Advisory Board (SAB) made of seventeen external experts to provide guidance and contribute to research and analysis of local sustainability issues. The SAB was comprised of local elected officials and experts from national and local organizations that represented a variety of fields and interests, including environmental justice, green buildings, energy and environmental policy, city planning, real estate, business, and labor. The SAB helped to

develop the GGBP goals, acted as a critical sounding board for initiatives being considered, and provided a great deal of support in analyzing various strategies for achieving the goals.⁴

³ HR&A Advisors Website. Building the New York City Energy Efficiency Corporation.

⁴ PlanNYC 2007

The guidance of the PlaNYC Sustainability Advisory Board, and many other internal and external stakeholders paved the way for the City to move forward with its green building and energy efficiency initiatives. The City spent 15 months researching and developing a package of energy efficiency initiatives, and on Earth Day 2009, Mayor Bloomberg and Council Speaker Quinn introduced their *Greener, Greater Buildings Plan* to the public. The GGBP gained support through the remainder of the year, and the four laws easily passed City Council in December 2009. Ultimately, the combination of stakeholder engagement, extensive technical input, and strong leadership enabled New York City to put in place one of the most ambitious local government energy efficiency programs to date.

B. “Comprehensive Approach” to Greening Existing Buildings

In PlaNYC, the New York City established a goal of reducing greenhouse gas (GHG) emissions 30 percent by 2030. 75 percent of the city’s GHG emissions result from the energy used in buildings, and City staff recognized early on that a multi-faceted effort to address energy use in buildings would be essential in reaching the emissions reduction goals.

The goal to reduce emissions 30 percent by 2030 was also approached in a comprehensive manner. According the PlaNYC 2011 report update, efficient buildings are projected overall to reduce emissions by 12.7 million metric tons of carbon dioxide equivalents. The *Greener, Greater Buildings Plan* is expected to contribute 5 percent emission reductions towards the overall 30 percent reduction goal. The remaining reductions from existing buildings will come from the City’s energy use reduction, and universities and hospitals competing in the Mayor’s Challenge. The City is also working towards producing cleaner energy with New York State.

According to Laurie Kerr, Senior Policy Advisor with New York City’s Office of Long Term Planning and Sustainability, “The need for an array of strategies was apparent to us in the beginning because of the broad nature of the problem.”⁵ The City set out to create a plan that addressed the residential, commercial, and institutional sectors; utilized a mix of voluntary programs, incentives, and mandates; and promoted a wide range of practices—from improving the City’s own building portfolio to creating stronger codes and requiring retro-commissioning and benchmarking in both public and private sector buildings. Adam Hinge, Managing Director at Sustainable Energy Partnerships and stakeholder in the development of the *Greener, Greater Buildings Plan*, has researched policies and best practices in building efficiency policies around the world. He describes the GGBP as, “The most comprehensive package for energy efficiency improvements and carbon reductions in large buildings that has been seen in the US and around the world.”⁶

⁵ Laure Kerr. Phone Interview. October 25, 2011

⁶ Adam Hinge, Personal Interview, September 8, 2011.

Jurisdictions around the country have been addressing energy efficiency in the built environment through codes for new buildings and incentives to upgrade existing buildings. Unfortunately, these have only minimally slowed growth in energy consumption. For New York City, it was clear that these efforts would need to be joined by requirements to adopt cost effective improvements, along with other proactive strategies. New York City's comprehensive, multi-policy approach presents a strategy for achieving the deep reductions in energy consumption that are possible in its large and relatively older building stock. This goal would be impossible to achieve with just a handful of independent programs.

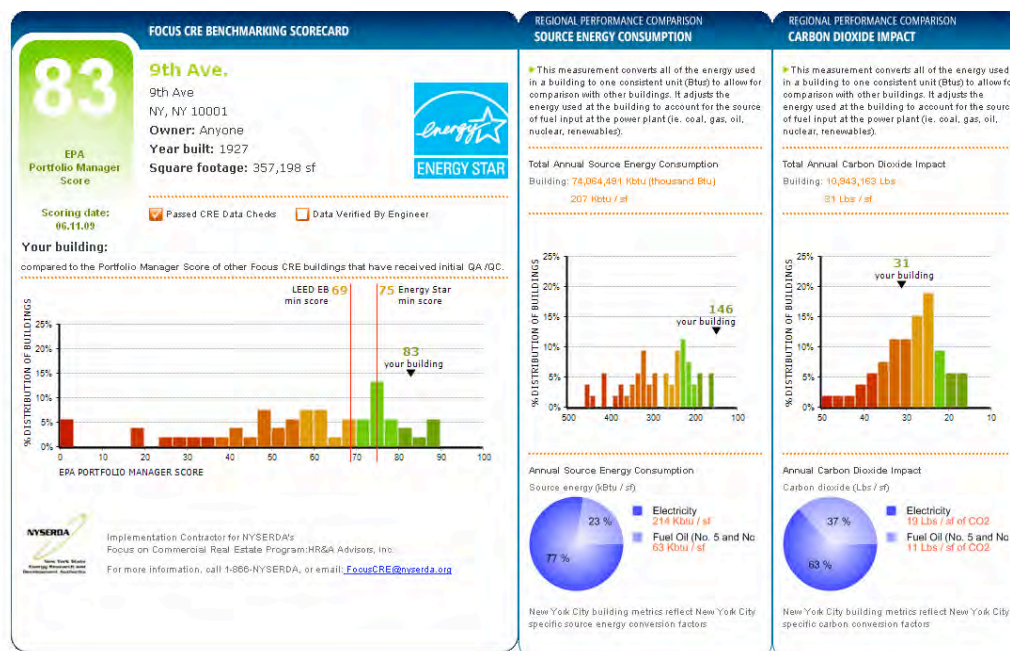
New Access to Information Brings Benefits for All

The individual parts of the *Greener, Greater Buildings Plan* are impressive policies in their own right, but when combined, they complement and build upon one another, and represent a powerful force for driving improvement in the efficiency of buildings not just in New York City, but beyond. The first law, Local Law 84, requires annual mandatory energy performance benchmarking, and public disclosure of this information from buildings. Benchmarking and disclosure will create market transparency about energy use in buildings. This data will be useful to building owners and operators, along with policy makers, engineers and the financial community. According to Scott Frank, partner at Jaros Baum & Bolles (JB&B) and stakeholder in the development of the GGBP, "The EPA [Environmental Protection Agency] and DOE [Department of Energy] have struggled with a database of statistics of energy performance called CBECS [Commercial Buildings Energy Consumption Survey], the database used in the ENERGY STAR program to benchmark buildings. The combination of the population of buildings in New York City and the mandatory reporting requirement with the commitment to share that data with basically anyone will be of terrific value, almost nationwide. It will be the single largest reliable population of statistics regarding energy performance for a wide variety of buildings."⁷

The data collected through benchmarking allows building owners and their tenants to track consumption and monitor progress. As Laurie Kerr notes, "Some of the measures within the *Greener, Greater Buildings Plan* provide information, while others require improvements to be made. Benchmarking begins by providing useful information to building owners and the general public about energy consumption."⁸ Local Law 84 will require both residential and commercial buildings to report usage in an effort to become aware of consumption. Building owners and tenants alike are given the opportunity to process and compare their building's consumption versus similar buildings in New York City. The information benchmarking provides is a powerful platform for additional change.

⁷ Scott Frank. Personal Interview. September 13, 2011

⁸ Laurie Kerr. Phone Interview. October 25, 2011.



The benchmarking and public disclosure of energy performance—and the associated marketability of a property—provide an impetus for change. For those concerned with their building’s performance via benchmarking, the mandatory energy audits and retro-commissioning in Local Law 87 will provide a road map for how building owners can start to address energy efficiency. Laurie Kerr explains, “Energy audits provide information about beneficial energy efficiency upgrades, while retro-commissioning provides immediate cost-effective actions to take.”⁹ If building owners are unaware of their consumption and the steps available for them to reduce consumption, the motivation to make change is unlikely. As suggested by Russell Unger, Executive Director of Urban Green Council, “Give owners the information about energy use and the money wasted. They’ll make changes when the information is in front of them. Rely on information to drive change.”¹⁰ The City will have the ability to track the direct impacts of energy audits and retro-commissioning activities through the energy information collected via benchmarking.

Information is also key to the sub-metering requirements in Local Law 88. While benchmarking and disclosure presents buildings owners and the public with information on buildings overall energy consumption, an awareness of any given tenant’s contribution to those figures will be further realized once sub-metering is required and tenants have the ability for the first time to see their own energy usage. Charlotte Matthews, Vice President at Sustainability for Related, describes sub-metering as, “A way to address alignment of landlords and tenants to energy efficiency upgrades.”¹¹ The City also tried to align the 2025 compliance date with lease terms. By requiring sub-

⁹ Laurie Kerr. Phone Interview. October 25, 2011.

¹⁰ Russell Unger. Personal Interview. September 22, 2011.

¹¹ Charlotte Matthews. Personal Interview. September 26, 2011.

metering by 2025, the timeframe will allow for leases to turn over at least once before the compliance date. The information available to both building owners and their tenants through the *Greener, Greater Buildings Plan* may help bridge the split-incentive that occurs when the party paying for the upgrade would not be the party accruing the savings; an issue commonly experienced in the real estate industry in terms of improving energy efficiency.

The *Greener, Greater Buildings Plan* intends for the data supplied from benchmarking, audits, and sub-metering to drive action. Local Law 88 also prescribes lighting system upgrades, addressing some of the external sources that will continually drive energy consumption and change. By requiring lighting system upgrades, owners are directed to the “low hanging fruit” in terms of return on investment and payback period. Lighting is commonly 30-40% of a commercial building’s energy use, and upgrading lighting with current technology will result in quick paybacks.

Bundling Initiatives Together

By packaging the laws of the *Greener, Greater Buildings Plan* together, New York City was able to advance multiple efforts that complemented one another. At least 10 initiatives were originally suggested, with the four adopted laws constituting the elements of the GGBP. There is an appetite for more. City staff have been approached by residents and industry stakeholders asking eagerly when new components will be passed, a response Laurie Kerr describes as, “Unexpected but appreciated!”¹²

Bundling numerous initiatives together under the GGBP has captured the attention of a broad audience including those outside of New York City. Initial indications are that the initiative is transforming the industry beyond the sum of its parts and exceeding expectations. Laurie Kerr shares that, “Suddenly major engineering companies from California and elsewhere are interested in opening branches in New York City. Venture capitalists are considering the advanced equipment that can be used in the implementation of these laws.”¹³ Some claim that regulating energy efficiency will harm the economy and stunt economic growth. Experience in New York City is beginning to suggest that regulations have spurred growth in certain sectors—a very plausible outcome with serious implications for economic development in cities across the country.

C. The Role of Stakeholders

Stakeholders played and continue to play a vital role in the creation and dissemination of information surrounding the *Greener, Greater Buildings Plan*. The broad scope of the GGBP required an equally-broad spectrum of stakeholders that includes industry experts in the engineering and architecture community, labor unions, environmentalists, tenant groups, and the broader real estate community. Various stakeholders were engaged in

¹² Laurie Kerr. Phone Interview. October 25, 2011.

¹³ Laurie Kerr. Phone Interview. October 25, 2011.

different ways and at different steps during the creation of the GGBP. According to Scott Frank, “[The Mayor and City Council] were aligned internally, so the focus was on non-governmental stakeholders. Because of the alignment on the goals they wanted to accomplish with the GGBP, they could focus on other constituents.”¹⁴ Some of the stakeholders had been involved with PlaNYC, which naturally led to their continued involvement with the *Greener, Greater Buildings Plan*.

Development Through Outreach

While some stakeholders assisted New York City in developing the components of the *Greener, Greater Buildings Plan*, others served in a variety of roles refining and disseminating the information. Outreach was another vital role that stakeholders played. As Russell Unger describes, “The outreach plan began six months prior to the *Greener, Greater Buildings Plan* release. After reaching out to major real estate associations and the private sector, in March 2009, people were more knowledgeable and aware of the big picture.”¹⁵ One-on-one meetings were held prior to Earth Day, and a broad outreach effort to the community continued afterwards. This process was successful, given that the feedback received after the Earth Day announcement of the proposed legislation in 2009 was primarily positive. For some, the Earth Day announcement was a sign that things were beginning to take shape and move forward. For others, even though the announcement symbolized that progress was happening, it was the perfect opportunity to shape how the laws were structured and voice concerns.

Shaping the Plan

The real estate industry’s greatest concern with the initial GGBP was its mandating of energy efficiency retrofits, which were included with the energy audits and retro-commissioning law. The proposed mandate stipulated that any measure identified through the energy audit as having a payback period of less than five years would be completed as part of the retrofit project. Scott Frank explains that, “The owner community was very uncomfortable with that, and for some good reasons, not the least of which is the extent of subjectivity that is involved in many aspects of energy audits: identifying what these measures and the payback and savings really are, and what the cost will really be.”¹⁶ The City eventually decided not to mandate energy retrofits because the “split-incentive” in both commercial and residential buildings would result in cases where the party paying for the upgrade would not be the party accruing the savings. This ran counter to the City’s goal of ensuring that property owners would ultimately benefit from the requirements. The City does provide financing options for those interested in pursuing retrofits, and provide sample language on the *Greener, Greater Buildings Plan* website for an energy-aligned lease to help address the split incentive.

¹⁴ Scott Frank. Personal Interview. September 13, 2011.

¹⁵ Russell Unger. Personal Interview. September 22, 2011.

¹⁶ Scott Frank. Personal Interview. September, 13, 2011

Similarly, when EPA's Portfolio Manager tool was announced as the method for collecting benchmarking data, some expressed concern over the tool's ability to equitably assess New York City's building stock. The discussions that stemmed from this concern led to the invitation for the EPA to become a partner in the process, and review how the tool collects and assesses New York City's buildings. The City became an ENERGY STAR partner, and these concerns were addressed in partnership letter dated 4-17-2009. The letter outlines EPA's intentions to expand tracking functionality for multi-family residential buildings for inclusion in their benchmarking software, coordinate a data collection to analyze the impacts of data centers' energy use in large buildings, gather data to reflect the prevalence of district steam generation at a national level if appropriate, and outlines intentions to work with the City and the City's utilities to facilitate the automatic upload of utility data when feasible.

The revised law that was ultimately passed in the GGBP included an exclusion for data centers and broadcast towers. Those buildings won't be included or required to benchmark until an appropriate methodology is agreed upon. The City's approach to soliciting and addressing these concerns has been commended by many. Saverio Grosso, Regional Vice President at ENERActive Solutions, shares, "Rather than just mandate and say, 'this is how it is,' they'll [the City] actually get the people standing as the biggest obstacles, bring them in, have a discussion, educate them on the process, and they change the plan based on feedback as well as changing the industry's mindset through their marketing – how they present the thing. So, rather than arguing about things, they took the opportunity to say 'Well, if you have something to say, come in.'"¹⁷ This proactive approach benefited the community by enabling their opinions to be heard, and benefited the City by providing valuable insight throughout the creation of the *Greener, Greater Buildings Plan*.

III. Implementation of the *Greener, Greater Buildings Plan*

A. Status to Date

Implementation of Local Laws

Since the release of PlaNYC in 2007, an impressive 97% of the 127 initiatives have been launched within one year of its release, and almost two-thirds of its 2009 milestones have been achieved or mostly achieved according to New York City's PlaNYC website.¹⁸ One of the largest accomplishments was enacting the legislation of the *Greener, Greater Buildings Plan*. Local Law 84, responsible for energy and water benchmarking, was the first of the four pieces of legislation to be put in effect. The law called for City-owned buildings to benchmark by May 2010.¹⁹ Since 2009, the Department of Citywide Administrative Services has worked with 28 agencies to benchmark almost 3,000

¹⁷ Saverio Grosso. Personal Interview. September 8, 2011.

¹⁸ *The City of New York Website. About PlaNYC.*

¹⁹ *The City of New York Website. Greener, Greater Buildings Plan.*

buildings including libraries, police stations, firehouses, schools, courthouses, health, community and family centers, and government offices. This data has been made publically available on the Department of Finance website.²⁰

Two months after the benchmarking requirement for City-owned buildings went into effect, the new requirements of the New York City energy code began. In July 2010, Local Law 85 went into effect, requiring that all buildings comply with the 2010 New York State Energy Code, calling for energy code compliance not just in new construction and major renovations, but in all renovations, additions, and repairs.



Photo Credit: New York City Mayor's Office, City Hall. 6.22.11

The most recent piece of the *Greener, Greater Buildings Plan* to go into effect was the privately owned buildings benchmarking requirement. The Department of Finance sent notices in December 2010 to all building owners that would fall under the requirements of the new law. In May 2011, buildings over 50,000 square feet were required to submit a

benchmarking report; an annual deadline. The Office of Long Term

Planning and Sustainability extended that deadline in a March 2011 announcement for three months after May 1, 2011 no penalty would be assessed due to failure to comply.

By the new August 1, 2011 deadline, “Two-thirds of the covered buildings had complied, which was a great success,” says Laurie Kerr.²¹ In order to continue to collect the remaining reports, New York City’s Department of Building’s issued an extension for buildings to comply by December 31st, 2011. “We want to be reasonable and give more time for buildings to comply in the first year, especially since this a very new practice for some buildings,” adds Laurie Kerr. “But we will also impose fines if necessary.”²² For those that miss the extension deadline, the City’s Department of Buildings may issue a violation and may do so quarterly for failing to submit the report. Each violation carries a penalty of \$500 per building, and failure to comply when reassessed quarterly could result in additional penalties.²³ In addition, the benchmarking results will be analyzed and reported for the first three years that the law is in effect to measure the effectiveness of the law and to better understand energy use in buildings.

²⁰ The City of New York Website. Benchmarking Reports.

²¹ Laurie Kerr. Phone Interview. October 25, 2011.

²² Laurie Kerr. Phone Interview. October 25, 2011

²³ The City of New York Website. Benchmarking FAQs.

Local Law 87, relating to energy audits and retro-commissioning, will go into effect in 2013, and Local Law 88 requiring lighting upgrades and sub-metering has the deadline of January 1, 2025. Beyond these community-scale regulations, the City has led by example through the implementation of initiatives towards achieving their 30 percent GHG emission reduction by 2017 in City operations. Mayor Bloomberg also issued a Challenge to universities and hospitals other institutions to match the City's goal. Many have stepped up and accepted the Challenge, furthering the widespread impact of the *Greener, Greater Building Plan* goals.

B. Challenges

Accessing Whole Building Data

"While we've faced numerous challenges in implementing such novel requirements, we have been fortunate that members of the real estate and professional communities, the non-profits and NYSERDA have consistently provided critical assistance and resources," says Laurie Kerr.²⁴ As an example, some challenges have arisen with data collection. Russell Unger agrees, noting that, "The biggest challenge is with benchmarking, getting whole building data from utilities. Get utilities to be partners and ultimately get the Public Service Commissions around the country to require support of uploading whole building data. There are still discussions about auto-uploads with ConEd [the local utility]. It is more difficult to get data than it should be, making owners do things that they shouldn't have to do because it is so inefficient, causing extra effort and frustration."²⁵ Con Edison responded to ease the burden of collecting data by providing building owners with aggregated building data for both electric and gas consumption up to 24 months, at a fee of \$102.50 per building. Building owners are still required to upload the aggregated building data into the EPA's Portfolio Manager website and submit the data to New York City.²⁶

Compliance Confusion

When the benchmarking law came to fruition, there was some initial confusion for businesses about what they were required to do in order to comply. Russell Unger points out, "It is one thing to create a policy, another to create a law and pass it, but implementation is another set of challenges. If you write a law that someone can't understand, it makes it difficult to comply. You need something to bridge from legal to practical."²⁷ Once the City received feedback about the benchmarking law, they swiftly took action to ensure compliance and comprehension among constituents. The Urban Green Council was tasked with creating a benchmarking checklist that would outline the steps required for compliance in a simple step-by-step fashion. The checklist now resides on the *Greener, Greater Buildings Plan* website, and Russell along with fellow

²⁴ Laurie Kerr. Phone Interview. October 25, 2011.

²⁵ Russell Unger. Personal Interview. September 22, 2011.

²⁶ Con Edison Website. Energy Efficiency.

²⁷ Russell Unger. Personal Interview. September 22, 2011.

partners and members of the GGBP's speaker's bureau include the checklist in presentations given to buildings and their owners.

New York City has also minimized challenges and non-compliance by taking an aggressive approach with outreach, training, and financing options for buildings. Laurie Kerr believes that once people are given the information and tools they need to be successful, they'll comply. "Since the launch of the *Greener, Greater Buildings Plan*, significant time has been spent on those efforts," says Laurie. "The City and its partners have provided half day trainings, a call center, a City website that lists resources, and created a step by step checklist for benchmarking, along with other general outreach."²⁸ When a new law goes into effect, there will be some unknown and new experiences for many, and the City hopes to assist by making the process as simple as possible. For other communities interested in following New York City's lead, Laurie stresses that it is important "not to just create new requirements, but it's necessary to supplement them with assistance, too."²⁹ The table below outlines the resources created or in creation to support the Local Laws. New York City has many resources within the community that have assisted with these efforts, but with the high compliance rate thus far, it is easy to see that this strategy is working.

Local Law	Resource	Partner
New York City Energy Conservation Code	Half-Day Training*	Urban Green Council & AIANY
	2-Day Trainings in Person & on web	NYC Department of Buildings
	Lighting Training Code*	Green Light NY
Energy & Water Benchmarking & Disclosure	Weekly 3 Hour Classes*	Association for Energy Affordability
	Online Trainings	EPA
	Step-by-Step Instruction (Checklist)	Urban Green Council and the Related Companies
	Benchmarking Help Center* (Call-in Hotline)	CUNY Graduate Students
	Step-by-Step & FAQ on Whole Building Electricity Data	Con Edison
Energy Audits & Retro-Commissioning (Resources Under Development)	Certified Energy Manager Trainings (CEM)*	Association of Energy Engineers
	11, 3 Day Trainings on Existing Building Commissioning*	Building Commissioning Association (BCA)
Lighting Upgrades & Sub-Metering (Resources Under Development)	Classes on Lighting Code,* Lighting Upgrades, and Sensors and Controls	Green Light NY
		*Funded by NYSERDA

²⁸ Laurie Kerr. Phone Interview. October 25, 2011.

²⁹ Laurie Kerr. Phone Interview. October 25, 2011.

C. Next Steps

Analyzing Collected Data

New York City will begin to review and post the benchmarking data that is being collected from privately owned buildings. The City will also continue reviewing how the data is evaluated, reported, and used. New York University and the University of Pennsylvania have partnered with the City to help with the data review. An additional benefit of collecting this vast amount of data is the ability to make better policy decisions. The data compiled from public and private buildings will supply New York City with the informational foundation it needs to shape new policies and modify the existing ones under the *Greener, Greater Buildings Plan*.

Provide Financing Options

With the recent launch of the New York City Energy Efficiency Corporation (NYCEEC), the City will begin to provide financing for energy efficiency projects and comprehensive information about funding and tax benefits. New York State Energy and Research Development Authority (NYSERDA) provides a program to assist buildings with funding for benchmarking, energy audit and retro-commissioning studies. Con Edison and National Grid also offer energy efficiency programs.

Address Non-Compliance

The City must also remain cognizant of how it will address buildings that do not comply with the Local Laws. Violations and penalties are posted on the City's website, but with the first laws only recently put in place, there is not a precedent for the enforcement arm of the *Greener, Greater Buildings Plan*. Saverio Grosso notes, "The big question that's often asked of me is, 'Well, what happens if we don't do anything?...Is the fine going to be cheaper than your service? And if so, I'll just pay the fine.' So, without a clear definition of what skin is in the game for stakeholders, what's in store for them, I think there's going to be some resistance to implementing the aspects of the GGBP that are vital. Of course there are penalties, but if you didn't fear getting a ticket for doing 80 on the freeway, you wouldn't slow down."³⁰ Enforcement will be an issue of ongoing consideration in evaluating how to continually move the plan forward.

Review and Enact Additional Green Codes

"Now that the political will and momentum exists...this is the first step of what we expect to be several more steps in really starting to address energy," said Scott Frank.³¹ Where the *Greener, Greater Building Plan* ends, the Green Codes Task Force resumes the mission of continuing to push for deeper reductions. In July 2008, Mayor Bloomberg asked Urban Green Council to convene a task force to advise the city on how to change municipal codes. The Green Codes Task Force recommended code changes focused on

³⁰ Saverio Grosso. Personal Interview. September 8, 2011.

³¹ Scott Frank. Personal Interview. September 13, 2011.

new construction, while the GGBP focuses on existing buildings. The Urban Green Council’s Green Codes Scorecard displays 37 of the 111 code changes that are in motion including: 16 enacted by NYC Council, four enacted by NYC Agency, two enacted at the Federal Level, three programs in process, and 12 pending bills. The Green Codes Task Force continues to advocate for the adoption of all 111 code modifications to enhance and complement the GGBP.³²

Continue Outreach and Educational Efforts

Following laws and regulations, another next step must be to continue providing outreach and education surrounding energy efficiency. The City will continue addressing training needs and opportunities through its Green Workforce Development Training program. In fact, the City is encouraging buildings to begin energy audits and retro-commissioning prior to the suggested 2013 start date. If buildings begin undergoing retro-commissioning early, the City will be better prepared to address the needs of the workforce and understand what skills are still needed.

Behavior change must occur simultaneously, or in step with regulations. As Scott Frank points out, “You wouldn’t walk out of your house without turning off the light switch. But everyone walks out of their office and doesn’t think twice about it. Companies vacate entire floors and leave lights on, and you walk around town and you see lights on all the time.”³³ Though requiring upgraded lighting systems for increased efficiency and sub-metering for an awareness of consumption, there is still, of course, a strong degree of decision making to be made by citizens. A city can regulate, but without a deep public understanding of the reasoning behind the laws, reaching the goals will remain challenging.

IV. Replicating New York City’s Success

A. Is New York City Unique?



Photo Credit: New York City Economic Development Corporation, View of Chrysler Building. 2.17.08

When the people interviewed for this case study were asked if New York City was unique in its ability to implement a comprehensive energy efficiency policy for existing buildings, the overwhelming response was no—this type of plan should be an option for other cities around the nation. According to Scott Frank, “I would say, this is the cliché, but at the same time if we got this done in

³² Urban Green Council Website. Green Codes.

³³ Scott Frank. Personal Interview. September 13, 2011.

New York City with all of the difficulty and challenges and baggage, that it can be done anywhere.”³⁴ Though there are cities across the United States that have strong individual, or in some cases, multiple policies in place, New York City didn’t have a precedent to follow for a larger, more comprehensive approach. Now that New York City has proven that a comprehensive approach is possible, other cities can review their approach and build upon it.

Targeted Focus

PlaNYC and its supporting research indicated that existing buildings should be the primary target for emission reductions in New York City. In 2030, it is expected that 85% of buildings will be buildings that currently exist. The city has a dense concentration of buildings, a factor that both contributes to high emission levels but also makes them easier to collectively address. For New York City, the evidence was clear that buildings were, and continue to be the largest single source of energy use and emissions. This will also be true for regions where carbon-dense coal and heating oil are relied upon as primary energy sources, such as the East Coast and Midwest.

Strong Stakeholder Engagement

The City received a great deal of assistance from its partners and stakeholders in the creation of the GGBP, a practice that could easily be replicated by other communities. The City created a forum that brought the right people forward. Russell Unger stresses the importance of having the “political will, City resources, and [real estate] industry’s blessing to make this possible” in other communities.³⁵ Adam Hinge echoed that sentiment by noting that there is a “need to have the commitment from the top, because it isn’t a simple process.”³⁶ Elected officials need to sponsor a plan, but a city also needs the support of industry champions, independent non profits, and volunteers to realize success. As Scott Frank recalls, “New York City relied on volunteer, in-kind contributions from the good will of a community of professionals. That worked well and could be duplicated. The process of soliciting independent nonprofits to do the leg work and background work to formulate a menu of measures made sense for New York City and was very shrewd.”³⁷ It’s important to note that a local government is never alone. There are always other individuals or organizations within a community that want to achieve the same goals, and are willing to come forward and help.

Charlotte Matthews recommends a hybrid of the *Greener, Greater Buildings Plan* approach and Green Codes Task Force processes. “*The Greener, Greater Buildings Plan* was lead from the beginning by the City, while the Task Force began with technical recommendations created by the volunteer experts. One offers more robust technical knowledge from the beginning, while the other has a more committed staff that may ultimately create a more robust law. You need people whose day job is to develop

³⁴ Scott Frank. Personal Interview. September 13, 2011.

³⁵ Russell Unger. Personal Interview. September 22, 2011.

³⁶ Adam Hinge. Personal Interview. September 8, 2011.

³⁷ Scott Frank. Personal Interview. September 13, 2011.

legislation so that it becomes technically sound, but the City can ask a non-City agency to organize and provide professional expertise and passion,” she said.³⁸ The GGBP was made possible through the support received both internally and externally. While not a simple feat, this is one that is possible anywhere.

Though New York City may not be unique in its ability to pass laws of this magnitude, Scott Frank does add, “We're fortunate in this town that we have some large and influential developers who really don't look at regulation as a negative; they look at it as an opportunity to further differentiate themselves from their competitors.”³⁹ Most communities will have a subset of business leaders and champions who want to be seen as driving change and leading the competition. Identifying and partnering with supporters from within the local real estate industry is essential to an effort on the scale of the GGBP.

B. Success Factors

Specific Goal or Focus

For those communities that follow New York City and other communities leading the way on existing building energy efficiency policy, there are a variety of factors that contributed to the success of the *Greener, Greater Buildings Plan*. New York City's Sustainability Plan, PlaNYC, laid the groundwork for the City's energy initiatives and outlined the targeted focus areas for the City. Therefore, increasing the energy efficiency of the city's existing buildings has been, and will continue to be, a central focus. New York City identified existing buildings over 50,000 square feet as their target, specifically because these larger buildings (almost 16,000 properties) make up approximately half of the citywide square footage and 45 percent of citywide greenhouse gas emissions.⁴⁰ Laurie Kerr cites, “We focused on existing buildings as the most important way to achieve citywide CO₂ reductions of 30% by 2030. We wanted to shift the conversation from new green buildings, which have been more popular, because the reality is that the big hits come from existing buildings and we needed to get people to see that. By focusing on only 16,000 properties, we're able to address the largest buildings that we've found are generally more sophisticated and able to comply with the new laws.”⁴¹ Adam Hinge also credits the fact that New York City “regularly updates emissions inventories, which gave a good baseline,” an indication of what was happening and what needed to take place.⁴²

Engaging the Right Stakeholders

Once a broad commitment or goal is in place, the next step is to conduct extensive outreach to ensure that the right stakeholders are engaged. Starting from within, there

³⁸ Charlotte Matthews. Personal Interview. September 26, 2011.

³⁹ Scott Frank. Personal Interview. September 13, 2011.

⁴⁰ The City of New York Website, *Greener, Greater Buildings Plan*.

⁴¹ Laurie Kerr. Phone Interview. October 25, 2011.

⁴² Adam Hinge. Personal Interview. September 8, 2011.

must be buy-in from City government, including elected officials. Russell Unger credits part of New York City's success to a "good political environment with the City Council and Mayor aligning on issues. A city must also have the resources to manage and staff, and the expertise to make something like this happen."⁴³ Once there is sufficient buy-in from the city level, the next step is recognizing who the powerful external players will be, and direct outreach and communication efforts to them. Saverio Grosso's advises, "Seek the council and the guidance of other state or city agencies that either can influence the larger groups of people, or help at least get an audience with a larger group of people."⁴⁴

New York City's real estate industry was viewed as playing a key role in the success of the *Greener, Greater Buildings Plan*. According to Charlotte Matthews, "[The real estate industry] knows they'll be affected by climate change, and they don't want to contribute [to that problem]. They still have to build a building, so they want to ensure there are workable solutions."⁴⁵ The industry was involved from the beginning, and their feedback helped shape parts of the GGBP. As with any political issue, there were negotiations involved, but in the end both parties were satisfied with the outcomes. Adam Hinge notes, "Other areas of the country try to take pieces of *Greener, Greater Buildings Plan* but often get shot down quickly because of their real estate community."⁴⁶ Due to strong mayoral leadership, New York City's real estate industry knew this legislation was coming and came to the table ready to listen, but also ready to have their voice heard.

Providing Supplemental Tools

Once stakeholders are aligned and legislation is in place, it is vital to follow up with training, financial options and additional outreach. Laurie Kerr recommends, "Giving building owners and managers the tools they need to comply. Much of New York City's time has been spent coordinating with partners to provide outreach and training."⁴⁷ New York City worked with partners to create a speaker's bureau to disseminate information about the new laws, and City leaders have worked hard to make sure financial assistance is available to building owners.

"Right now there is a need from the community because they care, and it is within their business interest so they're open to hearing from the City," said Russell Unger. He adds, "The City has an opportunity to talk to owners because they're looking at things for the first time; they [the City] might not have this opportunity again."⁴⁸ "As long as the regulations are rigorous, thorough, appropriate, and workable, they will say "Ok fine. We'll figure them out and we'll do a better job than our competitor; that's another area for us to compete," Charlotte Matthew explains. "Standards that protect our health and

⁴³ Russell Unger. Personal Interview. September 22, 2011.

⁴⁴ Saverio Grosso. Personal Interview. September 8, 2011.

⁴⁵ Charlotte Matthews. Personal Interview. September 26, 2011.

⁴⁶ Adam Hinge. Personal Interview. September 8, 2011.

⁴⁷ Laurie Kerr. Phone Interview. October 25, 2011.

⁴⁸ Russell Unger. Personal Interview. September 22, 2011.

reduce our reliance on foreign energy are positive,” Charlotte adds.⁴⁹ Inherently people want to do the right thing, and given all of the information necessary to make an informed decision, people will adhere because generally they know things need to get done.

C. Key Take-Aways

Comprehensive and Aggressive Approach

Of course, a plan of this size takes time and patience. Laurie Kerr shares, “It took three years from beginning the *Greener, Greater Buildings Plan* to pass the bills, and it has taken awhile after that to put everything in place. It will take time. Don’t try to do too much too soon.”⁵⁰ Given New York City’s experience, Laurie and the OLTPS have other lessons to share with jurisdictions too. Packaging the policies together was strategic on many levels, but Laurie credits packaging with supporting marketing efforts too. “By packaging the legislative pieces together and giving them a name, we branded the laws collectively which was very beneficial,” said Laurie Kerr.⁵¹

If a comprehensive package is too large of an effort, Laurie Kerr recommends starting with mandatory benchmarking and disclosure. “Increasing the knowledge base of the people that live in the city will ultimately lead to actions that will reduce overall energy consumption, help the city financially and improve the air quality. Regardless of where you begin, “Recognize that most of these requirements will be new and unknown and you’ll want them to make it as easy as possible for building owners,” Laurie notes as one of her biggest pieces of advice. She continues, “Don’t just create the requirements, but supplement them with assistance. There are lots of resources in a community; you just need to find the right partnerships.” Laurie concludes by adding a final recommendation, “Make sure that the building community knows these new requirements will be enforced.”⁵²

Address Stakeholders Early and Often

When pursuing a comprehensive policy approach to address existing buildings, start by identifying and pursuing partners in the real estate community. It is especially useful to connect with multi-national firms given that mandatory benchmarking, or other required energy efficiency measures, are traditionally standard practices for large global companies. Universities, hospitals and other large institutions generally want to further the public good and should also be pursued as initial partners. “The EPA has also been a great partner. They’ve created trainings and tools and helped address issues during the process,” Laurie Kerr adds.⁵³ Identifying and engaging early adopters, those who see the benefits, will pave the path towards continual stakeholder engagement down the road.

⁴⁹ Charlotte Matthews. Personal Interview. September 26, 2011.

⁵⁰ Laurie Kerr. Phone Interview. October 25, 2011.

⁵¹ Laurie Kerr. Phone Interview. October 25, 2011.

⁵² Laurie Kerr. Phone Interview. October 25, 2011.

⁵³ Laurie Kerr. Phone Interview. October 25, 2011.

Change Occurs at the Local Level

As a closing thought, Scott Frank made an interesting observation as to why New York City put the *Greener, Greater Buildings Plan* in place, and why other cities are likely to follow New York City's lead. "It may look like cities will lead in this area. New York State is a perfect example. At the state level, nothing is happening. At the federal level, we all know what's happening. This may be something that comes from the ground up; cities really need to do this. Municipalities, towns, and cities need to do this on their own. At some point we'll aggregate and bring together state and federal regulations. If we're going to get this important work done, we need to do it at the local level."⁵⁴ Laurie Kerr agrees, "Cities need to take the lead because they have jurisdiction over the building stock and they are centers of expertise in buildings."

⁵⁴ Scott Frank. Personal Interview. September 13, 2011.

i. Biographies

Hilary Beber is a Policy Advisor in the NYC Mayor's Office of Long-Term Planning and Sustainability. After graduating Cornell University with a degree in Environmental Engineering, Ms. Beber helped develop and pass the *Greener, Greater Buildings Plan* (GGBP), a package of legislation to address energy efficiency in New York City's existing buildings. She currently works on implementation and outreach efforts for the GGBP laws. Ms. Beber also participated in and assisted with the management of the Green Codes Task Force, a technical group that identified impediments and proposed improvements for green building in New York City's construction codes. Ms. Beber was honored as an Urban Green Council Service Award winner for her work on the Green Codes Task Force. Ms. Beber serves as a City representative on BOMA's Energy and Sustainability Committee as well as ASHRAE-NY's Sustainability Committee.

Mr. Scott Frank is a Partner with the firm of Jaros Baum & Bolles, a full service mechanical and electrical consulting engineering firm based in New York City and specializing in the design of large commercial and institutional projects located throughout the world. Since joining the firm in 1987, Mr. Frank has functioned as principal mechanical engineer for numerous new construction and retrofit project located both within the United States and abroad. Mr. Frank currently directs the sustainable design practice at JB&B. Mr. Frank holds Bachelors and Master's of engineering degrees from Cornell University, is a licensed Professional Engineer, a LEED Accredited Professional and is a founding and current Board member of the Urban Green Council (NY Chapter of the US Green Building Council).

As Regional Vice President of ENERActive Solutions, Saverio Grosso is responsible for the overall management of projects in the New York area. Saverio currently serves as a Regional Vice President for the Building Commissioning Association and has been instrumental in assisting the Mayor Bloomberg's Office of Long Term Planning and Sustainability in defining legislation as part of the Mayor's PlaNYC 2030 goals. Serving as an adjunct professor for the CUNY School of Professional Studies teaching the Building Operator Certification course, Saverio has conducted training courses for the Local 32BJ Training Foundation and Queensborough Community College. He also holds several certifications from the Association of Energy Engineers.

Adam Hinge manages Sustainable Energy Partnerships, a small consulting firm specializing in energy efficiency program and policy issues. Hinge is involved with a variety of efforts working toward improving building energy performance around the U.S. and globally. He is active in several relevant professional organizations including the American Society of Heating, Refrigerating & Air-Conditioning Engineers, and serves on the Board of Directors of the Institute for Market Transformation. Hinge has degrees in Mechanical Engineering from Rensselaer Polytechnic Institute, is a registered Professional Engineer in New York, and serves as an Adjunct Research Scholar for Columbia University's Center for Energy, Marine Transportation and Public Policy, a policy research center that is part of School of International and Public Affairs.

Laurie Kerr is the Senior Policy Advisor in the NYC Mayor's Office responsible for the development of New York City's green building and energy efficiency policies. She has been instrumental in the creation of PlaNYC, New York's influential plan for sustainable growth through 2030, including the New York City greenhouse gas reduction plan, the comprehensive policies to reduce energy efficiency in existing buildings, the greening of the city's codes and regulations, and energy-aligned lease language. She has over 15 years experience practicing architecture, and has written articles on architecture for the Wall Street Journal, Slate, and Architecture. Prior to receiving her Master's in Architecture from Harvard, Laurie earned degrees in engineering and applied physics. She was given the AIANY Public Architect Award for 2011.

Charlotte Matthews is responsible for Related's corporate sustainability strategy and its green development activity. Ms. Matthews is an assistant adjunct professor at Columbia University –GSAPP Real Estate Development and a board member of the Institute for Market Transformation. She has been very

involved in recent green building legislation through the New York City Green Codes Industry Advisory Committee, Real Estate Board of New York - Sustainability Committee and Real Estate Roundtable – Sustainability Policy Advisory Committee. Matthews has also served on the LEED for New Construction core committee and helped with the consolidation of LEED from multiple specialized rating systems into one. Ms. Matthews holds a Bachelor of Science in Environmental Science from Brown University.

Russell Unger is the Executive Director of Urban Green Council, the U.S. Green Building Council of New York. Russell spearheaded GRPO, the Green Construction Skills Training Program for trade professionals, and convened the Green Codes Task Force at the request of Mayor Bloomberg and City Council Speaker Quinn. Prior to joining Urban Green Council, he drafted and led negotiations on many environmental laws - including the City's green building law (Local Law 86) - while serving as Legislative Counsel for three City Council committees. Russell received his law degree from New York University School of Law, cum laude, and his undergraduate degree from McGill University, first class honors. Russell serves on numerous advisory boards and committees, including the NYC Energy Policy Task Force and the Department of Environmental Protection Green Infrastructure Citizen's Group.

References

Con Edison. Energy Efficiency. Greener, Greater Buildings Plan-Benchmarking. Last accessed 11.2.11
http://www.coned.com/energyefficiency/city_benchmarking.asp

Frank, Scott. Partner, Jaros Baum & Bolles (JBB). Interview by Ryan Foshee. New York, NY, September 13, 2011.

Grosso, Saverio. Regional Vice President, ENERActive Solutions. Interview by Ryan Foshee. New York, New York, September 8, 2011.

Hinge, Adam. Managing Director, Sustainable Energy Partnerships. Interview by Ryan Foshee. New York, NY, September 8, 2011.

HRA&A Advisors. Building the New York City Energy Efficiency Corporation. Last accessed 11.2.11
<http://www.hraadvisors.com/news/nycenergyefficiency.shtml>

Kerr, Laurie. Senior Policy Analyst, New York City Office of Long Term Planning and Sustainability. Interview by Kim Brokhof via phone. October 25, 2011.

Matthews, Charlotte. Vice President, Sustainability for Related. Interview by Ryan Foshee. New York, NY, September 26, 2011.

Russell Unger. Executive Director, US Green Building Council New York Chapter (Urban Green Council). Interview by Ryan Foshee. New York, NY, September 22, 2011.

The City of New York. Department of Finance. Forms and Publications. New York City Government Building Energy Benchmarking Reports. Last accessed 11.2.11.
http://www.nyc.gov/html/dof/html/pub/pub_reports_other_benchmarking.shtml

The City of New York. Office of the Mayor. PlaNYC : Greener Greater Buildings Plan. Last accessed 11.2.11 <http://www.nyc.gov/html/planyc2030/html/about/ggbp.shtml>

The City of New York. Office of the Mayor. PlaNYC: A Greener, Greater New York. April, 22, 2007. Last accessed 11.2.11 http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/full_report_2007.pdf

The City of New York. Office of the Mayor. PlaNYC: A Greener, Greater New York. April 2011. Last accessed 11.2.11 http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_planyc_full_report.pdf

The City of New York. Office of the Mayor. PlaNYC. The Plan. Last accessed 11.2.11 <http://www.nyc.gov/html/planyc2030/html/theplan/the-plan.shtml>

The City of New York. Office of the Mayor. Sustainability Benchmarking, Frequently Asked Questions. Last accessed 11.2.11 http://home2.nyc.gov/html/dob/html/sustainability/benchmarking_faqs.shtml

The Sallan Foundation. *Greener, Greater Buildings Plan*. Last accessed 11.2.11. http://www.sallan.org/pdfs/docs/Greener_Greater_workforce_and_financing.pdf

Urban Green Council. NYC Green Codes Task Force. Last accessed 11.2.11 <http://www.urbangreencouncil.org/greencodes/>

For more information on New York City's sustainability plan development, please see ICLEI's in-depth report "The Process Behind PlaNYC." <http://www.icleiusa.org/planyc>

For more information on implementing Commercial Energy Rating and Disclosure Policies, please see IMT's report "Building Energy Transparency." http://www.buildingrating.org/Building_Energy_Transparency_Implementation_Report