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Deputy Director, Green Buildings & Energy Efficiency

Office of Long Term Planning and Sustainability

New York City

At the New York City Council

Committee on Housing and Buildings

Respecting Proposed Intros. 0013, 0014, 0016, 0093, 0184, 0202, 0203, and

Preconsiderations T-0245, T-0553, and T-0794

April 2, 2014

Good morning, Chair Williams and members of the committee. I am John Lee, Deputy Director for Green Buildings and Energy Efficiency in the Mayor's Office of Long Term Planning and Sustainability and a registered architect in the State of New York. Thank you for the opportunity to testify today on ten bills that address a variety of sustainability issues related to design and construction: training of building operators in energy efficiency practices ; ensuring the proper sizing and

installation of heating and cooling equipment in buildings; the insulation of pipes in existing buildings when walls are opened up; the control of mold growth in moisture-prone locations; the thermal performance of exterior walls and other building components; support of public stair use in buildings to promote increased physical activity; and the protection of street trees.

Seven years ago, the City set forth PlaNYC, a comprehensive plan to reduce greenhouse gas emissions and improve our environment. Because New York City's buildings consume most of our energy and have a major impact on the city's environment, the "greening of the city's codes" will help the City achieve many of PlaNYC's goals, including cleaner air, the reduction of waste sent to landfills, and a 30% reduction in citywide greenhouse gas emissions by 2030 – a goal that was codified in Local Law 22 of 2008.

In order to "green the city's codes", Urban Green Council, the local chapter of the US Green Building Council, assembled and managed a Green Codes Task Force charged with generating proposed changes to New York City's codes and rules to increase the sustainability of the building sector and reduce energy consumption in buildings. Out of that effort came 111 proposals, 48 of which have already been incorporated into New York's laws, rules, or practice. The ten bills pertaining to green codes under consideration today originated as Green Codes Task Force proposals.

The Office of Long Term Planning and Sustainability is pleased to testify in general support of today's introductory bills, although our support is tempered by certain caveats and suggestions for refinements that would help make the bills more

workable or that would address inconsistencies with regulatory requirements and industry practices. These introductions will help achieve the City's sustainability goals in measureable ways. Improvements in efficiency in the city's largest buildings will result in a greenhouse gas emissions reductions and decreased annual energy expenditures citywide. Reduced demand for energy will not only result in cost savings for New Yorkers but also result in reductions in the emissions of air pollutants from the burning of fossil fuel within buildings and at electrical power plants yielding cleaner air and improved health. Indoor air quality and public health can also be improved through better construction materials and designs that encourage active lifestyles.

The comments that we are presenting today represent our initial thoughts about these introductory bills, including some suggestions for refinements. We are looking forward to hearing the testimony of today's other witnesses to ensure that we fully understand the technical issues raised by each of them.

Intro 0013, ***Training Building Operators in Energy Efficiency,*** would improve the operations of building systems by ensuring that a person in a position of direct responsibility for the operation of that building has been trained in energy efficiency best practices. When fully implemented, this regulation alone has the potential to reduce the city's greenhouse gas emissions by nearly three percent by the year 2030. As such, it is the single most impactful proposal on the city's carbon footprint of all the Green Codes Task Force proposals. We support this important energy proposal with the understanding that some details concerning acceptable training curricula and credential maintenance details still need to be resolved. We advocate for a board of directors comprised of stakeholder interests and industry

experts, to be convened to work through these details as the administrative rules to implement the law are developed. Furthermore, we recommend extending the compliance date in order to provide the industry adequate time to educate operators. We look forward to working with council and the department of buildings on these refinements.

Intro 0014, ***Improve Heating & Cooling Load Estimates at Time of Design,*** would help ensure that the mechanical systems used to heat and cool buildings are correctly sized for the building they are to serve. Often designers use rules of thumb to select the sizes of equipment to be used in a particular building design. Intro 0014 would require applicants for a building permit to indicate on the application documents the calculated heating and cooling loads for the project and the corresponding performance values of the relevant equipment selected. We support this council bill as a means for the department of buildings to validate and enforce quality engineering practices that produce buildings that function at an optimum level.

Intro 0016, ***Require Insulation of Existing Concealed Pipes Exposed During Alterations or Repair,*** would require that uninsulated pipes in existing buildings that carry hot and cold water and other fluids as part of the mechanical systems of the building be covered with insulation when exposed during renovations. Uninsulated pipes cause thermal losses in the fluids traveling within them, leading to increased energy use to maintain the intended temperatures at the end of the pipe run. Current codes require that mechanical system piping be insulated, however pipes that were installed many decades ago before our current

codes may not be covered with insulation. Intro 0016 would require such existing pipes to be covered with insulation when those pipes are exposed during the course of construction. The extra insulation will lead to reduced energy use in existing buildings by preserving the temperature of the fluid within pipes in walls. We support this council bill.

Int 0093, *Require Mold-Resistant Gypsum Board and Cement Board In Moisture-Prone Locations*, will amend the City's building code to require the use of cement board in shower areas and bath surrounds and require the use of gypsum board or cement board with a mold resistance rating of 10 in accordance with reference standard ASTM D3273 in areas of continuous high humidity or direct exposure to water. Molds can grow on almost any surface as long as moisture and oxygen are present and are known allergens, irritants, and producers of toxins. In New York City, where the asthma hospitalization rate in some neighborhoods is four times as high as the national average, complaints of mold infestations continue to rise. While it is impossible to eliminate all mold and its spores in the indoor environment, mold growth can be controlled. Cement board has better long-term performance than conventional wall board materials because it does not mildew, provide a food source for mold growth, or physically break down in the continued presence of moisture or leaks. Adoption of this measure will result in substantially improved indoor air quality, with associated reductions in illnesses and related losses to productivity and quality of life. We wish to point out that the provisions of this bill pertaining to the use of cement board in wet areas such as showers and water closet compartments is included in Local Law 141 of 2013 which was recently

signed into law and amends the Building Code. This introduced bill also requires the use of mold-resistant materials for other moisture-prone areas such as laundry rooms and basements.

We generally support this bill but recommend that it be reviewed for coordination with the provisions of Local Law 141 of 2013. We look forward to working with council and the department of buildings on this necessary reconciliation.

Int 0184, *Limit Heat Loss Through Exterior Walls*, would resolve a deficiency in the city's energy conservation code requirements for exterior walls of buildings. Exposed floor slab edges at the exterior walls of buildings and sleeves for through-wall equipment are not presently required to be accounted for in the thermal design and reporting requirements of the energy code. Heat loss occurs at exterior walls through exposed slab edges and air infiltration into the through-wall equipment sleeves. By requiring that the thermal performance of these elements be accounted for in the building design, all exterior wall elements will be held to the highest performance standards, and building owners will save a great deal of energy while building occupants will be more comfortable for less cost. We support the intent of this council bill, however the proposed methodologies for calculating the thermal impact of slab edges and the impacts of through-wall sleeves on building thermal performance need refinement, and the cost implications of these requirements warrant further study, particularly with respect to affordable housing. We also wish to point out that this bill amends sections of the New York city energy conservation code. New York State is moving to enact a new energy code which by law must be adopted by the city. It is expected that the new state energy code will

be enacted sometime this summer. We recommend that the council delay action on this bill until the language of this bill can be coordinated with the coming energy code and that the effective dates of this bill coincide with the effective dates of the new energy code. We look forward to working with council and the department of buildings on further refining the technical provisions of this bill.

Int 0202, ***Public Access Stairways***, seeks to promote public health and prevent obesity by requiring new buildings and existing buildings that undergo a significant renovation to designate a public access stairway. In order to ensure that the public access stairway is open, accessible and functional, it would also impose requirements on these buildings regarding: (i) access to the stairway; (ii) fire-rated vision glass in the stair door or in the wall next to the door; and (iii) signage providing directions to the public access stairs and reminders to building occupants to take the stairs. The legislation would amend the Administrative Code and Building Code as amended by Local Law 141 of 2013. Obesity has reached epidemic levels; more than half of New York City adults are overweight or obese and at a higher risk for many chronic diseases, and these risks are exacerbated by physical inactivity. Just two additional minutes of stair climbing per day can burn enough calories to prevent the average annual weight gain of U.S. adults, and climbing about three to five floors per day, on average, can decrease stroke risk, promote greater lower limb strength, and improve cardiovascular health.

Visibility of stairs and stair prompt signs that encourage stair use for health benefits placed at elevators have been shown to consistently increase stair use, with a median increase of 50% across multiple studies. Additional benefits of stairway

use include lower building operational and maintenance costs due to reductions in elevator and escalator use, and improved familiarity with emergency and fire safety protocols with increased knowledge of stair location. We are in support of the intent of this council bill. We are looking forward to working with the council and the departments of health and buildings to finalize this bill.

Int 0203, *Hold-Open Devices and Automatic Closing of Exit Doors Serving Vertical Exit Enclosures*, would amend the Building Code and Fire Code to permit limited, voluntary use of hold-open devices on stairway exit doors in order to improve accessibility and visibility of stairways, thereby encouraging their use. It would permit such devices to be used on one exit stairway per building to connect no more than three levels, which must be consecutive, and requires such devices to comply with testing, inspection, monitoring and fire safety requirements. The legislation would also require such devices to close the door automatically in the event that the building's fire alarm or smoke detection systems are activated. Measures that increase the visibility of stairs have been shown to increase their use. Moreover, other jurisdictions have successfully adopted the use of hold-open devices; they are permitted by the International Building Code and various other local building codes around the country, including the Chicago and Kentucky building codes. Accordingly, and consistent with the recommendations of the New York City Green Codes Task Force, this legislation is being proposed in conjunction with the Public Access Stairway legislation to promote stairway use in New York City by making stairways more accessible, visible and functional and thereby

promoting physical activity and public health. As with Int 0202, Public Access Stairs, we support this council bill.

Preconsideration T-0245, *Building System Commissioning*, would require that new buildings and major renovations that include the replacement of major mechanical equipment have certain systems commissioned to confirm that these systems perform as designed. Requiring system commissioning for new building systems ensures that these systems are functioning as intended and the building is using the least amount of energy necessary. Proper building systems commissioning would lead to a healthier and more comfortable interior environment for the building's occupants while maintaining control of energy use and costs. We support this council bill, but note that the requirements need to be developed in more detail. We look forward to working with council and the department of buildings in identifying and refining the systems and procedures required by this bill. We also wish to point out that this bill amends sections of the New York city energy conservation code. New York State is moving to enact a new energy code which by law must be adopted by the city. It is expected that the new state energy code will be enacted sometime this summer. We strongly recommend that the language of this bill be coordinated with the coming energy code and that the effective dates of this bill coincide with the effective dates of the new energy code.

Preconsideration T-0553, *Construction Site Lighting*, will amend the City's building code to set minimum illumination efficacy standards for temporary construction site lighting, meaning that highly efficient light bulbs only would be

allowed. New York City construction sites are commonly illuminated with inefficient incandescent light bulbs. Typically, temporary construction site lights remain on all the time. The Building code does not presently mandate minimum energy efficiency standards for temporary construction lighting and power, as it does for permanent installations. The high efficacy lamps specified in this proposed legislation use 65 to 75 percent less energy than incandescent lamps to provide the same amount of light and can last up to 10 times longer. Implementing this proposed legislation will save substantial energy, reducing greenhouse gas emissions and improving air quality in the process. We support this council bill.

Preconsideration T-0794, *Protecting Street Trees During Construction Activities*, would safeguard street trees from damage due to construction activities and the installation of temporary sidewalk bridges. OLTPS is working with the Department of Parks and Recreation to establish rules for required practices by contractors and building owners during construction activities in the vicinity of street trees. This bill would establish a mechanism within the building code to aid in the enforcement of these rules. We support this council bill and look forward to working with council, the department of parks and recreation, and the department of buildings in the refinement of this legislation.

Thank you for the opportunity to testify on this important legislation. I am happy to answer any questions that you may have at this time.

I also recognize James Colgate, Assistant Commissioner for Technical Affairs and Code Development of the Department of Buildings, and Christine Johnson,

Assistant Commissioner for Chronic Disease Prevention and Tobacco Control of the Department of Health & Mental Hygiene, who are also available to answer questions.

Testimony of the Department of Buildings
New York City Council
Committee on Housing and Buildings
Intro 181
April 2, 2014

Good morning Chairman Williams, and members of the Committee. I am James Colgate, Assistant Commissioner for Technical Affairs & Code Development at the New York City Department of Buildings, and have with me, Donald Ranshte, Director of Intergovernmental Affairs and Executive Analytics. Thank you for allowing me the opportunity to testify on this legislation.

This bill would amend the administrative code of the city of New York in relation to community board review of hotel development plans. As you know, building and development uses, for the most part, are governed by the Zoning Resolution. An 'as-of-right' development complies with all applicable zoning regulations and does not require any discretionary action by the City Planning Commission or Board of Standards and Appeals.

While clearly rooted in a desire to inform communities about local development, we suspect that this bill may present the appearance of local control, without any genuine role spelled out in the proposed legislation for the community board. Typically, if a hotel development requires land use changes under the ZR, then a Community Board hearing would already be required pursuant to ULURP and this bill's required hearing would be redundant. On the other hand, if the project is as-of-right based on existing zoning, then the Department of Buildings would have no authority to deny permits, a ministerial act under the Charter, on the basis of a review by the Boards.

From our perspective, the proposed legislation raises a whole host of operational questions. From the simple; 'does the Department also provide a full set of plans, and, how are they delivered, or would the applicant just submit a narrative and general rendering of the proposed building to the Board?' To the more difficult: 'what if those plans are subsequently amended, as often happens, would it need to go back to the Board? Or, 'what if it's a proposed mixed use building to be used as a hotel with residential use and/or other commercial uses? Is the whole project the subject of the hearing?' To the very complex: 'what if the developer does not propose hotel use during plan exam or building, and only changes the proposed use after the building is already built?'

There may also be some unintended consequences. Apartment hotels are use group 2 uses, not use group 5 uses, and are for permanent residence purposes, unlike transient hotels. They typically are no longer developed, but some still exist. Making it more difficult to develop residences does not appear to be the intent of this bill, but it may. This could have an adverse effect on the new construction of affordable housing.

If the overall intent of the bill is truly geared toward community notification, the Department of Buildings has made great strides towards engaging local communities. As you know, we are very proud of our website, and on it, there are two very important community engagement portals. First is the "Buildings on my Block" page. With five clicks of a mouse on your computer, any person can find all of the approved applications for New Buildings, Alteration Type 1 and Demolition sorted by community board. When we speak to the Boards, we always remind them that their staff can easily see all new permit approvals by DOB on a daily, weekly or monthly basis. Second, is the "Public Challenge". Again, simply by using our website, subject to the required process and time frame, any member of the public can send us a challenge to a permit approval, to which our Borough Commissioner will post answers on the internet for all to see. Our outreach staff can give a tutorial to your offices, or any Community Board offices interested in seeing how this works.

Finally, since Community Board review is purely advisory, we are concerned that the public hearing process would create the misperception that the community's opposition will result in the denial of a permit. DOB's review is limited to compliance with Code and Zoning. It must issue a permit based on such compliance. We wouldn't want to create a hostility directed at the Department, or the City as a whole, where we must issue a permit that the Board has reviewed and opposed.

Thank you for the opportunity to speak about his issue. I would be happy to answer any questions you may have.

FOR THE RECORD

TESTIMONY IN SUPPORT OF T2014-0701 and T2014-0702

Submitted by: Les Bluestone, Partner, Blue Sea Development Company, LLC

To: New York City Council Housing and Buildings Committee, Council Member Jumaane Williams, Chair

Good morning Chairperson Williams and members of the New York City Council, I am Les Bluestone, a partner of Blue Sea Development Company, an affordable housing firm that supports the two pieces of legislation in front of you, designed to encourage stair use in a variety of buildings. I apologize for not being able to deliver my remarks in person. I am also a founding board member of the Center for Active Design, a non-profit organization whose mission is to reduce the risk of obesity and chronic diseases by promoting physical activity and healthy food access through the design of buildings, streets, and neighborhoods.

Our company's long history in affordable housing has recently culminated in the development of "The Melody" and "Arbor House," two LEED Platinum buildings in the South Bronx that were both developed in accordance with the Active Design Guidelines, a comprehensive set of volumes created to help architects and developers like myself, improve people's health through the built environment. In fact, The Melody was the first building in the country to be awarded a LEED credit for physical fitness by the US Green Building Council and Arbor House is the first residential building with a rooftop hydroponic farm that grows pesticide free fresh produce for distribution to the community.

For many people, having a building subscribe to "do no harm" principals of the Hippocratic oath, is probably the most they could expect from our built environment. The bad news is that the overall health of the population has declined in recent years, with large increases in chronic diseases such as obesity, heart disease and diabetes. The good news is that we have tools at our disposal to help reverse these trends, namely the buildings where we live, work and visit. Most every building in New York City has at least one stairwell, which the use of has been proven to burn calories and increase weight loss.

As an example, at Arbor House, we made a number of specific design and material decisions to make using the stairs not only practical, but enjoyable as well:

- The building's street entrance was relocated so the stairwell doors are visible in the lobby.
- The solid steel stairwell doors were replaced with fire rated glass doors, which increase security as well as show where the stairs are.
- The stairwell width was increased by 20%; improved lighting, artwork and

music were added to each stairwell

- Humorous sign prompts to encourage stair use were placed outside every stair door and at each of the elevator doors

These calculated measures have proven to be very successful in our buildings these were done on an affordable housing budget, so we know it can be done! Similarly, the two pieces of legislation you have in front of you, Legislative Bills TS2014-0701 and TS2014-0702, are very simple and are a fairly low cost means toward promoting stair use in buildings throughout the City. If we want people to use the stairs, accessability and safety are key, and the use of fire rated glass and magnetic hold opens certainly help to achieve this.

We can understand the health benefits of physical activity and stair use on a macro level, but you might be wondering why a developer should be concerned about such things. First, as an affordable housing developer, the population we serve happens to have a disproportionately high incidence of obesity, heart disease and diabetes as compared to the overall population. It's also no secret that low-income families are more susceptible to financial hardship as the result of chronic and serious medical issues. If one wanted to be cynical, you could say that keeping families healthy helps an owner's bottom line, which may in fact be true, but in keeping with Mayor DiBlasio's agenda, we owe it to ourselves to make changes that benefit the entire population wherever possible and access to stairs is a great place to start.

We now incorporate Active Design principles, of which stair use is a major component, on all of our affordable housing developments, including the Prospect Plaza HOPE VI development of 364 apartments in Brooklyn and the Melrose Commons North development of 272 apartments in the South Bronx. I strongly support these legislative bills (TS2014-0701 and TS2014-0702) and encourage you to pass them as a way to promote physical activity and improved health for all New Yorkers.

FOR THE RECORD

ASSOCIATION FOR
ENERGY AFFORDABILITY INC.

105 Bruckner Boulevard New York, NY 10454 • Phone: 718.292.6733 • Fax: 718.292.1914

April 1, 2014

To: Chair Jumaane Williams and the New York City Council Committee on Housing & Buildings

From: David Hepinstall, Executive Director, Association for Energy Affordability

Regarding: Letter in Support of

Int 0013-2014
A Local Law to amend the administrative code of the city of New York, in relation to requiring the base building systems of certain buildings to be operated by individuals with a certificate in building energy efficiency from an approved program.
Int 0013-2014
A Local Law to amend the New York city mechanical code, in relation to requiring analysis of heating and cooling needs during building design.
Int 0014-2014
A Local Law to amend the administrative code of the city of New York, in relation to requiring insulation of existing concealed pipes exposed during alterations or repair.
Int 0181-2014
A Local Law to amend the administrative code of the city of New York, in relation to the allowable maximum heat loss through building walls.
T2014-0702
A Local Law to amend the administrative code of the city of New York and the New York city energy conservation code, in relation to system commissioning.
T2014-0245
A Local Law to amend the New York city building code, in relation to construction site lighting.

I wish to applaud the City Council, Green Codes Task Force and the Mayor's Office of Sustainability for this legislation addressing code issues that will serve to improve the energy efficiency and good maintenance of New York City buildings and kindly ask the City Council to act favorably on these bills.

Since its inception in 1992, the Association of Energy Affordability (AEA) has promoted both technical advances and training to conserve energy use in NYC's residential buildings. AEA is recognized as one of the foremost advocates, training and technical services providers for energy efficiency nationwide. AEA's staff delivers a broad range of energy efficiency services resulting in energy savings in single family homes to high rise apartment buildings. AEA has administered energy efficiency programs for NYSERDA, Con Edison and KeySpan/National Grid, often in cooperation with its membership network of New York State Housing and Community Renewal (HCR)-funded Weatherization Assistance Programs (WAP) subgrantees.
From this vast experience, AEA can attest that the conditions the legislation intends to remedy are frequent causes of energy loss and resident discomfort in multifamily buildings. Much energy is lost due to oversized heating, ventilation and air conditioning systems in buildings. Once installed, this expensive equipment will serve for 20 years. Requiring load analyses and detailed specifications of proposed HVAC equipment to be included in construction documents submitted to DOB will allow for proper plan review and installation of the most appropriate systems to provide maximum comfort to inhabitants while minimizing energy consumption.

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Commissioning of mechanical, related and service water heating systems in newly constructed buildings is an important step in insuring that new buildings function as they were designed. It would eliminate fuel waste, tenant discomfort and unnecessary greenhouse gas emissions that may result when errors occur in system installation.

AEA has embarked on new, leading-edge training and certification programs supporting the Passive House movement in association with the Passive House Academy of Ireland. This movement demonstrates that a well-insulated thermal performing building envelope can greatly reduce the sizing of the HVAC systems. In many buildings AEA audits, heat loss through poorly installed windows and insulated mechanical penetrations, particularly AC sleeves, is considerable. Increasing the R-Values of building envelopes will both save money in HVAC equipment purchase and operations and reduce greenhouse gas emissions. Similarly, insulation of concealed pipes when practicable will aid in energy loss, overheating and mold growth.

Light emitting diode (LED) technology has advanced particularly for exterior use. I support the proposed legislation to mandate higher efficiency lighting for construction sites.

Finally, AEA has supported training requirements for building operators for many years. AEA is a U.S. Department of Energy (DOE)-funded National Weatherization Training Center and a BPI Test Center. For over 10 years, AEA has regularly offered training in preparation for certifications in almost all BPI job designations, including Multifamily Building Analyst, Energy Efficient Building Operations Specialist, Residential Building Analyst, Envelope Professional, Heating Professional, and AC/Heat Pump Professional. Increased skill levels are required to improve building performance and effectively manage the often complex technologies facilitating energy efficiency. We have seen buildings that underwent extensive energy saving retrofits not make their performance targets because the heating systems were not scheduled and monitored properly due to operator error. Conversely, training can motivate operators to improve building performance and advance innovations.

I wish to thank the City Council for the opportunity to present my views in support of the proposed legislation. I also extend an invitation to visit us at AEA to see our teaching laboratories, passive house demonstration, and green roof with solar thermal and photovoltaic panels.

Regards,

David Hepinstall
Executive Director

WE ACT FOR ENVIRONMENTAL JUSTICE

Achieving Environmental Justice by Building Healthy Communities Since 1988!

April 2, 2014

Hon. Jumaane Williams, Chair
Committee on Housing and Buildings
New York City Council
City Hall
New York, NY 10007

FOR THE RECORD

Re: ***Int. No. 13*** *- In relation to requiring the base building systems of certain buildings to be operated by individuals with a certificate in building energy efficiency from an approved program.*
Int. No. 14 *- In relation to requiring analysis of heating and cooling needs during building design.*
Int. No. 16 *- In relation to requiring insulation of existing concealed pipes exposed during alterations or repair.*
Int. No. 93 *- In relation to requiring the use of mold-resistant gypsum board and cement board in moisture-prone locations.*
Int. No. 184 *- In relation to the allowable maximum heat loss through building walls.*
Int. No. 202 *- In relation to public access stairways.*
Int. No. 203 *- In relation to hold-open devices and automatic closing of exit doors serving vertical exit enclosures.*
Preconsidered Int. No. *- In relation to construction site lighting.*
Preconsidered Int. No. *- In relation to protecting street trees during construction activities.*
Preconsidered Int. No. *- In relation to system commissioning.*

Dear Chair Williams,

I am writing on behalf of WE ACT For Environmental Justice, a 25-year-old non-profit, Harlem-based advocacy organization with several hundred members and supporters. WE ACT is committed to building healthy communities by assuring that people of color and low income participate meaningfully in the creation of fair and equitable environmental health and protection policies and practices. WE ACT, the first environmental justice organization created in New York is well known for its leadership in the national Environmental Justice Movement as well as for its local work that has secured the retrofit of the North River sewage treatment plant in West Harlem, the transformation to cleaner buses of the entire MTA/NYC Transit fleet, and improved children's environmental health in the indoor environment. WE ACT's commitment to healthy green buildings was evidenced by its architect receiving the 2008 Green Building Competition for New York City for its proposed green building in Harlem.

As a member of the mayor's Sustainability Advisory Board for PLANYC, WE ACT enthusiastically supports the green building legislation which is on the Committee of Housing and Building's agenda today. We all spend most of every day inside New York City buildings, making the building code a crucial tool for ensuring the health and safety of New Yorkers.

The building code also has a uniquely positive impact on carbon pollution and global warming. By 2030, green codes measures already implemented will reduce citywide carbon emissions by almost 5%, and lower daily water consumption by the equivalent of 30 Central Park Reservoirs. But codes requirement constant improvement to stay on the cutting edge and enable economic development in New York City.

The Council has a long tradition of city, state, and national leadership in green codes. The Committee is to be commended for taking up a serious slate of green bills early in its term. The current set of bills are worthy of close attention and quick passage, and we encourage the Council to continue its work on green codes beyond this bill package.

Buildings in New York City create 75% of the carbon pollution and use 85% of the electricity of our city. A well-trained workforce is essential to improving these numbers (Int 13) as well as for economic development and better jobs. By requiring designs to incorporate actual heating and cooling needs (Int 14) and account for actual heating losses through building walls (Int 184) systems will be properly sized, making them less expensive and more efficient. Cost-effective strategies like insulating exposed pipes (Int 16), using energy-efficient bulbs on construction sites (Preconsidered) and making sure buildings are commissioned so they work properly after construction (Preconsidered) have been thoroughly tested by market leaders and are ready to have their benefits spread to all.

New Yorkers' health, especially children who are most susceptible to asthma and other respiratory issues, will be improved by making sure bathrooms and other wet areas do not grow mold (Int 93). The Council can encourage health through active design by making stairs more accessible and usable (Int 202 and 203). Since mold prevention and ensuring stairs are usable during a power outage are also key for building resiliency, these bills have renewed urgency since Sandy.

We look forward to supporting the Council in its efforts to build a healthier, greener, and more resilient New York.

Respectfully submitted,

Peggy Shepard

Peggy Shepard
Executive Director, Co-Founder

FOR THE RECORD

ASHRAE New York Chapter

April 2, 2014

Hon. Jumaane Williams, Chair
Committee on Housing and Buildings
New York City Council
City Hall
New York, NY 10007

Re: ***Int. No. 13*** *- In relation to requiring the base building systems of certain buildings to be operated by individuals with a certificate in building energy efficiency from an approved program.*
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Preconsidered Int. No. *- In relation to construction site lighting.*
Preconsidered Int. No. *- In relation to protecting street trees during construction activities.*
Preconsidered Int. No. *- In relation to system commissioning.*

Dear Chair Williams,

We are the Local New York Chapter of the American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE), whose mission is to advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world.

ASHRAE New York Chapter enthusiastically supports the green building legislation on the Committee of Housing and Building's agenda today. We all spend most of every day inside New York City buildings, making the building code a crucial tool for ensuring the health and safety of New Yorkers.

The building code also has a uniquely positive impact on carbon pollution and global warming. By 2030, green codes measures already implemented will reduce citywide carbon emissions by almost 5%, and lower daily water consumption by the equivalent of 30 Central Park Reservoirs. But codes requirement constant improvement to stay on the cutting edge and enable economic development in New York City.

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We look forward to supporting the Council in its efforts to build a healthier, greener, and more resilient New York.

Respectfully submitted,

Ramez Afify, PE
ASHRAE New York Chapter President

JOHN J. MURPHY
JATC Co-Chair - Labor

Ph. (718) 752 - 9630

PLUMBERS LOCAL UNION No.1 TRADE EDUCATION FUND
JOINT APPRENTICESHIP AND TRAINING COMMITTEE

PLUMBERS EDUCATION GASFITTERS

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ARTHUR O. KLOCK JR.
Director of Trade Education

April 2, 2014

Hon. Jumaane Williams, Chair
Committee on Housing and Buildings
New York City Council
City Hall
New York, NY 10007

FOR THE RECORD

Re: ***Int. No. 13*** *- In relation to requiring the base building systems of certain buildings to be operated by individuals with a certificate in building energy efficiency from an approved program.*
Int. No. 14 *- In relation to requiring analysis of heating and cooling needs during building design.*
Int. No. 16 *- In relation to requiring insulation of existing concealed pipes exposed during alterations or repair.*
Int. No. 93 *- In relation to requiring the use of mold-resistant gypsum board and cement board in moisture-prone locations.*
Int. No. 184 *- In relation to the allowable maximum heat loss through building walls.*
Int. No. 202 *- In relation to public access stairways.*
Int. No. 203 *- In relation to hold-open devices and automatic closing of exit doors serving vertical exit enclosures.*
Preconsidered Int. No. *- In relation to construction site lighting.*
Preconsidered Int. No. *- In relation to protecting street trees during construction activities.*
Preconsidered Int. No. *- In relation to system commissioning.*

Dear Chair Williams,

The Trade Education Fund provides training to the more than 6000 members of Plumbers Local 1 in New York City. We provide the vocational education that raises young men and women into the middle class and we provide continuing education as they move forward in their construction careers.

Plumbers Local Union No.1 and the Trade Education Fund enthusiastically support the green building legislation on the Committee of Housing and Building's agenda today. Our members spend most of every day inside New York City buildings, making the building code a crucial tool for ensuring the health and safety of New Yorkers.

The health and safety of New Yorkers is something that plumbers have been concerned about since the Croton Aqueduct opened in 1842. The building code has a uniquely positive impact on water consumption rates as well as on carbon pollution and global

warming. By 2030, green code measures already implemented will lower daily water consumption by the equivalent of 30 Central Park Reservoirs, and reduce citywide carbon emissions by almost 5 percent.

Buildings in New York City create 75% of the carbon pollution and use 85% of the electricity of our city. A well-trained workforce is essential to improving these numbers (Int 13) as well as for economic development and better jobs. By requiring designs to incorporate actual heating and cooling needs (Int 14) and account for actual heating losses through building walls (Int 184) systems will be properly sized, making them less expensive and more efficient. Cost-effective strategies like insulating exposed pipes (Int 16), using energy-efficient bulbs on construction sites (Preconsidered) and making sure buildings are commissioned so they work properly after construction (Preconsidered) have been thoroughly tested by market leaders and are ready to have their benefits spread to all.

New Yorkers' health, especially children who are most susceptible to asthma and other respiratory issues, will be improved by making sure bathrooms and other wet areas do not grow mold (Int 93). The Council can encourage health through active design by making stairs more accessible and usable (Int 202 and 203). Since mold prevention and ensuring stairs are usable during a power outage are also key for building resiliency, these bills have renewed urgency since Sandy.

We must remember that codes require constant improvement to stay on the cutting edge and promote economic development in New York City. The Council has a long tradition of city, state, and national leadership in green codes. The Committee is to be commended for taking up a serious slate of green bills early in its term. The current set of bills are worthy of close attention and quick passage, and we encourage the Council to continue its work on green codes beyond this bill package.

Plumbers Local Union No.1 and the Trade Education Fund look forward to supporting the Council in its efforts to build a healthier, greener, and more resilient New York.

Respectfully submitted,

Arthur O. Klock Jr.

Arthur O. Klock Jr.
Director of Trade Education
Plumbers Local Union No.1
Trade Education Fund

EDF
ENVIRONMENTAL
DEFENSE ACTION FUND
Legislative arm of Environmental Defense Fund

April 2, 2014

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Dear Chair Williams,

Environmental Defense Fund (EDF) is a leading national nonprofit organization, headquartered in New York, representing over 700,000 members nationwide, and roughly 35,000 in New York City alone. Since 1967, EDF has linked science, economics, law, and innovative private-sector partnerships to create breakthrough solutions to the most serious environmental problems.

EDF enthusiastically supports the green building legislation on the Committee of Housing and Building's agenda today. We all spend most of every day inside New York City buildings, making the building code a crucial tool for ensuring the health and safety of New Yorkers.

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edactionfund.org

The building code also has a uniquely positive impact on carbon pollution and global warming. By 2030, green codes measures already implemented will reduce citywide carbon emissions by almost 5%, and lower daily water consumption by the equivalent of 30 Central Park Reservoirs. But codes requirement constant improvement to stay on the cutting edge and enable economic development in New York City.

The Council has a long tradition of city, state, and national leadership in green codes. The Committee is to be commended for taking up a serious slate of green bills early in its term. The current set of bills are worthy of close attention and quick passage, and we encourage the Council to continue its work on green codes beyond this bill package.

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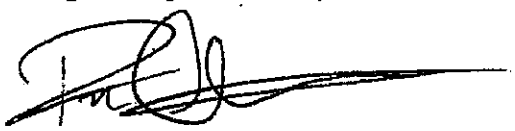
New Yorkers' health, especially children who are most susceptible to asthma and other respiratory issues, will be improved by making sure bathrooms and other wet areas do not grow mold (Int 93). The Council can encourage health through active design by making stairs more accessible and usable (Int 202 and 203). Since mold prevention and ensuring stairs are usable during a power outage are also key for building resiliency, these bills have renewed urgency since Sandy.

EDF, in coordination with the City of New York, manages the NYC Clean Heat program, which aims to reduce soot pollution from buildings by 50%. This involves assisting buildings currently burning No. 6 and No. 4 oil to transition to cleaner fuels, reducing particulate matter and harmful chemicals from the air New Yorkers breathe and improving building efficiency. The program is set to close in June 2014, when City funding ends.

The program has been very successful, a contributing factor in NYC having the cleanest air in over 50 years. EDF would like to use the NYC Clean Heat model for other building-related work in the city, such as helping buildings act on the recommendations they receive from energy audits mandated through LL 87 and LL 84. These services, which we are calling the Greener Greater Accelerator, would be structured similarly to the program model that is currently in place for NYC Clean Heat but with an increased emphasis on technical support, improving building energy efficiency and the quality of life for New Yorkers.

We look forward to supporting the Council in its efforts to build a healthier, greener, and more resilient New York.

Respectfully submitted,



Rory Christian
Director, New York Smart Power
Environmental Defense Action Fund

CENTER FOR ACTIVE DESIGN

APRIL 2ND, 2014

TESTIMONY IN SUPPORT OF T2014-0701 and T2014-0702

Submitted by:
Center for Active Design
David Burney, FAIA, Chair, Board of Directors

To: New York City Council Housing and Buildings Committee, Council Member Jumaane Williams, Chair

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Good morning, Chairperson Williams and members of the New York City Council. I am David Burney, Chair of the board for the Center for Active Design and immediate former Commissioner of the New York City Department of Design and Construction. Thank you for the opportunity to provide testimony regarding the two Introductions addressing the promotion of stair use to impact health in New York City.

The Center for Active Design (the "Center") is a non-profit organization that grew out of the city of New York's Obesity Task Force recommendations. Our mission is to reduce the risk of obesity and chronic diseases by promoting physical activity and healthy food access through the design of buildings, streets, and neighborhoods. We work to decrease rates of chronic disease among New Yorkers of all ages and abilities by translating health research into practical design solutions. Ultimately, we use architecture and urban planning solutions to improve public health and social equity for all neighborhoods in New York City.

Chronic diseases such as obesity, diabetes, and heart disease are the greatest health epidemics of our time and the effects on New York City are consequential. More than half, or 56% of NYC adults, and nearly 40% of public school children (K-8) are overweight or obese. Obesity and chronic disease rates disproportionately affect lower-income and minority neighborhoods. Black, Latino, and low-income communities have obesity rates that are sometimes much higher than the rest of the city. For example, in neighborhoods such as East New York, 63% of adults are overweight or obese,[1] which is much higher than other neighborhoods.

The costs of chronic diseases and obesity are extensive. In 2006, in New York State alone, insurers spent about $11.1 billion to address obesity, including $2.7 billion spent

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[1] New York City Department of Health and Mental Hygiene. Epiquery: NYC Interactive Health Data System Community Health Survey 2012. Viewed March 31, 2014. http://nyc.gov/health/epiquery.

by Medicare and $4 billion by Medicaid. This translates to about $2.7 billion in Medicaid expenses for NYC residents on obesity.[2] We are also now living in the first generation, where as a result of obesity, today's children may have a shorter life expectancy than their parents.[3]

Physical inactivity is one of the key risk factors for chronic disease, and was responsible for nearly one in ten preventable deaths in the U.S. in 2005.[4] In many cities, including New York City, physical inactivity has become the new normal. The costs and consequences of physical inactivity are passed down through generations, creating a cycle of poor physical and mental health. As work practices, domestic life, and transportation efforts require less physical activity, the primary opportunity for physical activity is in leisure and recreation. Data shows us that time spent being physically active in leisure activities is not enough to remain in good health.

Regular stair use increases physical activity and according to ample health research, is associated with numerous health benefits.[5] Stair use helps burn calories and assists in weight management. In fact, research shows that just two minutes of stair climbing per day can burn enough calories to prevent the average annual weight gain of U.S. adults.[6] It is an effective form of incidental physical activity, which can easily be incorporated into the daily lives of most able-bodies individuals.

Legislative Bills TS2014-0701 and TS2014-0702 offer substantial public health benefits with relatively low levels of associated cost. The bills seek to promote stair use by allowing access of a building's stairway to the building's occupants. They further seek to encourage routine stair use by increasing visibility of a building's stair and making it easier to find.

In many New York City buildings, stairways are often locked on the stair side of the door, preventing occupants from using the stairs. Because the option does not exist to use the stairs, occupants resort to using the elevator, even to go a couple of floors. Further, stairways are often relegated to the back of buildings, where they are difficult to locate. Also, lack of visibility of the stairs impedes their use as building occupants are often unsure which door leads to the stairs.

The proposed Public Access Stairway will remedy this situation by increasing access, and visibility of a building's stairs, while still allowing for the building owner to properly take security concerns into account through the use of key card devices. Incorporating glass into stairwell doors makes current opaque doors easier to locate and stairwells more inviting to use.

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[2] The City of New York. Obesity Task Force Report. May 31, 2012. Viewed April 1, 2014. http://www.nyc.gov/html/om/pdf/2012/otf_report.pdf.

[3] Olshansky SJ1, Passaro DJ, Hershow RC, Layden J, Carnes BA, Brody J, Hayflick L, Butler RN, Allison DB, Ludwig DS.A potential decline in life expectancy in the United States in the 21st century. N Engl J Med. 2005 Mar 17;352(11):1138-45.

[4] Danaei G, Ding EL, Mozaffarian D, Taylor B, Rehm J, Murray CJL, et al. The preventable causes of death in the United States: Comparative risk assessment of dietary, lifestyle, and metabolic risk factors. PLoS Med 2009: 6(4).

5 Lee IM, Paffenbarger RS, Jr. Physical activity and stroke incidence: The Harvard alumni health study. Stroke. 1998;29:2049-54

6 Zimring C, Joseph A, Nicoll GL, Tsepas S. Influences of building design and site design on physical activity: research and intervention opportunities. Am J Prev Med. 2005;28:186-93.

Including a Public Access Stairway, and its components of glazing and stair prompt signage is feasible. We have seen numerous examples, both in public city buildings and within the private sector, where access to the stairs, glazing in stair doors, and stair prompt signage was implemented. When I was Commissioner at the Department of Design and Construction, we worked to unlock stair doors and provide routine access to at least one stairway in each city building. Study results analyzed by the Health Department and published in the American Journal of Preventive Medicine show that stair prompt signage was associated with a 3.21 increase in the likelihood of individuals using the stairs.[7]

In the private sector, developer Les Bluestone from Blue Sea Development Company has incorporated the components of a Public Access Stairway in his affordable housing project, Arbor House. Located in the South Bronx, Arbor House provides 124 units of affordable housing to local families in need. In order to truly make Arbor House a health-promoting building, Mr. Bluestone positioned the stair entry point adjacent to the elevator in the main entrance lobby, providing equal access to both options. He further incorporated glazing within 50% of each stair door, increasing visibility into the stairway. Finally, he posted stair prompt signage on each floor, enticing people to use the stairs rather than the elevator. Mr. Bluestone found the integration of these health-promoting stair items useful and feasible in terms of cost and design, which he has explained in his written testimony that has also been presented to the Council. As a final note on cost, the Green Codes Task Force reports cost estimates related to the bills incur less than a .02% increase in capital costs – a minimal amount when considering the associated health benefits.

Legislative Bills TS2014-0701 and TS2014-0702 offer a number of co-benefits, having positive effects on safety and environmental sustainability. Increasing knowledge of stair location through improved stairwell accessibility and visibility can improve familiarity with emergency and fire safety protocols. Stair use can also provide a building with environmental and economic benefits. Elevators generally account for 3-5% of a building's energy use[8], and a 20 horsepower escalator operating 24 hours a day, 7 days a week generates roughly 43,000 pounds of CO2 per year.[9] Certainly promoting stair over elevator and escalator use can stave off some of these fossil fuels being expended into the atmosphere.

Increasing access to a building's stairway and encouraging its use are critical steps that we can take to improve the health of New Yorkers. This City is recognized worldwide in promoting innovative methods to improve public health, but we still have a long way to go in preventing chronic diseases amongst New Yorkers of all ages. These bills will help to ensure that we promote an option for increased physical activity through a space that most New Yorkers encounter in a typical day – the stairs.

Thank you, I am happy to answer any questions.

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[7] Ruff, et al. Associations between building design, point-of-decision stair prompts, and stair use in urban worksites. Am J Prev Med. 2014; 60: 60-64.
[8] U.S. Department of Energy. (2001). Greening Federal Facilities An Energy, Environmental, and Economic Resource Guide for Federal Facility Managers and Designers.
[9] Toledo C. Reduce greenhouse-gas emissions with vertical transportation equipment. Buildings. 2007 June.

Testimony of Laurie Kerr, NRDC
NYC City Council Committee on Housing and Buildings Hearing
April 2, 1014

Chair Williams and Members of the Committee on Housing and Buildings,

I am delighted to be testifying today in favor of the slate of green codes ordinances that are being heard today. My name is Laurie Kerr, and I work for the Natural Resources Defense Council, where I am the Director of the City Energy Project; I am also a licensed architect in the State of New York. Full disclosure: I also participated in the development of many of these code provisions in my former role as Deputy Director of the NYC Mayor's Office of Long Term Planning and Sustainability.

Before addressing the particular bills that are before the committee today, I want to touch on the importance of NYC's leadership from a national perspective. Currently cities are seen as the caldron of change in America – the place where the very best ideas are being generated. This is particularly true of New York, the nation's largest city, which has led the charge on policies promoting public health and a better environment. In fact, energy efficiency policies that New York and a few other cities developed and piloted are now viewed as so beneficial that they are being tailored to ten other American cities – including Los Angeles, Chicago, Houston, and Atlanta -- in the project the that I now direct. And cities internationally are also studying these policies. Now that's impact! And if we are to heed the warnings that came out yesterday from the International Panel on Climate Change, impact is what we'll need if we want to protect the citizens of this city and other cities from the catastrophic effects of climate change.

Still – Are these eleven code proposals good for New Yorkers now? I think that they are. They fall into three main categories, with the exception of Intro 181, related to hotels, which I will not comment on.

Three of the proposals will improve public health. Intro 93 will help reduce mold in bathrooms and other damp places – and mold exacerbates the asthma which afflicts so many New Yorkers, especially lower income New Yorkers. Intro's 701 and 702 will help reverse the obesity epidemic, which seriously threatens the long-term health of so many New Yorkers. Making it easier for people to use the stairs is a simple, common-sense idea, since integrating movement into everyday activities is the best way to keep people exercising.

Six of the proposals will improve the energy efficiency of New York's buildings, which are responsible for almost ¾ of New York's carbon emissions. I'm only going to discuss a few of these, but together these proposals will go a long way toward reducing the energy wasted in buildings that result in air and carbon pollution and increase our cost of living. Two of the proposals – Intros 13 and 245 – will ensure that our buildings are running properly – surely the first thing that should happen. Intro 13 would do this by ensuring that building operators are trained in the energy systems they control, and Intro 245 would ensure that buildings have been tuned to run properly at the time they are built. Intro 13 will also add a career path for the many New Yorkers who operate buildings; by knowing how to run energy systems in a way that saves buildings money, they will become more valuable in the market place. Finally, I want to mention Intro 695, which will ensure that our building facades are built to keep the heating and cooling – for which we pay so dearly – from rapidly leaking out. This law would put common sense requirements on facades – that they not have too many leaky holes for air conditioning equipment and that they not have exposed floor slabs that drain much of the heating and cooling from New York apartments.

Finally, one proposal, Intro 794, would protect the street trees that make New York streets so pleasant to look at and provide much needed shading and cooling in the summer. These street trees are constantly endangered by the sidewalk sheds that are erected every 5 years to protect our facades. (Apparently there are enough of these sidewalk sheds to go from here to Baltimore!) But it doesn't need to be this way – we can have safe facades and healthy trees if we just take reasonable precautions to protect the trees.

While I am generally very much in favor of the proposals before you, I have a few proposals for improvements. The initial proposal on street trees needs to be stronger and clearer: the initial language from the Green Codes Task Force had very specific requirements which are missing from the current version. I would urge the Council to return to the earlier version. Intro 553 on construction site lighting has omitted the requirement that all but the safety lights be turned off when workers have left the site. This requirement should be included to save energy and so that New Yorkers can sleep at night. Finally, Intro 0013, regarding certification of building operators, has what appears to be an over-ambitious timeline. The current timeline would give operators only two years to comply, whereas four or five years would seem to be more reasonable, given the large number of building operators. Perhaps this could be phased in according to building size.

Thank you very much for the opportunity to testify today.

urban green

Testimony for Russell Unger
Executive Director, Urban Green Council

New York City Council Committee on Housing and Buildings

April 2, 2014

Good morning Chair Williams and Committee Members. My name is Russell Unger and I am the Executive Director of Urban Green Council and served as chair of the NYC Green Codes Task Force. With me today is Cecil Scheib, Chief Program Officer of Urban Green. We are here to testify in support of the bills being heard, which would implement recommendations of the Task Force.

My comments will highlight some of the bills, but I will mostly spend my time talking about the importance of the Council's longstanding leadership on green codes.

When folks like us think about people's health, clean air, environmental justice, and economic development, we think of building codes. That leaves other people scratching their heads.

The building code is central to these issues because New York is a city of buildings. And we spend almost all our time, whether at work, home, or school, inside a building.

Buildings codes are the DNA of buildings. They control what new buildings arise and how existing ones grow and change. So:

- If you want healthier New Yorkers, make stairwells more accessible and attractive to use, so those who want to take the stairs can do so.
- If you want to reduce asthma in kids, make sure boilers aren't oversized and run efficiently so they aren't releasing lots of soot. Make sure drywall in bathrooms and basements is mold resistant.
- And if you want buildings to reduce pollution, help stop global warming, while growing the green jobs sector in New York, require energy efficiency training for building operators in large buildings.

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All those solutions are in the bills before this committee. If you want to have a city 20 years from now where no child has to bathe in a moldy bathroom, and the air is clear, it starts today with codes.

As you will hear from other speakers, there is an extremely broad constituency and industry cooperation in advancing green codes. Interests as varied as real estate owners, unions, architects, and environmental justice groups all support this agenda. Many will testify. We have provided support letters from those who could not attend, including UA Plumbers Local 1, Heat & Frost Insulators Local 12, WE-ACT for Environmental Justice, ASHRAE-NY, and Environmental Defense.

The Council has passed many green codes before, but today's bills are a special batch – both because of the number of codes being passed and how prominent some of them are. Stopping mold is long overdue and the effects of Sandy have shown how important clean air is inside our homes. And energy efficiency training for building operators is an incredible opportunity to invest in the men and women who are keeping buildings working across the city, a small investment that will pay large dividends for years to come.

We still have some suggestions for improvements along with the ideas you'll hear today. But we stand with city government and industry in overall overwhelming support, and just a few caveats on details.

We commend the Chair and Committee for moving on green codes early in the term. We remain eager to assist the Council in any way we can help. You may ask either of us about broad policy implications, and my colleague Cecil Scheib about technical questions. Thank you.

Council of New York Cooperatives & Condominiums
INFORMATION, EDUCATION AND ADVOCACY

250 West 57 Street • Suite 730 • New York, NY 10107-0700

TESTIMONY COMMENTING ON INT. 13 WHICH REQUIRES
THAT THE BASE BUILDING SYSTEMS OF CERTAIN BUILDINGS
BE OPERATED BY INDIVIDUALS WITH A CERTIFICATE
IN BUILDING ENERGY EFFICIENCY FROM AN APPROVED PROGRAM
Wednesday, April 2, 2014

Good morning Chairman Williams and members of the Committee. My name is Mary Ann Rothman, and I am the Executive Director of the Council of New York Cooperatives & Condominiums (CNYC).. More than 170,000 New York families make their homes in our member cooperatives and condominiums. Like all New Yorkers, we want the best possible quality of life in our homes and in our city. But we are also mindful of the cost in time and stress and dollars that legislation and regulations can impose on our members. We have some comments and questions on Int. 13.

Our understanding is that this legislation requires that the Superintendent or Handy Person in a building of more that 50,000 square feet (other than those buildings that opted to implement 6 of the 7 most typical energy savings measures outlined in Local Law 87 of 2009) must become certified in energy efficiency by passing a written test appropriate to the nature of their building and that this certification must be renewed every three years. The approved institutions training and testing these individuals must issue a separate identification code or number to each certificate holder and must maintain records of the certificate holders and any recertification requirements that will be promulgated. Buildings must post their certificates and must certify compliance at least once every three years.

These requirements are clearly designed to enhance the operation of larger buildings in New York City and to increase their energy efficiency. But many residential buildings of 50,000 square feet – particularly those that are the homes of families of modest means -- are small enough and simple enough that they have just one employee, the building Superintendent. In these situations, imposing the requirements of Int. 13 is impractical and

Please turn the page.

unnecessary. We believe that the threshold for compliance with this certification requirement should be revised, and that free training should be provided by the city for those Supers who do not have training readily available. We would also respectfully suggest that the recertification requirement should be at 5 year intervals or greater.

Building whose employees are members of Local 32BJ of the Service Employees International Union, do have appropriate training available through the Green Super Program at the Thomas Shortman Training Center. This in-depth 40 hour program should more than meet the certification requirements of Int. 13, which means than 2,000 building Supers throughout the city are already prepared to do well on the certification tests. Their employers have provided release time for them to take this class. The New York City College of Technology also provides training in building systems and could devise a similar program, where cost to employers should not be excessive or where City support might be appropriate. We would strongly urge that both of these institutions be included in the list of qualified programs; their existence helps make the 2015 implementation date for this legislation feasible.

As always, CNYC will look forward to the details in the regulations that will be established to implement this law. We will have comments to offer if they significantly increase costs for our members.

Thank you for this opportunity to comment.

REBNY®
REAL ESTATE BOARD OF NEW YORK

Testimony before the Committee on Housing and Buildings
of the New York City Council
By Angela Sung Pinsky
Senior Vice President, Management Services and Government Affairs
Real Estate Board of New York
April 2, 2014

Good morning Chairperson Williams and members of the Committee on Housing and Buildings. The Real Estate Board of New York, representing over 15,000 owners, developers, managers, and brokers of real property in New York City, thanks you for the opportunity to testify regarding the many proposed changes to the Administrative Code and Construction Codes. We also appreciate that the New York City Council has been proactive in seeking our comments and in collaborating with building owners.

For many of these bills, we support the intent and the goals of the proposals. We have worked diligently with the Mayor's Office of Long-Term Planning and the Department of Buildings on these in the past, who dedicated many hours to hearing, discussing, and addressing our specific concerns. These discussions were very productive; however, REBNY does not believe that these bills reflect all of the progress made in conversations. Given the number of bills on the agenda, we have prepared a detailed list of comments in the attached appendix. We will only highlight some of our outstanding concerns now, such as:

Int 0013-2014 – EO3 – Training Building Operators in Energy Efficiency

- We believe the current legislation is far too vague and greater specificity about the program is needed in the legislation, such as the necessary number of hours of education, program costs, and the process of approving new training programs
- We are also concerned about the proposal's impact on those currently working whose ability to complete training is impaired, such as non-English speaking workers, and operators with varying levels of classroom literacy.

Int 0014-2014 – EE2 – Improve Heating and Cooling Load Estimates

- The room by room estimate would be extremely onerous for both the design community and the DOB with little benefit at the planning submission stage, as heating and cooling loads are largely determined by use, not by room sizes, and can change over time.
- The goals of the requirements are redundant with the State Energy Code that will be adopted shortly, which already prohibits the capacity of such equipment from exceeding the loads calculated.

Int 0181-2014 – Community board review of hotel development plans

- This bill is counter to the foundation of NYC's Zoning: as-of-right construction; mandating community board reviews would undermine the City's ability to grow organically and flexibly
- Hotel development is key to growing tourism, which is one of the City's most important growth sectors and job creators; the proposal would further complicate the already difficult process of meeting demand.
- The bill may delay developments indefinitely by withholding certifications.

T2014-0695 – EF3 – Limiting Heat Loss through External Walls

- The specified U-Factor would prohibit PTAC units in favor of more costly central HVAC systems, which would propose a disproportionate cost burden for affordable housing and lower density development.

T2014-0701 – HT15,16,17 – Public Access Stairways

- The proposed changes are substantial and would circumvent much of the work and process of the triennial Building Code review regarding access.
- It is unclear how buildings could address security risks related to instances of multi-floor tenants with only one receiving area.
- The door glazing and sidelight requirements may be prohibitively expensive given their design implications.

T2014-0702 – HT18 – Hold Open Devices for Doors

- The proposal would diminish buildings' energy efficiency and fire protection by increasing the stack effect and interrupting fire proofing.

T2014-0245 – EE25 – System Commissioning

- The bill would be duplicative once the NYS Energy Code is adopted for use in NYC and many of the proposed requirements are already covered in Energy Code Progress Inspections.
- Because much of the commissioning information is about measuring performance and not design, mandating a commissioning report prior to TCO will either limit the value of the reports, or lead to substantial delays and costs.

T2014-0794 – UE5 – Protect Street Trees

- The bill should only apply to work with a likelihood of causing damage to trees, such as demolitions, not any street work within 10 feet.
- Due to the fluctuations in Parks budgets and subsequently staffing and delays in other parks permitting areas, tree protection plans should not be required to pull permits.

Again, due to the volume of the bills and the severity of our concerns, we have provided more detail in the attached appendix. We request that further consideration with all relevant stakeholders be given to all of the aforementioned proposals for further input and refinement.

Thank you again for the opportunity to comment. We look forward to continuing our conversation with the Council to improve the built environment of the City for all New Yorkers.

Appendix – Further Detail

Int 0013-2014 – EO3 – Training Building Operators in Energy Efficiency

1. This bill is leaving far too many details unaddressed and defers far too much rule making. The bill should outline – at a minimum: Hours of required education, level of education, requirements of training, costs of training, goals of the training, the criteria for approval of training programs, the structure/mechanism for training programs to be approved, any fees or violations associated with this program, and other significant details.
2. Given that there are 13,500 covered buildings that will have to comply with this program, the city should make the requirement contingent on city's ability to identify and approve a critical mass of program that can handle the volume of required attendees within a reasonable timeframe.
3. This bill has the potential to displace current viable and effective employees that may not be able to meet the training requirements due to limited English proficiency, potential issues with having to register with a public agency, ability to cover the costs of training, ability to access a training center, and other critical operational issues
4. Residential buildings are much more varied in their employment structures, staff demographics, geographic and economic distributions, and abilities to comply with complex regulations. We suggest that for a program this substantial, the city first address the requirements for commercial buildings and then determining the residential program after evaluating the success of the commercial program.
5. There is no clear data that buildings are not being operated efficiently now, and the city has yet to define the quantifiable benefit to this very burdensome and extensive requirement.
6. This program will have a disproportionate strain on affordable housing, which is often operating on fixed incomes and limited margins, and the building tenants do not have an ability to contribute to the increased operating costs of the building.

Int 0014-2014 – EE2 – Improve Heating and Cooling Load Estimates

1. The requirements for this bill are far too onerous on both the design engineer and on DOB. Heating and cooling loads are largely determined by use, and not by room sizes, and therefore are subject to change over time.
    a. For example: a floor for office space will consume substantially less than a trading floor, or a storage room vs. a server room.
2. Room by room analysis – in commercial buildings, the rooms are determined as part of tenant fit out and potentially might not be available at the time of a building application.
3. Equipment for buildings is sized for potential need and growth, not for a static momentary condition. For any building of significant size, these calculations and discussions are happening. If anything, this should be restricted to single family homes.
4. The proposed requirements would be redundant. NYC Construction Codes already require that engineers perform load calculations in accordance with ASHRAE procedures, and the NYC Energy Code already prohibits the capacity of such equipment from exceeding the loads calculated.

5. Requiring load calculations to be included on the drawings for every room in a building would result in enormous submission packages and huge delays in plan reviews; without any guarantee of benefit.
6. We are also concerned that DOB does not have the expertise necessary to adequately evaluate engineering load calculations given the need for firsthand experience with the machinery. This bill will likely lead to a large amount of costly litigation given the ease with which calculation results can be shown to vary from the actual operating results.
7. We do not agree with the premise of this bill—that heating and cooling equipment is often oversized and that it is common for designers to guess when calculating loads—and believe the requirements go beyond the bill's intent.

Int 0016-2014 – EE19 – Insulate Existing Pipes Exposed During Alterations

1. There are not quantifiable benefits associated with this bill.

Int 0093-2014 – HT7 – Reduce Mold In Moisture-Prone Locations

1. The following areas may not necessarily be more prone to water damage than other areas and should be exempt:
    a. Basements (in building snot located in flood zones)
    b. ceilings beneath air handlers (since the mechanical code now requires both a secondary drain pan and leak detection that shuts off the unit)
    c. walls of plumbing chases (if proper practice is follows, there is minimal additional risk of the walls of a shaft or chase becoming wet)

Int 0181-2014 – Community board review of hotel development plans

1. Our City's growth and prosperity have been due in large part to our as of right development policies. We developed what is arguably the most comprehensive Zoning Resolution of any major city in the country to control the size, location, and uses of new development within an as of right framework. The proposed mandatory community board review undermines this vital aspect of New York City, impeding growth and adding new hurdles to development.
2. NYC tourism has been on a boom for the last decade, the development of new hotels follows the resulting demand. Given that demand is unlikely to subside in the near future, the delays in construction created by the proposal will only hurt NYC.
3. The bill seems to grant Community Boards the ability to indefinitely delay projects by failing to certify that the plan has had a hearing or has been submitted. Given how adequately our Zoning Resolution deals with the siting and designing of buildings, it is unclear what benefit would come from adding this step to as of right development. Communities should seek to affect the planning process if they believe hotel uses to be inappropriate for their neighborhoods.

T2014-0695 – EF3 – Limiting Heat Loss through External Walls

1. This bill penalizes the use of Packaged Thermal Air Conditioning (PTAC) units which are primarily used in more affordable housing developments and lower density developments. By specifying an arbitrary value for the U-Factor to be used for PTAC units, this bill will have the effect of

prohibiting the use of these units, and will force the use of full building central HVAC systems, which could significantly increase the costs of affordable housing construction.

2. In previous discussions, DOB and OLTPS agreed that the proposed U-Factor of 0.5 BTU/hr-ft^2-F appears excessive and was going to determine new values or criteria to measure heat loss using a more rigorous basis.

T2014-0701 – HT15,16,17 – Public Access Stairways

1. Procedural: In the process of creating the 2008 Building Code and in the recently enacted 2013 code revision, hundreds of professionals spent hundreds of hours making the Code consistent with their relevant national, I-Codes codes, in what was a consensus based approach, implemented through technical management and advisory committees. Committees spent many hours discussing issues that had much less impact than the changes proposed in this bill. The procedure in which this change to the Building Code is being introduced appears to circumvent this entire process;
2. Format: Some of the stated goals of the 2008 Building Code and the 2013 Building Code revisions were to make these codes consistent with national model codes (I-codes) and to clarify the codes so to eliminate confusing language. This Local Law introduces new language, a "public access stairway", which is inconsistent with language used in other model codes and is confusing as to how this relates to means of egress, exit enclosures, egress stairs, etc.
3. Technical:
   - Under proposed section 1008.1.9.10.4.1 and 1008.1.9.10.4.2, it is unclear as to whether the conditions listed (11.1-1.5 and 2.1-2.3) are all required to be met or if just of one the proposed conditions are to be met.
   - Under Section 1008.1.11 Glazing in doors, the amount of fire-protection glazing required in the stairway doors seems excessive (10 square feet for entrance level doors and 7 square feet for other doors). This appears to contradict size limits of glazing indicated in Section 715.4.7.1; would require non-temperature rise doors to achieve sizes and required fire ratings. Further doors with this amount of fire-protection rating glazing would need to be custom-design and independent testing to ensure required fire ratings are met. This could also increase the weight of the door.
   - Section 1009.15.1 Entry location – The requirement for direct access to a public access stairway where the common entrance area at building entrance level provides direct access to an elevator the may be in conflict with section 1023 Exit Discharge and Section 1024 Assembly which encourage discharge of stairs directly to the exterior. There is no clear definition of "direct access" is; is there a distance requirement, can it be through a corridor, etc. The requirements of Section 1009.15.3 Multiple occupancies, further complicates these issues
   - The sidelight requirement is onerous, given that many new buildings are using concrete stair enclosures for impact resistance, and installing sidelights of 7+ square feet in a concrete wall would be difficult and expensive.
   - The intro seems to have contradictory provisions between 403.5.3 and 1008.1.9.10.
   - It is unclear how a building is expected to comply with and maintain appropriate security for tenants from other tenants in the building and outside visitors, particularly for multi-floor tenants where only one floor has a receiving area.

T2014-0702 – HT18 – Hold Open Devices for Doors

1. The requirement to hold open doors will increase the stack effect of the building, where air is driven through the building by vertical pressure differences, and will need to be compensated by increased forced ventilation, which will have a substantial increase in a building's energy consumption and carbon emissions.
2. This requirement will also diminish a building's fire protection by holding open doors that were intended to be fire proofed.
3. It is unclear how a building is expected to comply with and maintain appropriate security for tenants from other tenants in the building and outside visitors, particularly for multi-floor tenants where only one floor has a receiving area.

T2014-0245 – EE25 – System Commissioning

1. There are already commissioning requirements within the new energy code, which is pending adoption by NYS. This requirement should be deferred until the State energy code is adopted for use in New York City.
2. Energy Code Progress Inspections already cover many of the requirements noted herein
3. It appears that the draft local law requires the preliminary commissioning report prior to the mechanical TR1 inspection and consequently a TCO. Attempting to mandate commissioning as a prerequisite to TCO will either produce a report with no relevance or value or will create delays of TCOs and will incur substantial costs.
4. While the draft describes deferral of tests due to climatic conditions, it fails to acknowledge the most relevant reasons that commissioning report is premature prior to TCO. For example:
    a. In-season testing of energy consuming systems is not relevant without the design intended building operation and occupancy, which is only possible after TCO
    b. The reality is that not all equipment and systems are complete (nor necessary to be complete) for TCO. For example, completion and operation of thermal storage systems has anecdotally not been a requirement of TCO. Therefore not only can the thermal storage system not be commissioned, but its associated systems of chilled water pumping, condenser water pumping/towers, plant controls, etc likewise cannot be functionally tested as a design intended integrated system. Like this, the majority of systems would need to be deferred as simply "Not Complete" in a 'Preliminary Commission Report" prior to TCO.
5. Sections C408.2.2 and C408.2.5.3 describe system balancing, but do not reference requirements of Commissioning Local Law.
    a. Balancing should not be a sub-contract to commissioning. There is no definitive benefit to balancing and it shouldn't be mandated in law.
    b. Commissioning as a redundant balancing program simply adds to developer costs with no benefit.
    c. It should be clarified if the intent for the commissioning is to verify the balancing was done

T2014-0553 – EE16 – Construction Site Lighting

1. No issue with efficacy requirements, as they are in line with current practice of using compact fluorescents and Metal Halides
2. The master switch requirement is not practical based on how temporary lighting is installed and maintained. Requiring that all lights be operable from within 20 feet of the site entrance would increase the cost of temporary lighting by 25-30%, and the savings in energy would be quite small.

T2014-0794 – UE5 – Protect Street Trees

1. The Statement of purpose indicated that the bill is to protect street trees from sidewalk sheds. However, the bill text indicates that any construction or work on a street within 10 feet of a street tree would need to follow this rule. This lack of specificity could include minor work that would have no effect on street trees including filling potholes, repairing a building door, placing signage.
    a. The bill should be restricted to work that has a likelihood of causing damage to the tree, which should be limited to demotion work where the work is immediately adjacent to the tree
2. The Statement of purpose indicates that street trees can be damaged by shade from the sidewalk shed.
    a. These sheds are designed to meet safety specifications and to protect the public. The parks department should not have the ability to require any varied construction of these structures to meet the requirements of the tree protection plans
3. The tree protection plan should not be required to pull permits. The parks operating budget is subject to city cuts more substantially than other agencies. Permits regarding street trees and builders pavement plans have and continue to be substantial, which would be extremely damaging for construction if it can hold up building permits (For example: The pruning cycle is now every 20 years (it used to be every 7 years) because of budget cuts)
4. The criteria for the tree protection plan can have significant impacts on construction and at a minimum the principals/guidelines/limitations on scope that will govern the protection plan should be included in the legislation and not left entirely up to rule.

Enterprise®

For The Record

April 2, 2014

Honorable Jumaane Williams, Chair
Committee on Housing and Buildings
New York City Council
City Hall
New York, NY 10007

Re: **Comments in support of Int. No. 13, 14, 16, 93, 184, 202, and Preconsidered Int. on Construction Site Lighting, Protecting Street Trees, and Building System Commissioning**

Dear Chairman Williams,

On behalf of Enterprise Community Partners, Inc., I submit this letter in support of the proposed intros that deliver health benefits to residents and cost savings to owners by updating the building and administrative codes of the city.

At Enterprise, we have worked with the city and with community-based organizations to create opportunity for low- and moderate-income people through affordable housing for more than 26 years. In that time, we have created or preserved more than 44,000 affordable homes for 114,000 residents and committed $2.5 billion in equity, grants, and loans to community development projects.

Since 2010, Enterprise has supported the city's Green Policy for affordable housing by providing third-party certification under the Enterprise Green Communities Initiative for each new construction and substantial rehab project funded by the city. The Enterprise Green Communities Criteria continues to be leading national standard for green and healthy affordable housing, adopted by more than 20 states. From 2010-2012, Enterprise, together with LISC and the city's Department of Housing Preservation and Development, performed energy efficiency improvements for 2,200 affordable homes in the city's asset management portfolio. Several of the measures that would be required by the intros under consideration were implemented as part of that program and continue to benefit low-income residents today. Together, we've worked to prove that it is possible to bring the health, economic, and environmental benefits of green building to low-income communities, and we believe that this experience has already proven the many benefits of the changes proposed in these intros.

We applaud the Council's continued to work to make New York's buildings more healthy and energy efficient, and we offer the following specific comments:

Int 13: Training Building Operators in Energy Efficiency

We strongly support this bill to ensure that building operators are trained and certified to operate their equipment efficiently. Technical service providers, including our own staff, have seen firsthand the energy waste resulting from inaccurate or outdated information, and lack of familiarity with best practices. As part of the city's Green Policy for affordable housing, developers are already required to provide at minimum, an operator orientation for all building systems. Training that goes above and beyond this minimum would make this existing policy more effective. A superintendant trained in basics of building energy can make significant improvements in a building's energy consumption. In our direct experience through the PartnerPREP program, an energy efficiency retrofit and training program for affordable housing organizations, operations and maintenance improvements can yield 25% savings or more – and our findings are consistent with other research. Additionally, many affordable housing building operations staff are themselves residents of the communities in which we work. This training meets the dual purpose of energy efficiency and enhancing workforce capacity.

Int 14: Improving Heating and Cooling Load Estimates at Time of System Design

This proposed legislation will make sure that mechanical systems in buildings are big enough to get the job done, but aren't so big that they waste energy or create indoor environments that are too hot or too cold. Right-sized systems mean lower operating costs and better financial outlook for affordable housing, and more comfortable indoor environments for residents. In our experience, oversized heating and cooling systems are the rule rather than the exception. These unnecessarily large systems are also often more expensive to begin with. Proper sizing of heating and cooling systems delivers significant benefits at no additional development cost, and is a well-established professional best practice that New Yorkers deserve to benefit from.

Int 16: Requiring Insulation of Existing Concealed Pipes Exposed During Alterations or Repair

We encourage the adoption of this proposed code change to reduce energy use and improve resident comfort by ensuring that pipes are insulated during alterations or repairs. For affordable housing projects funded by the city, it is already a requirement and common practice to insulate pipes during new construction or substantial rehabilitation. This requirement would help make sure that existing buildings also benefit from this best practice any time there is the opportunity to do so.

Int 93: Requiring the Use of Mold-Resistant Gypsum Board and Cement Board in Moisture-Prone Locations

This bill would improve resident health by reducing mold that can trigger asthma attacks and other respiratory conditions. The use of mold-resistant gypsum and cement board is already standard practice in the city's affordable housing developments because it is required in the

city's Green Policy, based on the Enterprise Green Communities Criteria, adopted in 2010. The many New York City affordable housing projects that used the Enterprise Green Communities Criteria voluntarily before 2010 were also required to follow this industry best practice. In our experience, it is an uncontroversial measure that delivers health benefits at nominal incremental cost to projects.

Int 184: Limiting Heat Loss Through Exterior Walls

We strongly support this bill because it would close a significant gap in regulations by eliminating thermal bridges in buildings. This bill would strengthen the city's Energy Conservation code by addressing common sites of building heat loss, thus reducing energy use in perpetuity. This measure makes sense also from the standpoint of making residential buildings more resilient. As the recent report "Baby It's Cold Inside" sponsored by the Urban Green Council shows, when a building's systems are unavailable because of a electrical or gas system disruption, the ability for that building to safely shelter residents at habitable temperatures depends entirely on the performance of the building's envelope.

Int 202: Improving Access to Stairs

This bill would encourage stair use by requiring stair doors to be unlocked, where this does not present a threat to safety, and signs promoting stair use. We believe this could improve resident health by promoting physical activity through the use of stairs and help combat the myriad health problems that arise from insufficient exercise. This measure would also help to make residents safer during crises -- when residents use stairs daily, it also means that they know where the egress points are should there be a need to evacuate the building.

Preconsidered Int: Protecting Street Trees

Trees provide environmental benefits including reducing the "heat-island" effect and providing cleaner air in urban environments. We strongly support this bill that would help preserve existing trees from damage during construction, thus protecting the city's and property owners' substantial investment in our natural infrastructure.

Preconsidered Int: Construction Site Lighting

We support this legislation that would require temporary light fixtures to meet similar energy efficiency standards as permanent fixtures. The high efficacy lamps specified in this proposed legislation use 65 to 75 percent less energy than incandescent lamps to provide the same amount of light and can last up to 10 times longer. If these lights were also properly shielded so that they directed light down where it's needed to light pathways, they would also improve pedestrian comfort and traffic safety by reducing glare without compromising the efficacy of lighting. We recommend that additional language addressing shielding be considered.

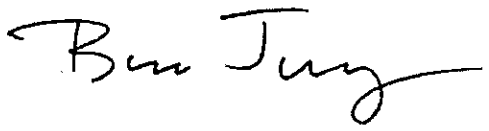
Preconsidered Int: Building System Commissioning

New building commissioning is a cost-effective strategy for reducing energy use, operation and maintenance costs, and greenhouse gas emissions. Many building owners already undertake this process to ensure that the systems they have purchased function as designed, but the practice is far from universal. We urge the City Council to help ensure that all buildings undergo this process.

In conclusion, we strongly support the proposed green building codes presented today. We thank the New York City Council Committee on Housing and Buildings for its work to ensure our city's buildings are more efficient and healthy for their residents. We look forward to working with you to continue bringing the environmental, health, and economic benefits of green building to low- and moderate-income communities, and all New Yorkers.

Thank you for the opportunity to share our experience with you.

Sincerely,



Bomee Jung
Deputy Director and interim head of the New York office
Enterprise Community Partners, Inc.
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212-284-7195

FOR THE RECORD

Queens & Bronx Building Association and the Building Industry Association of New York City

While we appreciate the intent of Int. No. 181, we feel that we must oppose the bill because it sets a bad precedent. Generally speaking, if a project conforms with zoning and the building code, there should not be additional steps to hinder the timing of such development. If there are objections to the placement of projects (whether hotels or not), then the best answer is to amend the zoning resolution. Moreover, if someone actually objects to the scope of a project and may feel it is not compliant with zoning, the Department of Buildings already has a process that allows for the challenge of such project. Thus, we see no purpose served by having a non-binding hearing that simply delays the commencement of a project.

Thank you for the opportunity to comment.

Regards,
Robert Altman

FOR THE RECORD

HOTEL ASSOCIATION OF NEW YORK CITY, INC.

320 PARK AVENUE, NEW YORK, NY 10022-6838
(212) 754-6700 FAX (212) 754-0243

FOR THE RECORD

NYC COUNCIL

Committee on Housing and Buildings

April 2, 2014

MEMORANDUM IN OPPOSITION

On behalf of the Hotel Association of New York City ("HANYC") thank you Chair Williams and the Members of the Committee for the opportunity to submit comments in regards to Int. 181. HANYC represents over 270 of our City's finest hotels which account for over 75,000 rooms, employing over 35,000 workers.

Int. 181 proposes to amend the City Charter and Administrative Code to mandate the review of any development of a hotel within the five boroughs, even if the hotel proposal is an as-of-right project. In addition, the application for construction of the hotel will have to include a certification that the appropriate Community Board completed a review of the hotel plan.

The Hotel Association is opposed to Int. 181. Int. 181 will create another burdensome step in the long process of building development in our City. For those hotels that can be constructed as-of-right, elected and community leaders have already determined that the particular district is suited for hotel use and each project is subject to the oversight of the Department of Buildings, other City agencies, and local elected officials and community leaders. For those hotel development proposals that must go through the City's ULURP process, this proposal is just another extra, unnecessary step in an already thorough and rigorous process that a developer must undertake, with numerous formal opportunities for members of the community to give input to both elected officials and the Community Board which has an important role in this process.

We believe this proposal will stifle the development process of modest hotel chains, which we are seeing in places like Long Island City, Harlem, Downtown Brooklyn, Staten Island and the soon to open hotel in the East Bronx. These hotels provide for increased tourism, good jobs and safe lodging for our guests. These hotels make visiting New York City affordable for many throughout the world and increase tourism in the great neighborhoods of our outerboroughs. All of our member hotels provide good wages and benefits to employees and their families. In addition, each hotel is fully regulated in terms of fire and building safety, keeping guests out of lodging options that are neither safe, nor follow the law in terms of tax collection and occupancy.

The Hotel Association is opposed to Int. 181. Int. 181 will be a hindrance to responsible development--negatively affecting tourism, jobs and safe lodging options. HANYC looks forward to working with the Chair, Members of the Committee and the entire New York City Council on this issue and other issues of interest.

BUILDING PERFORMANCE LAB
CUNY INSTITUTE FOR URBAN SYSTEMS
CITY UNIVERSITY OF NEW YORK

Robert E. Paaswell, Executive Director, CIUS
Michael Bobker, Director, Building Performance Lab

Newman Hall, 137 E. 22nd St., Room 315, New York, NY 10010
www.cunybpl.org

To: Chair Jumaane Williams and the New York City Council Committee on Housing & Buildings

Regarding: *Letter in Support of* A LOCAL LAW to amend the administrative code of the city of New York, in relation to requiring the base building systems of certain buildings to be operated by individuals with a certificate of proficiency in building energy efficiency from an approved program.

The proposed legislation would ensure that the operators of the largest buildings in New York City are trained to operate their equipment efficiently. The impact on the city's energy use and associated carbon footprint will be quite large, since the buildings directly impacted constitute roughly half of the city's total square footage, and are responsible for roughly 40% of the city's overall energy consumption and greenhouse gas emissions. Presently, operating engineers are trained and licensed to run their equipment safely but without energy efficiency as a consideration. The impact of proper operations and maintenance on building energy use is significant. Studies at Texas A&M University and the Council Rock School District in Pennsylvania show that aggressive improvements in building operations and maintenance can result in as much as a 35% decrease in energy consumption across a portfolio. Proper training is a key part of an optimized energy efficiency maintenance plan. With proper training of building operators, a 2% improvement in efficiency in the largest buildings would result in a greenhouse gas emissions reduction of 0.8%, and decreased annual energy expenditures of approximately $150 million citywide. Reduced demand for energy will result in reductions in the emissions of air pollutants from the burning of fossil fuel within buildings and at electrical power plants.

By ensuring that the operators of building systems are properly trained in energy efficiency in their operating practices, the City will continue to build upon the foundation established in PlaNYC to reduce the City's emissions and better manage its demand for energy. We urge the earliest possible favorable consideration of this legislation.

Respectfully submitted,

Michael Bobker, M.Sc., CEM
Director, CUNY Building Performance Lab

FOR THE RECORD

The City University of New York

BPL
BUILDING *performance* LAB

CIUS
CUNY INSTITUTE FOR URBAN SYSTEMS

FOR THE RECORD

FOR THE RECORD

Associated Builders and Owners of Greater NY

Thank you for the opportunity to comment on these proposals. ABO is supportive of the intent behind most of these bills but we have one broad and several specific concerns. Broadly, we oppose one-off modifications of the Building Code that have not been thoroughly reviewed in context by the Building Codes Advisory Committee and DOB. The City adopted a major triennial update last Fall and we believe further changes should wait for the next review cycle.

Specifically, Int. 13 creates a completely new testing and certification process for building workers. While time is allowed for development, we are concerned that it will both add to bureaucracy and expense for the City and building owners and reduce job opportunities for many mechanically inclined building service workers who understand building systems but might have difficulty with written tests.

Int. 181 adds an unnecessary delay and expense to hotel development without seemingly creating any actual new approval requirements (which we would oppose too).

The Intro on system commissioning requiring a report from the design professional 18 months after a certificate of occupancy is issued raises a host of issues regarding the terms of the contract, payment, and, frankly, expertise. Specifying systems is somewhat different than testing them. If for some reason the building owner is not aware that basic systems aren't functioning properly, the existing benchmarking requirements would tend to alert him or her and retro-commissioning will kick in within ten years.

Thank you again,

Dan Margulies
Executive Director
Associated Builders and Owners of Greater NY
369 Lexington Ave., Suite 215
New York, NY 10017

PRAXIS HOUSING INITIATIVES, INC.

March 31, 2014

Council Member Jumaane Williams
250 Broadway, Suite 1808
New York, NY 10007

FOR THE RECORD

Re: LETTER IN SUPPORT OF T2014-0701 AND T2014-0702

Chairman Williams,

As an architect and developer of affordable and supportive housing in the City of New York, I am writing to ask for your support of T2014-0701 and T2014-0702, bills that will support the health of all New Yorkers.

Obesity has reached epidemic levels where more than half of New York City adults and 40% of K-8 children are overweight or obese. Overweight and obese individuals are at a higher risk for other leading chronic diseases, including heart disease, stroke, type 2 diabetes, and certain cancers. Physical inactivity is a leading risk factor to the obesity and chronic disease epidemic.

Regular stair use increases physical activity, is associated with numerous health benefits, and can be incorporated into the daily lives of most able-bodied individuals. Research has shown that just two minutes of stair climbing per day can burn enough calories to prevent the average annual weight gain of U.S. adults, and climbing about three to five floors per day, on average, has been shown to decrease stroke risk. Regular stair use has also been linked with numerous health benefits, including reduced stroke risk, greater lower limb strength, and improved cardiovascular health.

The bills proposed offer substantial health, safety, and environmental benefits for relatively low cost. Research shows that measures that increase visibility of and access to stairs increase their use. Further, increasing knowledge of stair location through improved accessibility and visibility can improve familiarity with emergency and fire safety protocols. In regards to the use of hold-open devices, other jurisdictions have successfully adopted their use; they are permitted by the International Building Code and various other local building codes around the country, including the Chicago and Kentucky building codes.

Accordingly, and consistent with the recommendations of the New York City Green Codes Task Force, this legislation is being proposed to promote stairway use in New York City by making stairways more accessible, visible and functional and thereby promoting physical activity and public health.

We respectfully urge the earliest possible favorable consideration of this legislation.

Respectfully submitted,

Jolie Andler Milstein
Director of Real Estate

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Icahn School of Medicine at Mount Sinai

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March 31, 2014

FOR THE RECORD

Council Member Jumaane Williams
250 Broadway, Suite 1808
New York, NY 10007

Re: LETTER IN SUPPORT OF T2014-0701 AND T2014-0702

Chairman Williams,

As a physician and professor at Mount Sinai Hospital in the city of New York, I am writing to ask for your support of T2014-0701 and T2014-0702, bills that will support the health of all New Yorkers.

Obesity has reached epidemic levels where more than half of New York City adults and 40% of K-8 children are overweight or obese. Overweight and obese individuals are at a higher risk for other leading chronic diseases, including heart disease, stroke, type 2 diabetes, and certain cancers. Physical inactivity is a leading risk factor to the obesity and chronic disease epidemic.

Regular stair use increases physical activity, is associated with numerous health benefits, and can be incorporated into the daily lives of most able-bodied individuals. Research has shown that just two minutes of stair climbing per day can burn enough calories to prevent the average annual weight gain of U.S. adults, and climbing about three to five floors per day, on average, has been shown to decrease stroke risk. Regular stair use has also been linked with numerous health benefits, including reduced stroke risk, greater lower limb strength, and improved cardiovascular health.

The bills proposed offer substantial health, safety, and environmental benefits for relatively low cost. Research shows that measures that increase visibility of and access to stairs increase their use. Further, increasing knowledge of stair location through improved accessibility and visibility can improve familiarity with emergency and fire safety protocols. In regards to the use of hold-open devices, other jurisdictions have successfully adopted their use; they are permitted by the International Building Code and various other local building codes around the country, including the Chicago and Kentucky building codes.

Accordingly, and consistent with the recommendations of the New York City Green Codes Task Force, this legislation is being proposed to promote stairway use in New York City by making stairways more accessible, visible and functional and thereby promoting physical activity and public health.

We respectfully urge the earliest possible favorable consideration of this legislation.

Respectfully submitted,

Elizabeth Garland MD

Elizabeth Garland, MD, MS
Associate Professor, Director Division of General Preventive Medicine and Community Health
Department of Preventive Medicine, Department of Pediatrics – Icahn School of Medicine at Mount Sinai

DattnerArchitects

April 1, 2014

FOR THE RECORD

Council Member Jumaane Williams
250 Broadway, Suite 1808
New York, NY 10007

Re: **LETTER IN SUPPORT OF T2014-0702**

Dear Chairman Williams,

As an architect practicing in the City of New York, I am writing to ask for your support of T2014-0702, a bill that will support the health of all New Yorkers.

Obesity has reached epidemic levels where more than half of New York City adults and 40% of K-8 children are overweight or obese. Overweight and obese individuals are at a higher risk for other leading chronic diseases, including heart disease, stroke, type 2 diabetes, and certain cancers. Physical inactivity is a leading risk factor to the obesity and chronic disease epidemic.

Regular stair use increases physical activity, is associated with numerous health benefits, and can be incorporated into the daily lives of most able-bodied individuals. Research has shown that just two minutes of stair climbing per day can burn enough calories to prevent the average annual weight gain of U.S. adults, and climbing about three to five floors per day, on average, has been shown to decrease stroke risk. Regular stair use has also been linked with numerous health benefits, including reduced stroke risk, greater lower limb strength, and improved cardiovascular health.

The bill proposed, allowing the use of hold-open devices, offers substantial health, safety, and environmental benefits for relatively low cost. Research shows that measures that increase visibility of and access to stairs increase their use. Further, increasing knowledge of stair location through improved accessibility and visibility can improve familiarity with emergency and fire safety protocols. Other jurisdictions have successfully adopted their use; they are permitted by the International Building Code and various local building codes.

Consistent with the recommendations of the New York City Green Codes Task Force, this legislation is being proposed to promote stairway use in New York City by making stairways more accessible, visible and functional and thereby promoting physical activity and public health. I respectfully urge the favorable consideration of this legislation.

Respectfully submitted,

William Stein

William Stein FAIA
Principal

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ACTIVE DESIGN

FOR THE RECORD

Council Member Jumaane Williams
250 Broadway, Suite 1808
New York, NY 10007

Re: LETTER IN SUPPORT OF T2014-0701 AND T2014-0702

Chairman Williams,

As an architect and Executive Director organization that promotes health through design in the city of New York, I am writing to ask for your support of T2014-0701 and T2014-0702, bills that will support the health of all New Yorkers.

Obesity has reached epidemic levels where more than half of New York City adults and 40% of K-8 children are overweight or obese. Overweight and obese individuals are at a higher risk for other leading chronic diseases, including heart disease, stroke, type 2 diabetes, and certain cancers. Physical inactivity is a leading risk factor to the obesity and chronic disease epidemic.

Regular stair use increases physical activity, is associated with numerous health benefits, and can be incorporated into the daily lives of most able-bodied individuals. Research has shown that just two minutes of stair climbing per day can burn enough calories to prevent the average annual weight gain of U.S. adults, and climbing about three to five floors per day, on average, has been shown to decrease stroke risk. Regular stair use has also been linked with numerous health benefits, including reduced stroke risk, greater lower limb strength, and improved cardiovascular health.

The bills proposed offer substantial health, safety, and environmental benefits for relatively low cost. Research shows that measures that increase visibility of and access to stairs increase their use. Further, increasing knowledge of stair location through improved accessibility and visibility can improve familiarity with emergency and fire safety protocols. In regards to the use of hold-open devices, other jurisdictions have successfully adopted their use; they are permitted by the International Building Code and various other local building codes around the country, including the Chicago and Kentucky building codes.

Accordingly, and consistent with the recommendations of the New York City Green Codes Task Force, this legislation is being proposed to promote stairway use in New York City by making stairways more accessible, visible and functional and thereby promoting physical activity and public health.

We respectfully urge the earliest possible favorable consideration of this legislation.

Respectfully submitted,

Joanna Frank

FOR THE RECORD

AIA New York Chapter

Testimony before the New York City Council Housing and Buildings Committee on T2014-0702 and T2014-0701
April 2, 2014

Good morning Chairman Williams and members of the Housing and Buildings Committee. My name is Rick Bell, and I am the Executive Director of the New York Chapter of the American Institute of Architects. I am here, on behalf of our 5,200 members, to offer testimony on T2014-0702 and T2014-0701 in relation to public access stairs and hold-open devices.

In 2003, AIANY opened the Center for Architecture. Through exhibitions, programs, and special events, the Center aims to improve the quality and sustainability of the built environment, foster exchange between the design, construction, and real estate communities, and encourage collaborations across the city and globe. The Center also celebrates New York's vibrant architecture, explores its urban fabric, shares community resources, and provides opportunities for scholarship. As the city's leading cultural institution focusing on architecture, the Center drives positive change through the power of design.

The Center for Architecture also shows the value of active stairwells. We support T2014-0702 and T2014-0701 because measures that increase visibility of, and access to, stairs increase their use. The Center welcomes 5,000 visitors a month, and of those visitors, ninety five percent take the stairs to reach our gallery spaces and lecture halls. This public access stairway is centrally located and inviting and enables building occupants to utilize stairs to travel between the building entrance level and other levels. Where the common entrance area at the building entrance level provides direct access to an elevator, direct access to a public access stairway is also provided.

In regards to the use of hold-open devices, the Center for Architecture has magnetic hold-open doors, which has proved successful in maintaining access to the stairs. Increasing knowledge of stair location through improved accessibility and visibility can also improve familiarity with emergency and fire safety protocols. Other jurisdictions have successfully adopted their use; they are permitted by the International Building Code and various other local building codes around the country, including the Chicago and Kentucky building codes. New York City should implement them too.

We think that the proposed T2014-0702 and T2014-0701 offer substantial health, safety, and environmental benefits for relatively low cost. Regular stair use increases physical activity, is associated with numerous health benefits, and can be incorporated into the daily lives of most able-bodied individuals. This legislation is being proposed to promote stairway use in New York City by making stairways more accessible, visible and functional, thereby promoting physical activity and public health. As seen at the Center for Architecture, these stairways also promote community and collaboration. They serve as a space for socializing and networking, as well as physical activity.

We respectfully urge the earliest possible favorable consideration of this legislation.

Respectfully submitted,

Rick Bell, FAIA

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ACEC New York

American Council of Engineering Companies c

STATEMENT OF
THE AMERICAN COUNCIL OF ENGINEERING COMPANIES
OF NEW YORK
REGARDING INTRO 14
NEW YORK CITY COUNCIL COMMITTEE ON HOUSING AND BUILDINGS
APRIL 2, 2014

The American Council of Engineering Companies of New York ("ACEC New York") is one of the oldest continuing organizations of professional consulting engineers in the U.S. ACEC New York represents 270 member firms throughout New York State that collectively employ more than 20,000 people statewide, and design all aspects of the built environment. Over 60 of our members, all licensed professional engineers, contributed countless hours to the recent code updated that spanned close to 3 years and resulted in the 2014 Construction Codes.

ACEC New York thanks the Committee for providing the opportunity for us to comment on this legislation. However, after careful review of the bill by our Mechanical Codes Committee, we have some concerns about this bill.

In our opinion, such requirements would impose an unreasonable and unenforceable burden on design professionals and the construction industry and may have no meaningful impact on energy use in buildings.

The premise of the proposed local law is that oversized equipment is causing inefficiencies in the operation of buildings. The size of equipment doesn't determine the energy use in a building. Equipment operates to maintain space temperature set-points within a building envelope. Set-points and the building envelope performance are currently governed by code and documented in the design documents by an established process. A smaller piece of equipment running for a longer time consumes as much energy as a larger piece of equipment running for a shorter time when both are being operated to serve the same load.

Modern HVAC equipment is often provided with modulating controls that improve system performance at part load which actually reduces energy consumption. The installation of larger equipment with an ability to recover more quickly from setback temperatures means a more aggressive set-back can be employed and more energy can be saved. Equipment with limited capacity often prevents a building from employing a set-back.

HVAC design is an art, not a science. Years of experience and extensive professional judgment is required to design a building's HVAC systems in accordance with Codes, and with owner and architectural requirements. The engineer's seal is a statement by the design professional that he has complied with all such requirements. That should be sufficient for any government agency to satisfy the requirements in their codes.

Intro 14 states that the "building authorities cannot easily review anticipated loads or readily discern whether a building will meet energy efficiency standards without such information included in construction documents." We understand the difficulty that an examiner may encounter when trying to review design documents and believe that this may be the reason why other jurisdictions in New York State rely on the Com Check forms as the New York City Department of Buildings currently does. Com Check includes a check box where the design engineer is required to affirm that, among other requirements, load calculations have been completed for the project. The Com Check process provides a clear indication of compliance or lack of compliance and eliminates any need for the inspector to work outside of their skill set.

Since NYC cannot waive the NYS Energy Code requirements, any additional requirements imposed by the local law would be in excess of the existing process and result in duplication of documentation. The cost of this duplicate documentation of compliance will represent a further burden on construction projects in NYC.

The goal of the model code effort was to bring NYC closer in line with the national model codes. The proposed requirement does not appear in the model codes and starts to turn NYC back in the direction where local rules complicate, and potentially delay, the filing and construction process. The cost of this duplicate documentation of compliance will represent a further burden on construction projects in NYC.

Completing the required calculations requires data that is often not available to a team designing the alteration of a portion of the building. Equipment installed as base building infrastructure is often designed and filed before any floor layout have been conceived. The information required under the proposed amendments to Section 106.6 is generally not available at the time of this filing. A boiler replacement, chiller replacement or other equipment replacement may be completed separately from the alteration of building spaces.

Sizing the central heating or cooling equipment based on the sum of the loads identified in the proposed amendments to Section 106.6 will likely result in an increase in the size of equipment because it does not allow for the diversity of system operation that is generally used to make the final equipment selection. This is an element of the "art" component discussed above and cannot be quantified by calculations. It will be difficult for an engineer to justify installing equipment sized smaller than the sum of the loads identified by the detailed calculations which may result in larger equipment being installed.

Many of the items required under the proposed amendments to Section 106.6 have an insignificant impact on the energy requirements of the building. The design engineer is the person most qualified to determine how these factors should be incorporated into a final design.

ACEC New York thanks you for the opportunity to testify on this bill.

REBNY®
REAL ESTATE BOARD OF NEW YORK

FOR THE RECORD

TESTIMONY OF MIKE SLATTERY
SVP, REBNY
CITY COUNCIL HOUSING AND BUILDINGS HEARING
APRIL 2, 2014
RE: INTRO 181

The Real Estate Board of New York is a trade association representing 15,000 builders, owners, managers, brokers and other professionals active in the real estate industry of New York. We would like to submit the following comments on Intro 181 which would require as of right hotel projects to submit plans to the community board in which the project is located as a requirement for submitting an application for construction.

As of right development has been an essential aspect of the growth and prosperity of our city. Likewise, our Zoning Resolution probably contains the most comprehensive controls on the size, location and uses of new development of any major city in the country. In the last decade, almost half the city has been rezoned for growth and preservation. In view of the importance of as of right development and the comprehensiveness of our Zoning Resolution we think this mandatory community review impedes and undermines the as of right development vital for our physical growth and adds another requirement to build in New York which already has many hurdles to new development.

Tourism has been an important growth sector in the city's economy and the development of new hotels is driven by this demand. Delaying construction for 60 days and requiring a submission of plans and a public hearing is imposing a burden on new development which is already difficult and complicated. Also, hotel development is permitted only in commercial and light manufacturing districts which are most suited to accommodate this use. Requiring a public hearing seems unnecessary since the zoning resolution adequately deals with the location and the design of these buildings. If communities think that hotel use is inappropriate or should be reviewed more closely to preserve the neighborhood character, it should make that case through the planning process.

Finally, based on one reading of this bill, it would seem that the community board could delay a project indefinitely by failing to certify that the plan has been submitted or the hearing held. Also, for projects reviewed by the community board as part of a ULURP or a BSA application it is not clear that these hearings would satisfy this requirement.
This bill adds more time and process to new hotel development without any apparent benefit to the community or the city.

Statement of Ya-Ting Liu
Director, NYC Sustainability Program
New York League of Conservation Voters

City Council Committee on Housing and Buildings
April 2, 2014

Good morning. My name is Ya-Ting Liu, and I am Director of the New York City Sustainability Program at the New York League of Conservation Voters (NYLCV). NYLCV represents over 25,000 members in New York City and we are committed to advancing a sustainability agenda that will make our people, our neighborhoods and our economy healthier and more resilient.

NYLCV strongly supports the suite of green building legislation before you today because green building codes are not only an essential tool in reducing our city's carbon footprint, they are key for ensuring the basic health and safety of New Yorkers across the city.

First, building green is an economic development tool to connect the workforce to good paying, skilled jobs. Int. 13 will give building superintendents an opportunity to earn a certificate in building energy efficiency, increasing their skill sets and earning capacity.

Second, building green is a cost effective strategy that will save building owners and tenants money in the long run. Int. 14 and Int. 184 will require an analysis of heating and cooling needs and actual heating loss through building walls during the building design phase so that systems will be properly sized, less expensive and more efficient. Insulating exposed pipes and using energy-efficient bulbs on construction sites are other types of simple cost-effective strategies that work and yield results.

Third, building green is critical to improving public health. Indoor air quality, particularly from mold, disproportionately impacts children, low income families and communities of color. By requiring the use of mold-resistant materials in moisture-prone locations like bathrooms will help protect those most susceptible to asthma and other respiratory issues. The Council can encourage health through active design by making stairs more accessible and usable. Since mold prevention and ensuring stairs are usable during power outages are also key for building resiliency, these bills have renewed urgency since Hurricane Sandy.

The City Council has a long tradition of city, state and national leadership in making our buildings green, more energy efficient and more resilient in the face of extreme weather events and extended power outages. We look forward to working with Chair Williams and the members of this committee to continue to make our people healthier, our neighborhoods stronger and our city more resilient through green codes.

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NECA
NEW YORK

Committee on Housing & Buildings
Testimony by Christine Rangel
Preconsidered Intros re: "Construction Site Lighting" & "Tree Protection"
April 2, 2014

Good morning, my name is Christine Rangel. Today I speak on behalf of the New York City Chapter of the National Electrical Contractors Association. We are the voice of the unionized electrical construction industry in New York City, Westchester and Fairfield Counties. We are comprised of 200 unionized member firms employing over 15,000 men and women, contributing to over 20 million man-hours of work per year.

There are two bills that are chiefly of concern to the contractors who build this City's skyscrapers, schools, walkways, bridges and tunnels: "Construction Site Lighting" & "Tree Protection".

NECA New York **opposes** the Preconsidered Intro regarding Construction Lighting. We support the efficient use of energy. However, the enactment date of this bill is worrisome.

The bill states that if a contractor pulled a work permit prior to January 1, 2014, then this new rule does not impact the job. However, permits are pulled every single day. What about permits being pulled right now? Yesterday? Tomorrow? Contractors are not aware of this new rule, and therefore cannot be expected to abide by it "effective January 1, 2014." Contractors must be given ample time to adjust to this change.

Contractors bid a job based on cost. This rule gives contractors a strange "limbo" period: if you began work after Jan. 1 with no knowledge of the rule, you will be in violation of the rules. This rule would now give inspectors the ability to walk a job and issue a violation for noncompliance where no contractors were ever aware that the new rule existed. Now the contractor is given a fine, and in addition, must correct the violation by changing all of those bulbs. Suddenly if you have a job with 40 floors where you have to buy energy-efficient bulbs, you have a big cost issue on your hands, in both labor and materials, where the contractors never knew such a rule existed. For this reason, we ask that the take effect date would be moved to a date that is a reasonable amount of time to allow for adjustment to conform to the new rules plus confirm to the new costs, and add those costs into future bidding. We support energy efficient initiatives, however, with no time to comply, the rule increases the cost of construction. If we have a year to prepare for this cost, the economic hardship would be a palatable one. We feel that a year would be a reasonable amount of time.

Finally, the Preconsidered Intro regarding "Tree Protection" is unreasonable. Section 3309.11 sets up requirements to be followed when trees shall be disturbed or removed. Establishing a "10 foot rule" (for all construction work, not just the mixing of harmful substances as it presently reads) that would trigger the requirements is objectionable. The contractor should be able to determine when his work will disturb trees. If he disturbs a tree and didn't follow the rules, he should be found to be in violation; but he should not be charged with a violation just for working within 10 feet of a tree when he is not going to be disturbing the tree. This rule would especially harm our contractors who perform streetlight and traffic lighting.

Accordingly, we strongly **oppose** such bills.

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Improving the Built Environment Since 1972

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Measurement & Verification of the *Green Supers* Program

Need Copies

Final Report

August 23, 2012

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Contents

Executive Summary

Steven Winter Associates, Inc.'s (SWA) Measurement and Verification (M&V) of the *Green Supers* Program (the Program) offered by 32BJ Training Fund quantified building energy savings, examined retrofits, and evaluated operational changes as a result of superintendent and building staff participation in the Program's classes. M&V not only provides a basis for the Program's potential evolution, but also a closer analysis of the value of operations and maintenance training programs in general. Both energy-related and non-energy-related benefits were studied.

The 32BJ Training Fund, a labor-management organization, offers training courses on a multitude of topics to union members working in the property service industry. The *Green Supers* Program was established in 2010 with a grant from the US Department of Labor's Employment and Training Administration. The Program is a rigorous 40-hour course that teaches participants the mechanics of building science and green operations and maintenance.

The evaluation of the *Green Supers* Program focused on energy savings and other environmental benefits as a result of participation. The SWA project team conducted interviews with 38 participating superintendents, performed on-site visits to measure and verify implemented energy conservation measures, collected, benchmarked and analyzed building energy usage data using WegoWise for 43 buildings, and enrolled interested parties in NYSERDA's FlexTech Benchmarking Program. Best candidate buildings were selected for further analysis; this was not a random selection. From this, four buildings were selected for Whole Building Case Studies and eleven buildings for Isolated ECM Case Studies. These efforts informed the Executive Briefing Book.

The industry standard metric of analyzing heating energy usage in buildings is British Thermal Units per Square Foot per Heating Degree Day (BTU/SF/HDD), which accounts for weather severity year to year. Based on SWA's energy audit experience and prior research, an energy efficient building is one that falls within the 5-8 BTU/SF/HDD range; 35% of the 32BJ buildings analyzed fall within this range. The average performance range is slightly higher, varying between 9-12 BTU/SF/HDD; 41% of 32BJ buildings fall within this range. Based on feedback from superintendent interviews, this statistic showcases the impact a trained superintendent can have on building energy usage. In a climate where capital budgets are tight, focus is shifting to optimizing operations to reduce costs and 32BJ superintendents have demonstrated the necessary skills for reaching these energy efficient and cost saving goals.

32BJ conducted phone surveys to gauge what types of ECMs were implemented, as well as the frequency of each. Of 500 survey calls, the results indicated over 1,000 ECMs were implemented in buildings across the five boroughs. The SWA project team benchmarked 43 buildings and conducted 38 superintendent interviews. From this group 92% of the superintendents' implemented ECMs in buildings as a result of the Program, this realized energy savings between 1 – 14%. The surveys are related in their goal of obtaining information on ECMs and program feedback but differ in the sense that the SWA conducted surveys were more in depth. SWA conducted interviews were correlated with the superintendent's energy

usage data for their building and from there obtaining information from the superintendent on what O&M actions and implemented ECMs led to energy savings.

These savings also underscore how the Program can have an immediate impact on both bottom line energy consumption and environmental issues. For example, The Vaux, a 323,735 square foot multifamily building built in 1961 demonstrated real integration of energy efficient operations. The superintendent reported the Program explicitly demonstrated that a different boiler service protocol should be in place. This protocol included recording stack temperature everyday and from this data documenting the need for the boiler to be cleaned. Acting quickly on this new knowledge, the superintendent made a relatively minor process change by implementing a new preventative maintenance policy of twice a year boiler cleaning and recording stack temperature. The building began to reap immediate and substantial energy savings through improved combustion efficiency, as the large boilers fire for heat and DHW throughout the entire year. Accounting for the environmental impact of reduced emissions from #6 fuel oil, this simple O&M process improvement is one of the most impactful changes that have been the direct result of this program. Coupled with the positive feedback from superintendents, the large scale benefits of the program are evident; real energy and cost savings, increased awareness of the importance of preventative operations and maintenance and proactive energy management.

The potential impacts of growing the Program to reach more superintendents and more employers not only cuts energy costs but contributes to PLANYC's goals of reducing the city's greenhouse gas emissions 30% by 2030. Buildings are responsible for 70% of New York City's greenhouse gas emissions. A comprehensive strategy to reduce our city's carbon footprint begins with improving the efficiency of our building stock. **Effective building operations are a critical means to ensure building efficiency and these case studies, as part of this M&V study, have shown that an energy reduction of 5% to 20% is achievable through improving operational efficiency.** Through initiatives such as the *Green Supers* Program, cities can reduce greenhouse gas emissions and improve the environment locally and globally.

Project Summary

The analysis included conducting interviews of superintendents and employers who participated in the training program, utility analysis and benchmarking to compare buildings with superintendents trained through the *Green Supers* Program to typical NYC multifamily buildings of similar use and size, a look at isolated energy conservation measures, and whole buildings case studies.

SWA contacted the superintendents of buildings identified for isolated energy conservation measure analyses and whole building case studies in order to evaluate the *Green Supers* Program training experience, the benefits of participation in the Program and building work undertaken as a result of participation, and to collect suggestions for the training's improvement. This qualitative information complements each building's energy benchmark, carbon reduction equivalents, cost-benefit analysis and other metrics; both arms of data

collection contribute to the M&V project's goal of identifying Program accomplishments and potential improvements. This report details the impact that superintendents can have on their buildings, and provides recommendations on strengthening the *Green Supers* Program to benefit both incumbent workers and their buildings' performance.

Training Overview

The *Green Supers* Program is a joint effort between 32BJ SEIU and employers. It is a 40 hour core course focusing on most aspects of green operations and maintenance. After completing the course, 32BJ members can take the exams for the Building Performance Institute's (BPI) Multifamily Building Operator certification and the Urban Green Council Green Professional (GPRO) Fundamentals and Operations & Maintenance certificate. Out of 1793 superintendents who completed the course, 79% became certified BPI MFBOs, 65% earned their GPRO certificate and 63% earned both.

With new focus being placed on energy and water efficiency, improving indoor health, preventative maintenance and proactive management, the need for building staff trained in green building management is rapidly increasing. The 32BJ Training Fund is providing leading edge opportunities for union members to be ahead of the curve.

***Green Superintendents* 40 Hour Core Curriculum**

1. Building Science & Building Envelope — Covers the fundamentals of building science and examines a whole-building approach to operations and maintenance. Topics include air movement, heat transfer, and relative humidity. Study of the building's envelope includes air barriers, vapor barriers, thermal barriers, air sealing, insulation, pressure boundaries, and compartmentalization.

2. Lighting — Covers all aspects of lighting. Topics include lighting types, quality, efficiency and controls. The unit also discusses appliance efficiency ratings.

3. Heating, Ventilation & Air Conditioning (HVAC) — Covers the essentials of running a building's heating, ventilation, and air conditioning system. Topics include combustion science, combustion efficiency, boilers, controls and distribution as well as efficiency strategies for each of these areas.

4. Field Exercise (HVAC): Mechanical Room and Roof — Onsite visit to a building's machine room and roof where instructors teach superintendents how to perform steady state efficiency tests, maintain rooftop ventilation equipment, and apply efficiency strategies and best practices.

5. Sustainability/Indoor Environmental Quality — Describes the phenomenon of global warming and how energy use and waste generated from buildings contribute to global warming. Students learn that the manner in which they perform their jobs has a direct impact on the environment. Also covers the indoor atmosphere of a building, strategies to avoid and limit indoor pollutants, an introduction to green cleaning and the concept of green purchasing.

6. Water Conservation — Covers the essentials of water use and water conservation strategies. Topics include understanding water use, low flow appliances, leak detection, and leak repair.

7. Field Exercise: Hallway, Lobby, Apartment — Onsite exercise where superintendents learn how to inspect an apartment, evaluate hallways and common areas, and inspect the building's envelope.

8. Utilities & Energy Benchmarking — Covers measuring and managing energy use by understanding and working with utility bills (fuel, gas, electricity, and water). Topics include reading and understanding bills, energy benchmarking, recognizing unusual energy use (trends), and identifying opportunities for savings.

9. Green Building Work Plan — Students develop a basic action plan for improving their buildings based on concepts and strategies taught in earlier units. In addition, the class discusses strategies and techniques to communicate effectively with building owners, tenants, and staff on the individual action plan, including payback and incentives for improvements.

10. Review & Practice Exam — A review and a practice test are given to help prepare for the BPI certification exam. A review is also given as preparation for the GPRO certificate exam.

Methodology

Introduction

SWA worked directly with the 32BJ Training Fund staff to identify buildings for evaluation that spanned many employers, providing a diverse and methodical analysis. Best example buildings meaning responsive superintendents and high probability for energy savings were recruited. Data obtained from 32BJ Training Fund survey calls was reviewed to inform the isolated energy conservation measure (ECM) evaluation. SWA then collected energy use data from a small sample of the surveyed buildings to conduct benchmarking as well as inform the case studies. Data collection activities were performed in conjunction with conducting interviews with superintendents to better understand what was gained from training, what ECMs were implemented as a result of the training and recommendations for improving the program.

All energy usage data was inputted into WegoWise, an online benchmarking platform. Use of this software allowed for comparisons across the data set as well as graphical reporting on energy usage. Based on available energy usage data, superintendent interviews and realized savings, four buildings were selected for whole building case studies and seventeen buildings for isolated ECM case studies. These studies can be found in Appendix A and B. The blog, 32BJ conducted surveys, and green building reports formulated by program participants were also used as part of the evaluation and in selecting buildings for further analysis. The blog is a forum in which participants can share success stories related to the *Green Supers* Program, which is a great resource for finding best practices, new innovative ideas and motivation for implementing ECMs based on their peer's success.

All aspects of the evaluation demonstrate how big of an impact a superintendent can have on improving building operations, the importance of training, optimizing building systems and achieving energy savings.

Step 1: Select Buildings for Evaluation

The project team selected buildings based on feedback from superintendents as part of the 32BJ conducted surveys. Buildings that were suspected to display positive results in terms of implementing ECMs were selected. The project team selected and contacted staff and managers at over 60 buildings in order to:

- obtain energy usage data for high level energy usage benchmarking
- conduct superintendent interviews
- analyze isolated energy conservation measures
- identify and analyze buildings for whole building case studies

Energy data was collected for a total of 43 buildings. From this dataset, SWA selected four buildings for whole building case studies, which involve all of the above analyses along with more intensive examinations of both quantitative and qualitative data and evidence. SWA's analysis encompasses a range of information sources from building energy usage data to interviews with the newly-trained building staff.

Step 2: Data Collection, Analysis and WegoWise

The aim of the data collection effort was to gather utility bills for a minimum of 24 months. From the 43 buildings which provided utility data, 63% provided two years of data, 26% provided one year of data and 11% had incomplete data.

These buildings varied in heating fuels, including natural gas, fuel oil and district steam; some were dual fuel, a combination of gas and oil. The project team uploaded all energy data to WegoWise for analysis.

Using WegoWise for analysis allowed the buildings in the study to be measured on an energy use per square foot basis, to verify savings per building and to compare performance across the dataset. Data in WegoWise is weather normalized to account for harsher climate conditions year to year. Using professional judgment, experience and our existing dataset of multifamily buildings, SWA enhanced the analysis by comparing benchmarks of 32BJ buildings to other NYC multifamily buildings. The comparison was made in total energy usage in BTU/sf.

Step 3: Conduct Interviews & Correlate with Utility Analysis

SWA conducted 38 interviews to obtain program feedback directly from superintendents. Most interviews were conducted over the phone; buildings that participated in NYSERDA's FlexTech Benchmarking Program held in-person interviews on site. Feedback from superintendents about installed ECMs and the timeframe of the installations were then correlated with the energy data from their building to determine if savings resulted. Interview metrics and detailed

feedback can be found in a separate spreadsheet.

In cases where savings were realized as part of the utility analysis in WegoWise, follow up interviews were conducted to document detailed information about the upgrades to better inform whole building and isolated ECM case studies.

Step 4: Identify Isolated Energy Conservation Measures & Whole Buildings for Case Studies
The whole building case studies were selected based on superintendent/resident manager interview noting more than one ECM implemented, pre and post retrofit data available and measurable savings. Savings were determined using a combination of onsite measurement and verification, utility analysis in WegoWise and RS Means cost data as needed.

Based on the results of steps 1 – 3, specific ECMs and whole buildings were selected for more in-depth analysis. The superintendent/resident manager must have participated in an interview to confirm ECM implementation. Another parameter included in the case studies was having complete energy data (pre and post retrofit data) in order to verify savings. In cases where only post retrofit data was available and the superintendent confirmed ECMs had been implemented, SWA included the building in the analysis and used industry standards and professional experience for determining savings.

Based on the 32BJ Training Fund survey calls and SWA conducted interviews, frequency of ECMs was a determining factor in case study selection. Isolated ECM case studies were also selected based on ease of in-house implementation and available data on costs and savings. Where cost data was not available, RS Means was used to provide industry standard cost information as well as 32BJ Training Fund provided rates for in-house labor. RS Means provides cost information to the construction industry so contractors in the industry can provide accurate estimates and projections for their project costs. It has become a data standard for cost estimation and is widely used by the industry as a whole.

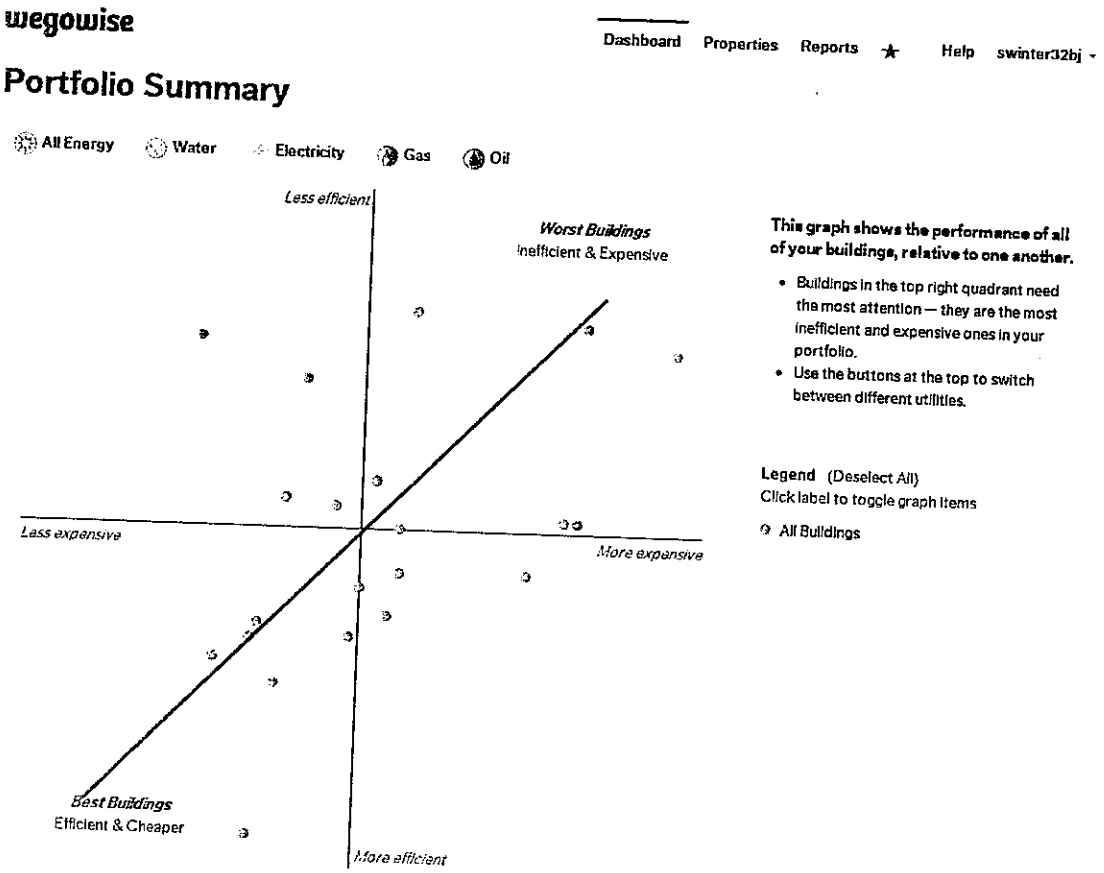
Step 5: NYSERDA's FlexTech Benchmarking Program
SWA expanded the scope of work by drawing on its past experience with NYSERDA's FlexTech Benchmarking Program; 18 buildings were included. Because FlexTech offers free benchmarking and walkthrough audit services, the project team was able to expand on the proposed analysis of selected buildings. Focus was on operational practices of the maintenance team, changes employed as a result of Program participation, successes of new operational and low-cost improvements and potentials for increased efficiency in operations.

SWA drew upon data obtained from these buildings because the FlexTech program has similar goals. Under FlexTech, for example, operational efficiency of the building and its staff is studied as well as how the existing building systems work together and to identify no or low-cost operation and maintenance improvements. Recommendations may include building system adjustments to achieve performance as intended in the original design or to optimize or improve the performance of existing systems. The primary objective is to optimize daily operations, thereby reducing energy consumption without significant capital investment. The

reports for this process were developed with owner-provided equipment/systems, utility usage information and data gathered from site assessments. Any energy efficient capital improvements that were thought to be effective were offered as recommendations.

Step 6: Full Analysis of Energy Use Impacts

Below is a summary chart of all buildings benchmarked taking into account cost and usage. Buildings falling into the top right quadrant are considered most expensive and least efficient. Buildings in the bottom left quadrant are considered the least expensive and most efficient. It should be noted that not all buildings provided cost data along with energy usage data therefore not all 43 buildings appear on this chart. Despite cost data not being available for all buildings the green line on the chart clearly displays the trend for 32BJ buildings to be efficient and cheaper.



SWA benchmarked each building using WegoWise and correlated reductions in energy usage with descriptions of implemented ECMs obtained during interviews. In buildings where ECMs

were implemented but only one year worth of energy data was provided, assumptions of energy savings were made based on the benchmarking, superintendent interview and professional experience.

WegoWise allows for ECMs to be accounted for and savings demonstrated graphically. The trend in the 32BJ sampled portfolio is towards being less expensive and more efficient. These results can be found in their respective case studies in Appendix A and B.

Results & Analysis

Interviews

SWA conducted 38 superintendent interviews. The interviews focused on building operations and maintenance and changes made to these practices due to the training program, how the upgrades were implemented such as process and funding, success of energy conservation measures, etc. The overall trend was very positive with constructive feedback on how to improve the training program.

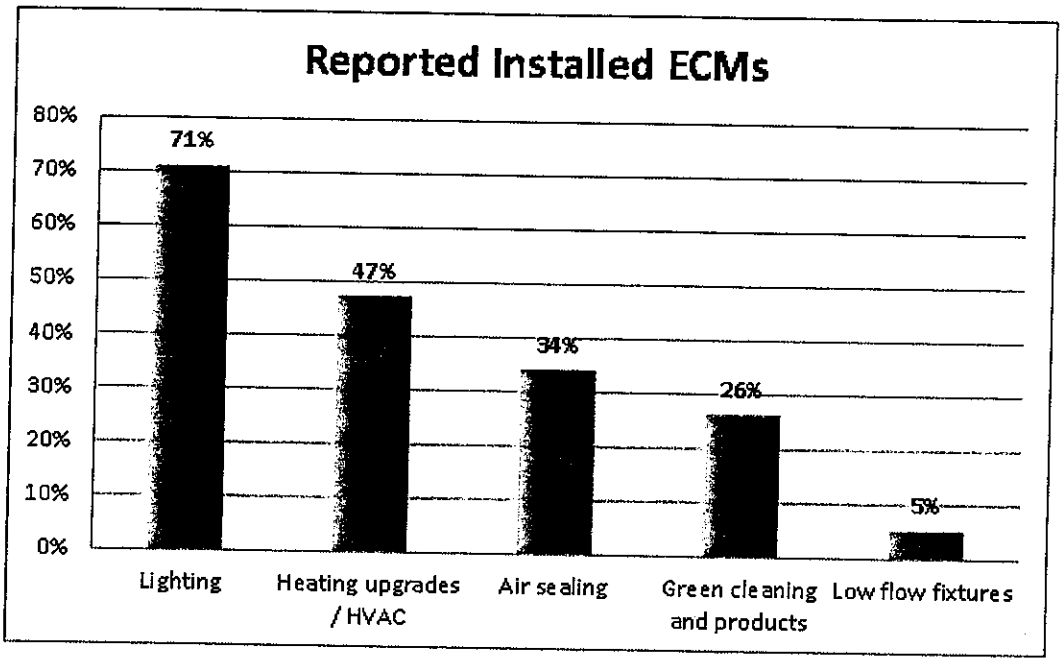
Targeted Employers

The program has a wide range of participating employers. The buildings selected for evaluation and interviews are affiliated with 20 management companies.

To better understand the impacts of training on building staff, SWA also interviewed staff from several management companies. These demonstrate the importance of supporting building staff with training, empowerment, online resources and opportunity for advancement based on building performance. Some examples are: allowing access to the energy bills to better understand how their actions effect performance, providing ongoing support such as video training resources once ECMs have been implemented, and the use of software that helps monitor building systems and alert building staff to irregular energy usage.

Interview Takeaways

SWA conducted 38 interviews with superintendents and resident managers; The Reported Installed ECMs chart is a synopsis of the frequency of installed ECMs.



Most Common ECMs Implemented

The data above in the chart was assembled from SWA conducted interviews. Educating superintendents on not only best practices per building system but focusing on what steps can be taken in-house to increase the efficiencies of these systems is directly reflected in the frequency of ECMs implemented. Isolated ECMs will be discussed in more detail in the following section and presented in Appendix B.

Air sealing and Building envelope measures were the third most implemented upgrade, accounting for 34%. Air sealing which consisted mainly of weatherstripping doors, air sealing around PTACs and spray foam sealing of building penetrations accounted for 56% of the total building envelope retrofits. Insulation accounted for 19% of the total envelope upgrades. Savings from building envelope retrofits can be difficult to quantify due to the combined concept of air movement, stack effect, heat loss, infiltration and exfiltration. However, superintendents not only noted the ease of these retrofits being done in-house but the added benefits it can have on indoor air quality and building durability.

Lighting was the most frequent retrofit (71%). Since lighting retrofits have been common measures in the past it is a measure that owners are comfortable with and a measure that is incentivized by NYSERDA and Con Ed programs. Some superintendents noted the ease in implementing a familiar measure since cost and payback are easy to demonstrate.

HVAC retrofits accounted for 47% of implemented ECMs despite being typically more capital intensive and more difficult to convince owners and boards that they are worth implementing. These upgrades focused more on boiler control tuning and heating system distribution efficiency. **Pipe insulation**, accounting for 3%, increases distribution efficiency and can be done

using in-house staff. These noted retrofits all contribute to a more thorough **preventative operations and maintenance** plan. If buildings systems are not properly maintained, energy savings may not be achieved and the life of the equipment can dramatically decrease driving down the life cycle savings.

Indoor air quality and Eco-Friendly concerns ranked fourth. Switching to **green cleaning products** accounted for 26% of those upgrades in addition to providing a healthier work environment for themselves and their staff which was a big driver of this change in practice. Other practices include implementing recycling programs, the use of low-VOC paints, adhesives and finishes and installing walk-off mats.

Water retrofits were 5% of the ECMs and usually involved the installation of low flow fixtures. Similar to lighting upgrades, these measures are implemented as a result of training and ease of being accomplished in-house. Since aerators and showerheads are a low cost item and can be implemented by in-house staff, payback in NYC is typically between 6 – 9 months. This is well within any buildings yearly operating budget. Other less frequent water retrofits include: installing Energy Star washing machines, WaterSense landscaping water fixtures, installing back flow preventers, collecting rain water, finding and fixing leaks and installing a water meter.

Hurdles to Implementation of ECMs

Determining what factors present barriers to implementing ECMs are important in formulating recommendations not only for the Program but also for owners and managers. For more detailed information, see Appendix A.

Coop or condo boards where there are several decision makers are often more challenging to work with than a single owner and it may be more difficult to make the case for energy efficiency upgrades. Due to the nature of how often boards such as these meet; it can take years in some cases to approve spending for ECMs. Most buildings plan their budget year-to-year and are not able to add items to a yearly operating budget. It is also difficult to prove the benefits of implementing more capital intensive projects within the constraints of desired payback periods which are typically 2-5 years. Sometimes ECMs are cost effective in terms of Simple Payback but ROI is not attractive enough to convince owners and boards to implement.

Convincing owners that actual energy savings will be achieved when savings are dependent on behavior can impede implementation. This can represent a cultural shift in building management and maintenance practices which for some buildings are more difficult. For a superintendent to get all necessary parties on board including the owner, the management company, residents and board members can be the hardest piece.

Whole Building Case Studies

SWA selected four buildings for Whole Building Case Studies in which multiple energy conservation measures were implemented, pre and post retrofit energy data were available and aligned with the timing of the installed ECMs and energy savings were realized or had the potential to be realized in the future. Detailed whole building case studies can be found in

Appendix A.

Isolated Energy Conservation Measures

Based on feedback from superintendents and survey results, SWA selected the following energy conservation measures (ECMs) for further evaluation: building envelope, lighting, HVAC, indoor air quality and O&M. These specific measures were selected based on ease of in-house implementation, frequency of implementation by superintendents and available data on cost and savings.

- Building envelope
  - Air sealing
- Lighting retrofits
  - Lighting replacements
  - Lighting controls
- Heating, Ventilation and Air Conditioning (HVAC)
  - Boiler controls and distribution
  - Pumps and Motors
  - Ventilation
  - Equipment replacement
- Indoor air quality & Eco-friendly achievements
  - Green cleaning products
  - Recycling and waste management
- Operations & Maintenance (O&M)
  - Preventative maintenance plan

The trend and premise for selecting these specific measures focused on no- to low-cost improvements. These types of improvements are easy to implement in-house and can typically be absorbed in a yearly operating budget. Other measures, which can be considered medium to large capital improvements, often are not within the superintendent's direct control.

Even with water upgrades being cost effective and easy to implement in-house, they are not included in the isolated ECM analysis due to lack of water usage data. Despite Local Law 84 which requires all buildings over 50,000 square feet to report energy and water usage to the City of New York, the Department of Environmental Protection (DEP) is automatically reporting this water usage data to the city for each building which means owners do not have easy access to the data. This data is not typically tracked by owners/managers and typically hard to obtain. It is still important to note that implementing ECMs such as low flow aerators and low flow showerheads pay back in 3-6 months depending on existing water fixtures and can easily be installed by in-house staff.

Impact on Energy Usage

SWA examined building characteristics and utility consumption data for 43 buildings through WegoWise, which tracks changes in energy use after building upgrades have been made. By providing normalized monthly usage per square foot, the graphical interface of WegoWise

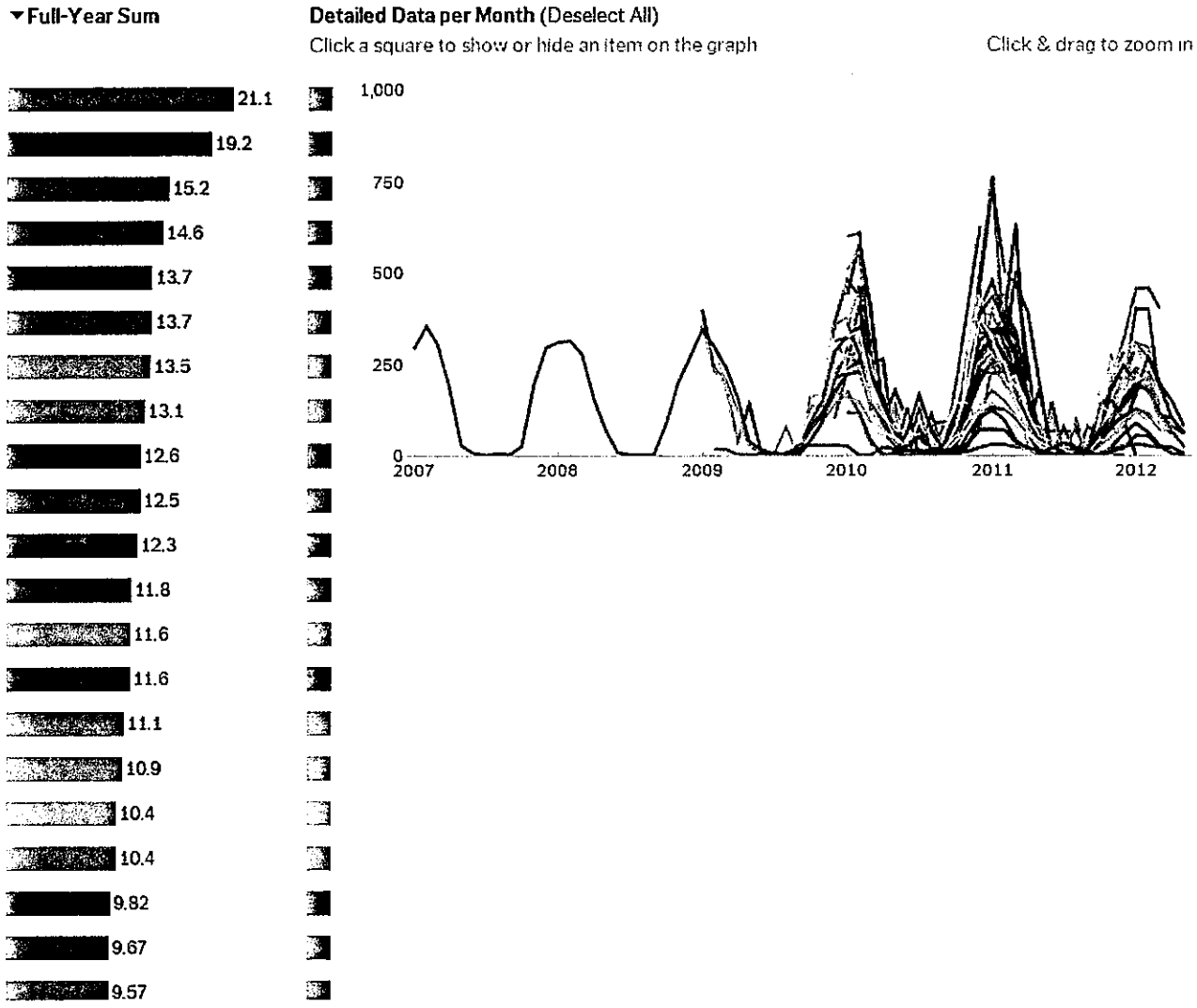
allows for at a glance understanding of changes in consumption patterns. This tool was used to hone in on particularly successful buildings.

In addition, WegoWise allowed SWA to better understand the performance of the buildings studied to other comparable groups of buildings. Based on professional experience, it was determined that the energy consumption per square foot of the 43 buildings studied is in the normal range for NYC market rate buildings. As such, the operational savings realized as a result of the training are very translatable to other groups of buildings.

Finally, since WegoWise automatically uploads energy usage data from utility websites and updates usage profiles, this project has provided a framework for a sustainable tool that both 32BJ Training Fund and superintendents can take advantage of to provide real time feedback on the impact of any future initiatives.

Energy data for all 43 buildings can be viewed by logging into WegoWise. The graph below, taken from the 32BJ Training WegoWise portfolio, shows total energy in BTU per square foot for a sample of the properties.

in Btu per square foot (conditioned) Show Raw Data Bookmark This Report Download Data (.csv)



Conclusions

Importance of Training

The evaluation of the Program demonstrates the importance of training and the impact it can have on career growth and energy savings. Of the 38 superintendents and resident managers interviewed, the majority responded with praise and enthusiasm for the Program. Anecdotal information collected through interviews revealed that many superintendents and resident managers took what they learned from the course and applied it to their building. For example, lighting upgrades, including the installation of motion sensors, the use of green cleaning products and air sealing around packaged terminal air conditioners (PTACs) were mentioned repeatedly as executed measures.

The training provided participants with a foundation for understanding building science and energy efficiency improvements. Also being with like-minded individuals who operate analogous buildings fostered a comfortable learning environment. While it is assumed the participants have been involved in the building industry for a number of years, ranging from porter to superintendent to resident manager, many admitted to lacking the terminology associated with building systems and sustainability. The class was credited with empowering them with a set of tools to better understand the basics of heating, ventilation and air condition (HVAC) systems, lighting and how to benchmark and analyze energy consumption. Not only did the course teach specific ways to make their buildings more energy efficient and comfortable for tenants, it also heightened awareness providing a practical way of thinking:

> *"Creating this program was a brilliant stroke that will eventually change the way that all supers in New York City run their buildings, regardless of whether they participated in the Green Supers Program or not." Judd Cady, Resident Manager*

The long term value of training, includes engendering a cultural change in terms of operations and maintenance. It is worth noting that several superintendents are now teaching classes at the 32BJ Training Fund, passing on what they've learned to others in the industry.

> *"Training really gave me a higher purpose. It helped me understand there is a legacy; there is a trans-generational reason why we do what we do. Not just a job, an adventure. I'm now teaching my other brothers and sisters what I learned and passing on good information". ~ Victor Nazario, Resident Manager*

Independently making changes to buildings by implementing retrofit measures are significant feats. The building workers who took advantage of the green coaching provided by the Program found it to be helpful, especially for lighting upgrades and adjusting heating controls. The biggest obstacles cited were cost and convincing co-op boards or management companies that a retrofit would pay off. Although these issues may have prevented some work from being done, the *Green Supers Program* has given many superintendents and resident managers the skills to effect change going forward.

Training for building staff is crucial in terms of achieving energy and cost savings, maintaining those energy and cost savings and contributing to the larger goal of cutting NYC's greenhouse gas emissions since 70% of the city's emissions result from building energy usage. As seen in the case studies there are measurable energy and cost savings associated with ECMs that were implemented as a result of the Program.

The project has been a positive learning experience for all parties involved. The SWA project team is confident the final result will be used as an example in the building industry as to the importance of training programs, to develop energy efficiency and sustainability-focused curriculum, secure funding for training, and demonstrate to management companies the value of training and empowering their staff. Buildings are only as good in terms of performance, as the staff that maintains and manages them.

Recommendations for Improving the Training Program

Though feedback for the Program was very optimistic, several individuals also had constructive suggestions on how to refine it. Some felt the training moved at a pace that was either too fast or too slow for their particular experience, and recommended stretching the curriculum out over a longer period of time, or placing students into classes based on skill level. SWA suggests creating an accelerated class for those with a strong background and a broader class for those with less experience.

Another request was to include more in-depth training on heating plants and cooling equipment. Since these are the largest and most costly systems to operate, many superintendents wished they had more hands-on experience, including additional field trips to boiler and mechanical rooms. There was a strong desire among most interviewees for increased empirical and tactile learning experiences. Lastly, several superintendents asked for a long but simple checklist of potential energy conservation measures that they could use as a reference guide. This agenda would be a reminder of what energy conservation measures to focus on, and would help in building a case to their management companies that energy efficiency retrofits are important.

Based on the feedback from the superintendent interviews and SWA's understanding of the program's limitations, there are a few additional suggestions that should be taken into consideration. WegoWise membership should be maintained to continue to monitor and verify energy savings that will be realized over the years. Changes in operations and maintenance practices tend to be realized over a greater time period than one year. This allows 32BJ Training Fund to continue to provide measurable outcomes for future funding opportunities and increased employer involvement. Further on this point, a dedicated 32BJ employee should be monitoring WegoWise on a regular basis to provide real time feedback to superintendents on how implemented ECMs have saved energy. It can also be used as a training tool to showcase other 32BJ buildings by demonstrating real savings from NYC buildings where the program participants' peers have realized energy savings, due to implementing ECMs learned about in the Program.

The Program should be scaled up to account for market demand of building management and maintenance staff skilled in utility analysis, identifying ECMs based on energy usage analysis, cost, savings and payback analysis, knowledge of funding programs and preventative maintenance planning. Local Law 84 and Local Law 87 in NYC require all buildings over 50,000 square feet to benchmark energy and water usage, conduct an ASHRAE Level II energy audit and a retro-commissioning study. Building staff who obtained energy analysis knowledge under the Program will have the necessary skills to submit energy and water usage to NYC for Local Law 84 compliance. Local Law 87 will involve sampling, monitoring and reporting of all base building systems. Superintendents participating in the Program have the skills to support the owner's and manager's efforts in this process and will better position employers in terms of compliance.

Employer involvement and empowerment is a critical tool superintendent's need in implementing ECMs. 32BJ Training Fund should continue to work closely with employers, engage new stakeholders, provide forums for union members and employers to impart knowledge and success stories, and continue to stress the important effect maintenance and operations have on preserving energy efficient buildings. Knowledge sharing and continued education is vital to 32BJ's members and the future of New York City's building stock.

Appendix A – Whole Building Case Studies

Green Supers Program

The Future — 200 East 32nd Street

Building Characteristics

Type	Market-Rate Condo
Year Built	1991
Square Footage	213,548
Stories	35
Units / Bedrooms	165 / 297
Heating System	Electrically heated PTHPs

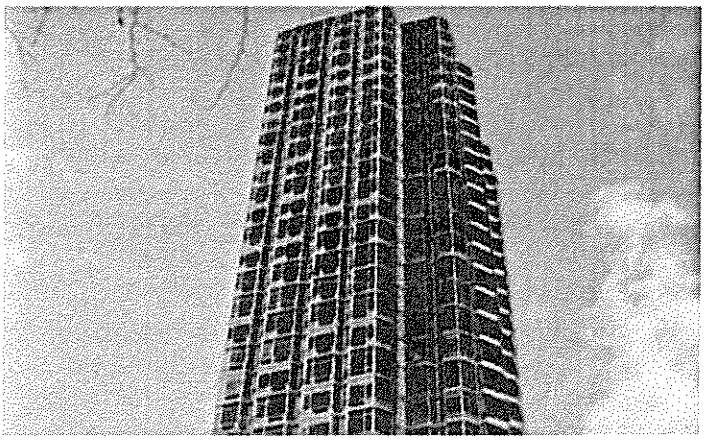
Energy Profile

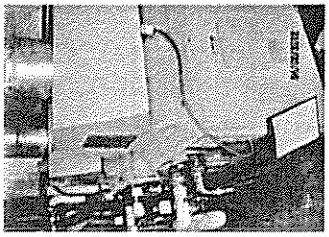
Heating Energy Pre	3.26 BTU/SF/HDD
Heating Energy Post	2.78 BTU/SF/HDD
Total Energy Use Pre	66 kBTU/SF
Total Energy Use Post	57 kBTU/SF
Electricity Pre	12.5 kWh/SF
Electricity Post	10.6 kWh/SF
Carbon Reduction	213,500 lbs. of CO_2

Energy Conservation Measures

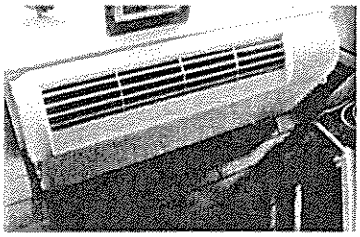
Upgraded Packaged Terminal Heat Pumps (PTHPs)

Air Sealing





Old DHW boilers being replaced with condensing boilers



New packaged terminal heat pump

The Future's resident manager, Sean Wade, demonstrates the potential of what building staff can achieve with energy conservation and building performance training. Though a substantial amount of energy upgrades at The Future were started in the 4 years prior to his participation in the *Green Supers Program*, Wade credits his interest in higher performance standards, as well as the installation of other specific energy conservation measures, to his 32BJ training. Mechanical upgrades to building HVAC systems and building envelope improvements positively impacted The Future's bottom line energy performance. Resident training sessions, geared toward teaching the unit-owners best practices for utilizing new in-unit HVAC systems, were notably effective in ensuring these newly installed components were optimized for peak performance. Upgrades to DHW production systems are planned for 2012, similarly guided by insights from the training.

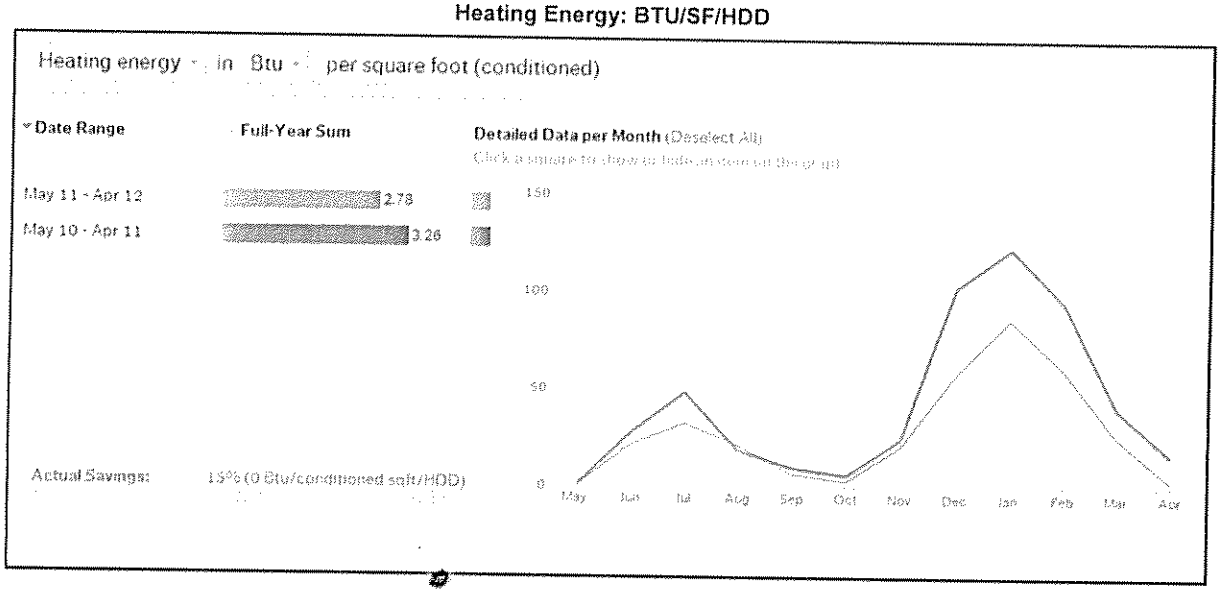
Existing Conditions

The Future is a luxury 35 story multifamily condominium building in Manhattan. Built in 1990, the building contains 213,548 square feet of conditioned space and a total of 165 dwelling units and 297 bedrooms. The building is electrically heated, with Packaged Terminal Heat Pumps (PTHPs) serving each unit. Domestic hot water is provided by a total of six natural gas-fired boilers, each coupled with a 200 gallon storage tank, distributed evenly between a high zone and a low zone.

Energy Indices

Heating Energy, or Heating Slope, is a common indicator used to demonstrate energy consumption in a manner that is normalized for varying climate conditions. The following chart demonstrates the year-to-year change in Heating Energy at The Future between May 2010 and April 2012. Reported in BTUs per square foot per Heating Degree Day, this metric is an industry standard for reporting energy use in heating-dominated climates. The Future demonstrated an impressive 15% reduction in Heating Energy over the reporting period, dropping from 3.26 BTU/SF/HDD to 2.78 BTU/SF/HDD. These savings can be seen as the direct result of efficiency gains in space heating equipment performance and building envelope performance.

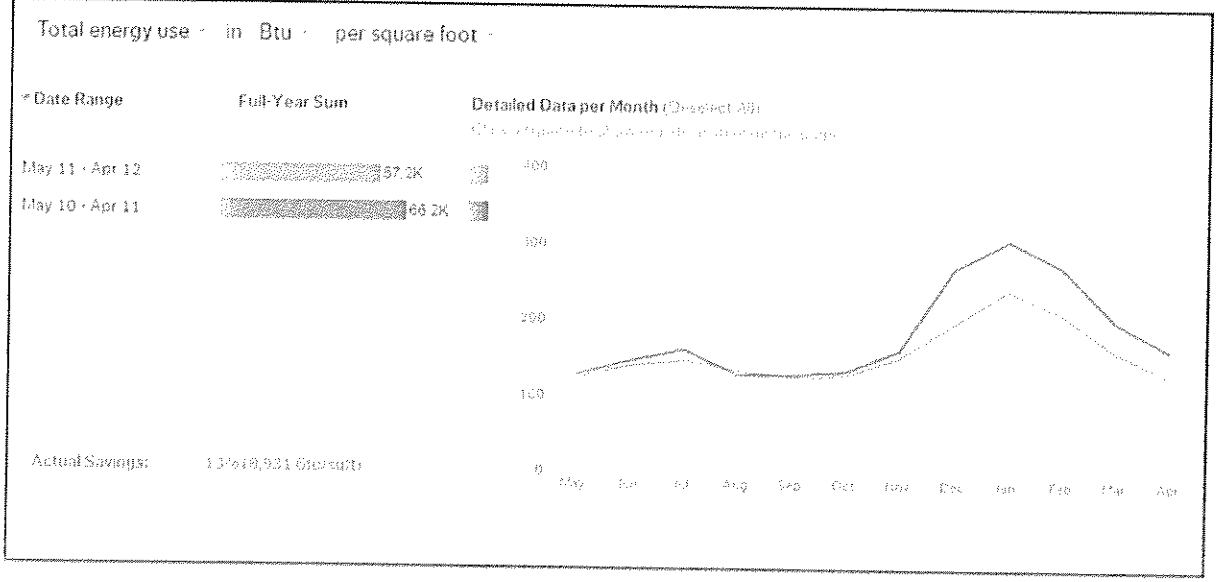
Heating Energy: BTU/SF/HDD



Total Energy Use is an indicator of the total amount of energy consumed by a building, typically reported in kBTU/ square foot/year. The following chart demonstrates the year-to-year change in Total Energy Use at the Future between May 2010 and April 2012. The Future demonstrated a 13% reduction in Total Energy Use over this two year period, which coincides with the resident manager's training program. Note that Total Energy Use is a metric that is not reported in weather normalized terms, meaning that seasonal climate fluctuations are not captured in the data. Total Energy Use is limited for comparative purposes because it lacks weather normalization, however it remains a widely cited metric and is worthy of inclusion. The chart below shows that the majority of Total Energy savings realized by The Future was in the form of a Heating Energy reduction.

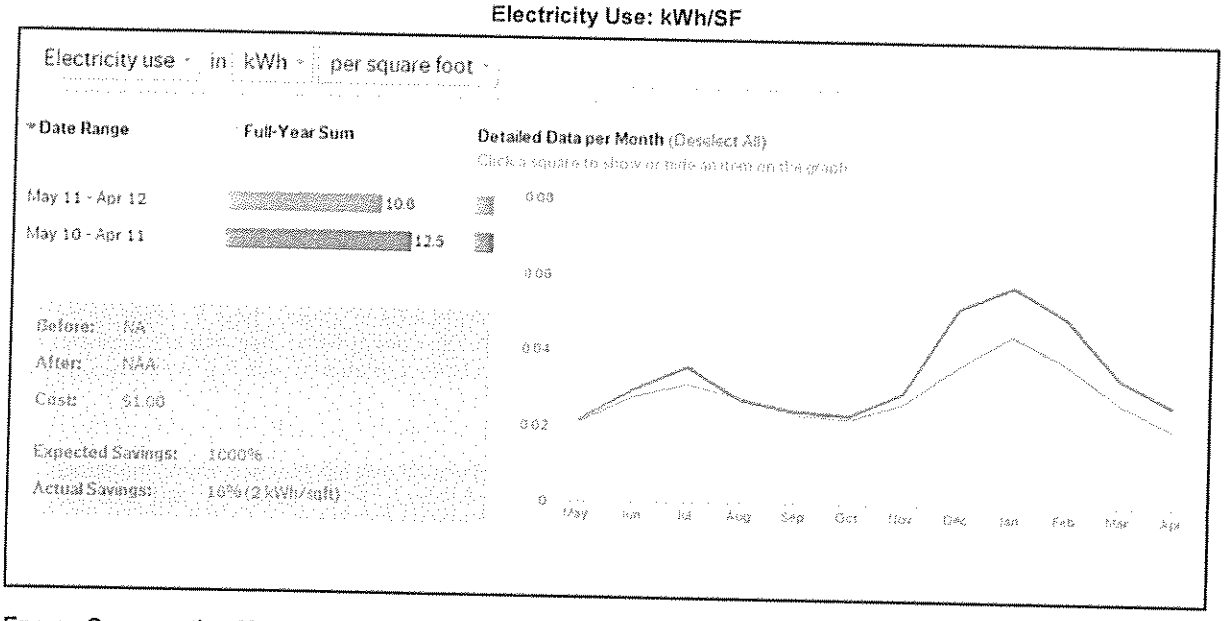
Total Energy Use can also be demonstrated in terms of carbon reduction. The Future realized a 14% reduction in carbon emissions over this period: 14.4 lbs. CO_2 per square foot in 2010 and 2011 to 12.3 lbs. CO_2 per square foot in 2011 and 2012, for a total annual reduction of 213, 500 lbs. CO_2.

Total Energy Use: kBTU/SF



Electricity Use is an indicator of the total amount of electric consumed by a building, typically reported in kWh/square foot/year. The following chart demonstrates the year-to-year change in Electricity Use at The Future between May 2010 and April 2012. Note that Electricity Use is a metric that is not reported in weather normalized terms, meaning that seasonal climate fluctuations are not captured in the data. The Future demonstrated a 16% decrease in Electricity Use over this two year period. As the monthly chart below demonstrates, in 2011/12 The Future reduced electric consumption throughout the entire year, with savings most pronounced in the peak heating season. Significant savings were also realized in the peak cooling season. This information suggests HVAC upgrades to the PTHP units had a significant impact on the electric reductions that were achieved.

Electricity Use: kWh/SF



Energy Conservation Measures

The following Energy Conservation Measures were implemented at The Future following the training:

ECM	Annual Electric Savings (kWh)	Annual Fuel Savings (MMBtu)	Total Annual Energy Savings (MMBtu)	Estimated Annual Savings	Estimated Installed Costs	Simple Payback Period (years)	Rate of Return	SIR
PTHP Upgrade	107,843	N/A	368	$21,000	$262,500	12.5	8%	1.2
Air Sealing	46,014	N/A	157	$3,500	$14,000	4.0	25%	2.5
TOTAL	**153,857**	**N/A**	**525**	**$24,500**	**$276,500**	**11.3**	**9%**	**2.2**

Packaged Terminal Heat Pump (PTHP) Upgrade

After completing the training in March 2012, the in-house maintenance staff at The Future began a program of installing new PTHPs in approximately 60% of the condo building's 165 dwelling units (350 total PTHPs replaced). The newer PTHPs boast a higher Energy Efficiency Ratio (12.1 EER vs. 10.9 EER in old model), which indicates greater cooling efficiency per unit of electrical input, and a higher Coefficient of Performance (3.7 COP vs. 3.3 COP in old model),

which indicates a greater amount of heat delivered by the heat pumps per unit of electrical input. Additionally, the newer PTHPs utilize a significantly more advanced control sequence, driven by an improved thermostat which is coupled with a more complex computerized control logic. This upgraded control board reacts more precisely to both indoor and outdoor climate conditions, allowing for reduced hours of operation. The control logic also ensures the PTHPs spend a greater percentage of their operating hours in heat pump mode, as opposed to the extremely inefficient electric resistance mode. Being a sub-metered electrically heated building, the cost of buying and installing the units, as well as the resulting energy savings, accrue to the individual condo unit owners. Annual electric savings associated with this measure are upwards of $21,000 per year. The remainder of the older units will likely be upgraded within the next 12 months, with significant savings likely to follow.

Air Sealing
Efforts were also made to reduce energy use and improve indoor air quality by thoroughly air sealing PTHP penetrations at the time of installation. Gaps around the new PTHPs were sealed with tight gaskets, and plans have been made to incorporate future air sealing as a standard maintenance in an effort to keep the units tightly sealed. The new PTHP units themselves contribute to improved building envelope performance; the new PTHPs are rated for 7 CFM of infiltration at 25 MPH wind, compared to an industry standard of 19 CFM. Air sealing efforts can be associated with an annual reduction of approximately $3,500 in heating costs, a figure that will rise when the additional PTHP units are replaced and properly air sealed.

Resident Training
Moreover, the resident manager helped conduct a tenant seminar on the new PTHP units, recognizing that energy efficient equipment can only be as efficient as its operators. The seminar explained to tenants how the distribution systems worked, and how they could operate the units with maximum comfort and energy efficiency. Wade's ability to conduct such a seminar hinged on his own expertise on the subject—a direct effect of training with the *Green Supers Program*.

Conclusions
The Future and its staff represent a model building, one that has achieved sizable energy savings and is also managed and operated in an exceptionally well manner. The newly installed high efficiency PTHP units, coupled with the corresponding air sealing effort (and the tenant training), showcase a comprehensive retrofit measure, whereby the resident manager took action to ensure the HVAC equipment was updated, maximized, and functioning to the best of its ability. The integrated combination of HVAC and building envelope improvements has raised the bar by generating a 13% reduction in the use of heating energy and a 14% reduction in total carbon consumption. This type of holistic energy conservation plan, lead by a highly qualified building operator, is the goal of the *Green Supers Program*.

Green Supers Program

The Sierra — 130 West 15th Street

Building Characteristics

Type	Market-Rate Rental
Year Built	2002
Square Footage	343,534[1]
Stories	14
Units / Bedrooms	276 / 420
Heating System	Hydronic Boiler / Hot Water PTACs

Energy Profile

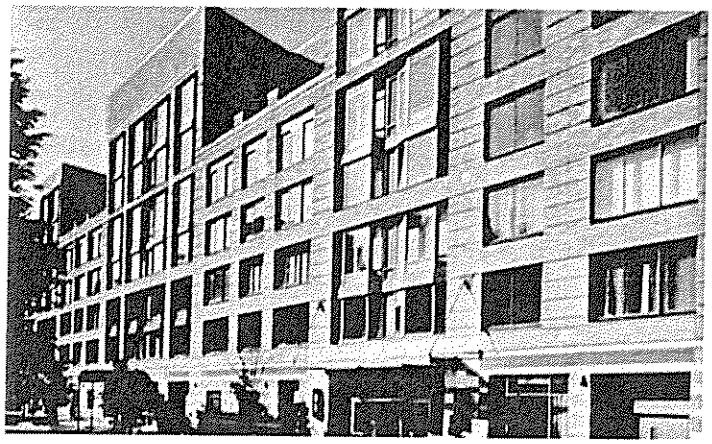
Heating Energy Pre	4.9 BTU/SF/HDD
Heating Energy Post	4.7 BTU/SF/HDD
Total Energy Use Pre	39.5 kBTU/SF
Total Energy Use Post	34.6 kBTU/SF
Electricity Pre	2.15 kWh/SF
Electricity Post	2.17 kWh/SF
Carbon Reduction	195,800 lbs. CO_2

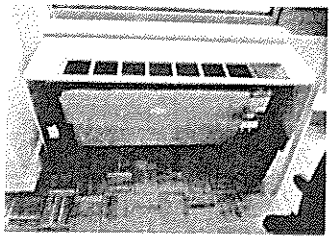
Energy Conservation Measures

HVAC/DHW Distribution Bypass & VFD Optimization

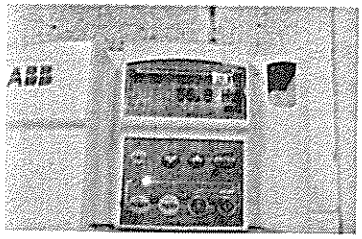
Lighting Upgrades

Air Sealing





Air Sealing around PTACs has been effective for energy and IAQ



O&M changes have optimized VFD controls and reduced pump power

Patrick Long, resident manager of The Sierra, completed the *Green Supers* program with an improved ability to manage O&M issues, as well as with a new understanding of sustainable practices that might be applied in his building. His participation in the training has engendered a "cultural change" in his approach to building management, renewing his motivation to improve operating practices. The program has instilled a newfound sense of "ownership" over his building's energy use. Since the training, The Sierra has enacted an expansive program of O&M process improvements, coupled with the installation of cost effective energy conservation measures, including those related to HVAC, lighting, and building envelope improvements. The Sierra is an example of the benefits that can result when a building's management staff conscientiously shifts toward an energy conservation agenda.

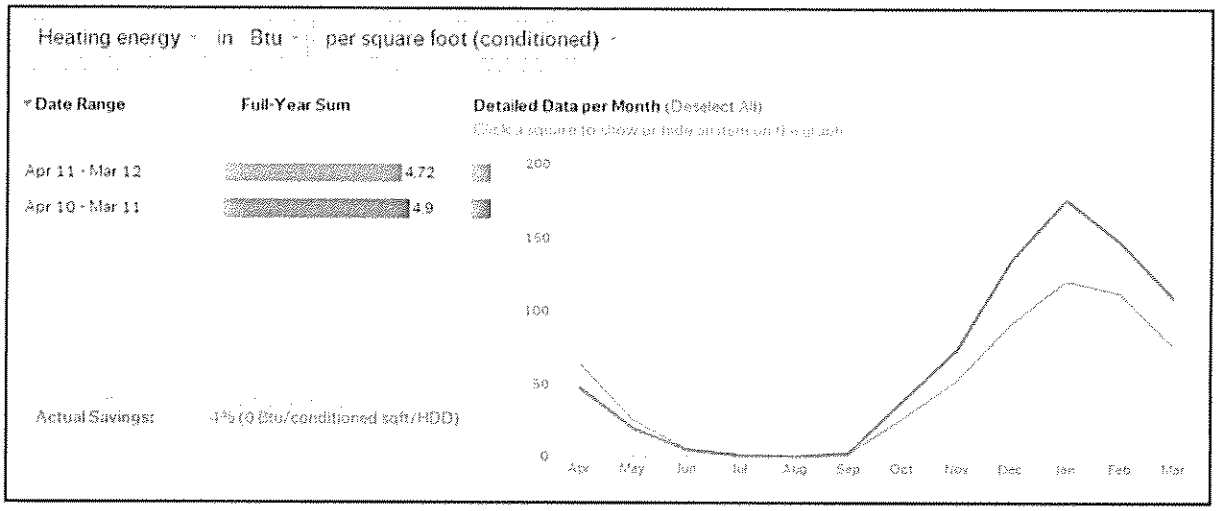
Existing Conditions

The Sierra is a mid-rise, mixed-use luxury rental building in Manhattan. Built in 2002, the 14 story building has 279 rental units and 420 bedrooms. Attached to the building is student housing for New York University and a YMCA facility. Two 191 HP Cleaver Brooks hot water boilers, models #FLX800, provide hot water for apartment space heating, by way of in-unit PTACs; DHW is made using two Aerco instantaneous heat exchangers. Of the total 343,534 square feet on the property, the central boiler plant supplies hot water for both The Sierra and the NYU dormitories, a total of 277,947 square feet of conditioned space.

Energy Indices

Heating Energy, or Heating Slope, is a common indicator used to demonstrate energy consumption in a manner that is normalized for varying climate conditions. The following chart demonstrates the year-to-year change in Heating Energy at The Sierra between April 2010 and March 2012. Reported in BTUs per square foot per Heating Degree Day, this metric is an industry standard for reporting energy use in heating-dominated climates. The Sierra demonstrated a 4% reduction in Heating Energy over the reporting period, dropping from 4.9 BTU/SF/HDD to 4.72 BTU/SF/HDD. These savings can be seen as the direct result of efficiency gains in space heating equipment performance, building envelope performance, and/or O&M process improvements.

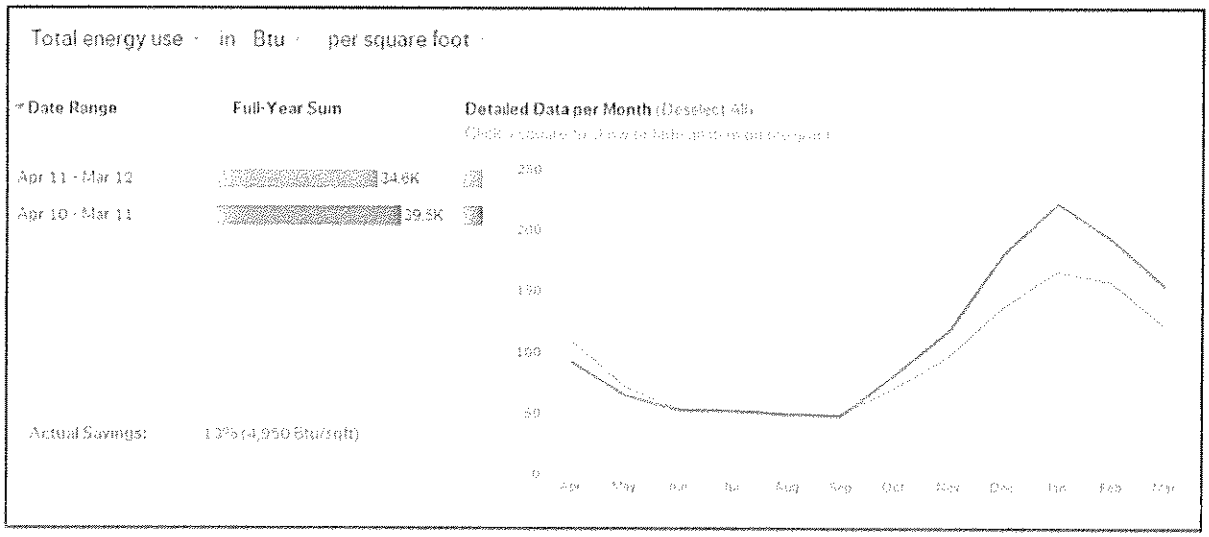
Heating Energy: BTU/SF/HDD



Total Energy Use is an indicator of the total amount of energy consumed by a building (in this case, the total energy that is paid for by the owner), typically reported in kBTU/square foot/year. The following chart demonstrates the year-to-year change in Total Energy Use at The Sierra between April 2010 and March 2012. The Sierra demonstrated a 13% reduction (39.5 kBTU/SF in 2010 to 34.6 kBTU/SF in 2011) in Total Energy Use over this two year period, which coincides with the resident manager's Green Supers Program. Note that Total Energy Use is a metric that is not reported in weather normalized terms, meaning that seasonal climate fluctuations are not captured in the data. Total Energy Use is limited for comparative purposes because it lacks weather normalization, however it remains a widely cited metric and is worthy of inclusion. The dramatic decrease in Total Energy Use reflected in the line chart below is a reflection of direct heating energy savings as well as a significantly milder winter in 2011/12.

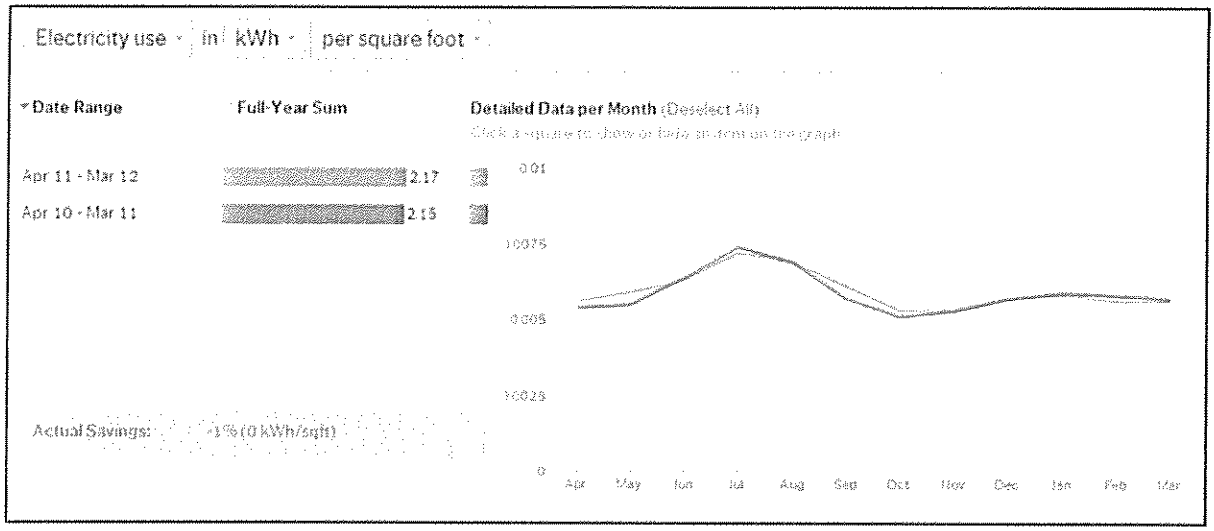
Total Energy Use can also be demonstrated in terms of carbon reduction. The Sierra realized a 10% reduction in carbon emissions over this period: 5.76 lbs. CO_2 per square foot in 2010 and 2011 to 5.19 lbs. CO_2 per square foot in 2011 and 2012, for a total annual reduction of 195,800 lbs. CO_2.

Total Energy Use: kBTU/SF



Electricity Use is an indicator of the total amount of electricity consumed by a building, typically reported in kWh/square foot/year. The following chart demonstrates the year-to-year change in common area Electricity Use at The Sierra between April 2010 and March 2012. Note that Electricity Use is a metric that is not reported in weather normalized terms, meaning that seasonal climate fluctuations are not captured in the data. The Sierra demonstrated a 1% increase in Electricity Use over this two year period. As the monthly chart below demonstrates, in 2011/12 The Sierra consumed more electric in the shoulder months of April, May, September, and October than it did in the prior reporting year of 2010/11. This is likely the result of weather conditions creating a prolonged cooling season and/or fluctuating occupancy rates. Noteworthy is that, during peak months of the summer (June, July, August) and winter (December, January, February), The Sierra performed favorably in 2011/2012 when compared to the previous year.

Electricity Use: kWh/SF



Energy Conservation Measures

The following Energy Conservation Measures were implemented at The Sierra following the training.

ECM	Annual Electric Savings (kWh)	Annual Fuel Savings (MMBtu)	Total Annual Energy Savings (MMBtu)	Estimated Annual Savings	Estimated Installed Costs	Simple Payback Period (years)	Rate of Return	SIR
HVAC/DHW Distribution Bypass & VFD Optimization	28,862	N/A	98	$5,195	$1,500	0.3	346%	69.2
Lighting Upgrade	5,116	N/A	17	$920	$2,300	2.5	40%	4.0
Air Sealing	N/A	286	286	$3,500	$14,000	4.0	25%	2.5
TOTAL	33,978	286	401	$9,615	$17,800	1.9	54%	21.6

HVAC/DHW Distribution Bypass & VFD Optimization

Building on the knowledge gained from the training in 2010/2011, an innovative strategy was implemented to reduce energy used in the production and distribution of both domestic and space heating hot water. To prevent the boiler from running excessively on warm days, and to reduce pumping energy, the resident manager installed a new bypass valve and VFD control sensor, effectively de-coupling the building's domestic hot water process pumping duties from the building's space heating pumping duties. The existing configuration for domestic hot water production utilizes Aerco instantaneous heat exchangers to create DHW, supplied with hot water from the boiler by the building's main circulator pump. On the days when space heating is not needed, a valve is engaged which manually bypasses the building loop, resulting in a dramatically smaller distribution loop between the boilers and the Aerco DHW units. This small closed loop, created by the bypass, allows the VFD on the circulator pump to dial-down when DHW is the only load for the boiler. The 25 HP circulator pump dials down to 30% capacity, or 7.5HP, representing a significant reduction in electricity, over 28,000 kWh per year. Prior to this change, the VFD on this pump was not being used to its potential. Additionally, the burner firing rates are manually dialed down to a lower setting on warm days when in DHW only mode. Taken together, these manual control improvements generate a decrease in pump power and in heating fuel consumption, and showcase effective O&M process improvements that generate real energy savings.

Lighting

Several lighting retrofits have been made that were suggested in the training. A modest retrofit to common area linear fluorescent fixtures was performed, where approximately thirty older 44W T-12 lamps were exchanged for new T-8, 32W lamps in back of the house rooms such as storage areas, maintenance rooms, and utility rooms. Task lighting retrofits, such as replacing approximately sixteen 20W MR16 halogen bulbs with 5W LEDs, were undertaken in the staff's office and the tenant business lounge on the first floor. The most substantial lighting retrofit to-date is planned for later in 2012, where the building intends to replace the 300+ light fixtures serving the corridors. The existing fixtures, 13W fluorescent pin lamps, have a total annual consumption of over 35,000 kWh with an associated cost of nearly $6,000 per year. Pending the specifics of the new product, this measure could demonstrate a savings of over 16,000 kWh per year, equivalent to 2% of total Electricity Use. At an assumed cost of $100/fixture, the simple payback on this measure will likely be in the 3-5 year range, before financial incentives.

Air Sealing

Post training, a process has been implemented to systematically address air infiltration, which was identified as a source of comfort complaints and wasted energy. Notably, a thorough air sealing package is now performed within each unit at the time of turnover. Included in this air sealing package is the sealing of PTAC penetrations and sleeve housing at the exterior wall, re-caulking of all windows, and caulking in of all baseboards throughout the unit. The effect of these air sealing measures have been anecdotally observed by building management through reduced unit-to-unit odor transfer, reduced summertime humidity levels, and an improved ability of space conditioning equipment to handle load requirements. The additional materials for air sealing represent a nominal cost increase to the turnover process, and the work can easily be performed when staff is already working in the unit. This project, conservatively, has the ability to save over $3,500 per year in heating fuel savings once implemented throughout the entire building. This process improvement is an example of how energy conservation measures may be integrated with day-to-day O&M procedures to make improvements in a highly cost effective manner.

Conclusions

The training program has led to real improvements at The Sierra, as demonstrated in the comparative charts above. O&M process improvements will take time to be fully realized financially, but the year-to-year gains in efficiency will be obvious in the future. Exposure to new technologies, such as those for corridor lighting, will generate more immediate savings when implemented in the near term. The "cultural change" that was described is an anecdotal observation suggests the effects of the training will be felt for years to come as the building pursues future energy conservation opportunities. Efforts undertaken at The Sierra paint a great picture for accumulated savings which are the result when energy conservation measures are phased-in over time with minimal disruption to "business as usual."

Green Supers Program

The Bromley — **225 West 83rd Street**

Building Characteristics

Type	Market-Rate Condo
Year Built	1987
Square Footage	459,259
Stories	23
Units / Bedrooms	310 / 401
Heating System	Steam Boilers with PTACs and Vari-Vac

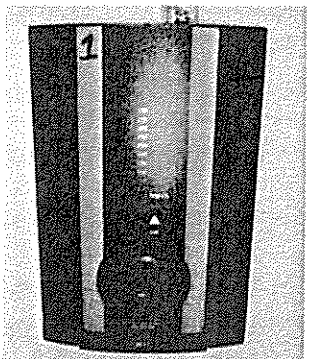
Energy Profile

Est. Heating Energy Pre	12.6 BTU/SF/HDD
Heating Energy Post	11.8 BTU/SF/HDD
Est. Total Energy Use Pre	70 kBTU/SF
Total Energy Use Post	65 kBTU/SF
Est. Electricity Pre	3.74 kWh/SF
Electricity Post	3.39 kWh/SF
Carbon Reduction	750,600 lbs. of CO_2

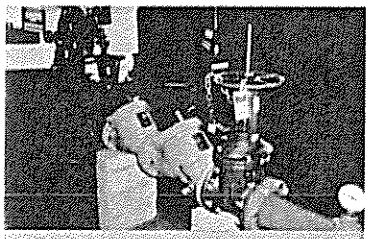
Energy Conservation Measures

Lighting Upgrades	Heating Controls/Traps
Air Sealing	Dryer Ventilation
HVAC: Garage Fans/VFD	Check Valves

Source: www.thebromley.cityrealty.com



Garage Fan CO Sensor/ VFD Control



Upgraded RPZ Check Valves

Steam Trap Upgrade

In the two years since completing training with the *Green Supers* program, resident manager Charles Hynes has maintained a steady and productive schedule of energy and water conservation retrofits, O&M improvements, and implementation of technology at The Bromley. With the support of management company Brown Harris Stevens, Hynes has implemented a rigorous program of energy conservation and sustainability-related retrofits at the building. Upgrades already executed include measures related to lighting, HVAC, pumps, domestic hot water consumption and O&M process improvements. Future upgrades being considered include additional HVAC upgrades and the evaluation of installing and combined heat and power (CHP) for on-site energy cogeneration. The Bromley is in a unique situation: its proactive and conservation-minded resident manager is paired with an engaged and supportive Condo Board. Hynes attributes his enhanced ability to communicate a conservation agenda to his Board—a group of bottom-line-driven finance and engineering professionals—to his participation in the training program. The training improved his ability to discuss energy conservation opportunities with transparency, technical proficiency, and economic savvy.

Existing Conditions

The Bromley is a luxury 23 story multifamily condominium building in Manhattan. Built in 1987, the building contains 459,259 square feet of conditioned space and a total of 310 dwelling units. Steam heat is provided to the building as produced by two #2 oil fired Cleaver-Brooks steam boilers, models #:CB100-300. Low pressure steam is distributed to apartment PTACs by way of a Vari-Vac steam distribution system. Domestic hot water is produced by immersion coils within the boiler vessels.

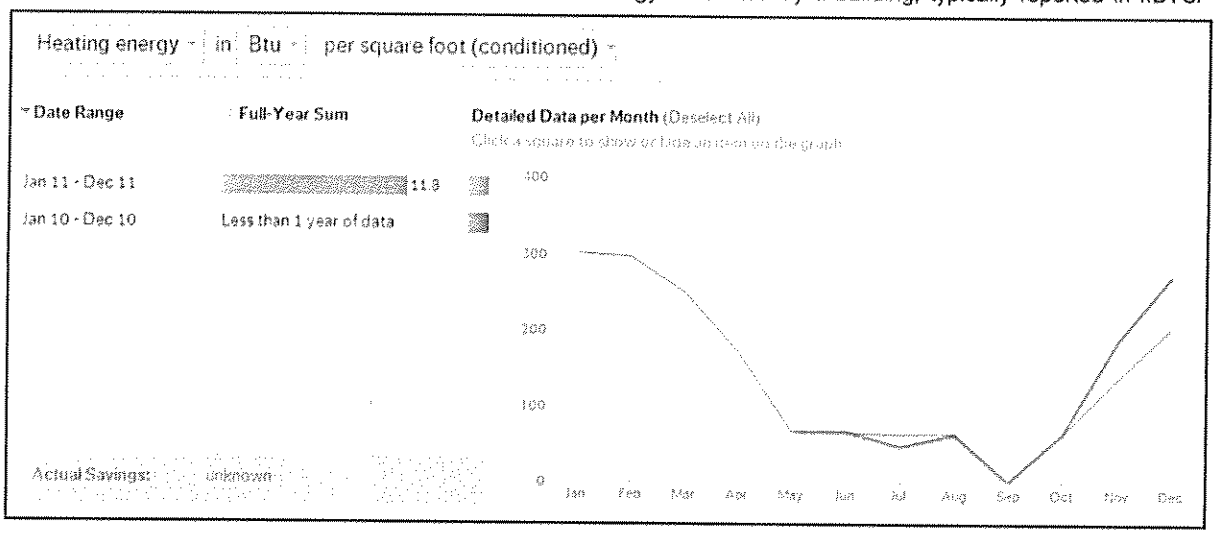
Energy Indices

Heating Energy, or Heating Slope, is a common indicator used to demonstrate energy consumption in a manner that is normalized for varying climate conditions. The following chart depicts the year-to-year change in Heating Energy at The Bromley between January 2010 and December 2011. Reported in BTUs per square foot per Heating Degree Day, this metric is an industry standard for reporting energy use in heating-dominated climates. Based on the chart below, The Bromley demonstrated a significant reduction in Heating Energy over the reporting period. An incomplete dataset from the 2010 heating season makes it difficult to quantify the precise reduction, but the chart represents a notable increase in building efficiency, likely in the 2-5% range. Savings achieved are likely a direct result of efficiency upgrades

implemented by the resident manager. The complete set of 2010 data was not available for utility consumption at The Bromley; estimates and projections of savings were made for utility consumption in the first half of 2010.

Heating Energy: BTU/SF/HDD

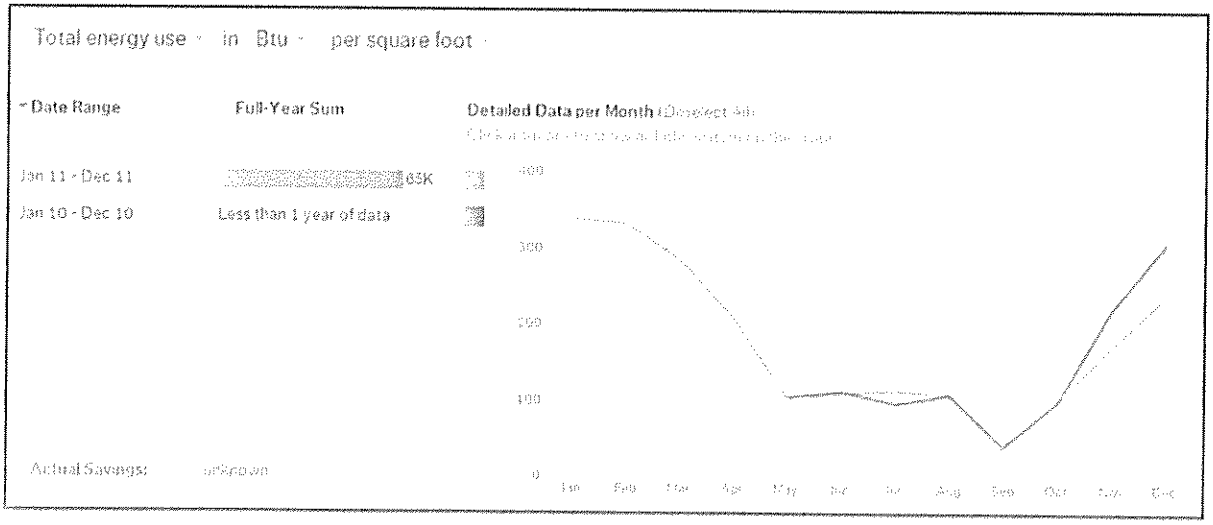
Total Energy Use is an indicator of the total amount of energy consumed by a building, typically reported in kBTU/



square foot/year. The following chart demonstrates the year-to-year change in owner paid expenses at The Bromley, represented as Total Energy Use between January 2010 and December 2011. Utility data was not available for the beginning of 2010, preventing a full comparison from being made. The chart graphics, however, suggest a reduction in Total Energy Use; the shape of the Total Energy Use curve appears to show a measureable decrease in consumption year over year. The shape of the curve matches very closely to the shape of the Heating Energy curve in the previous chart, suggesting that improved space heating efficiencies are driving a reduction in Total Energy Use and carbon emissions.

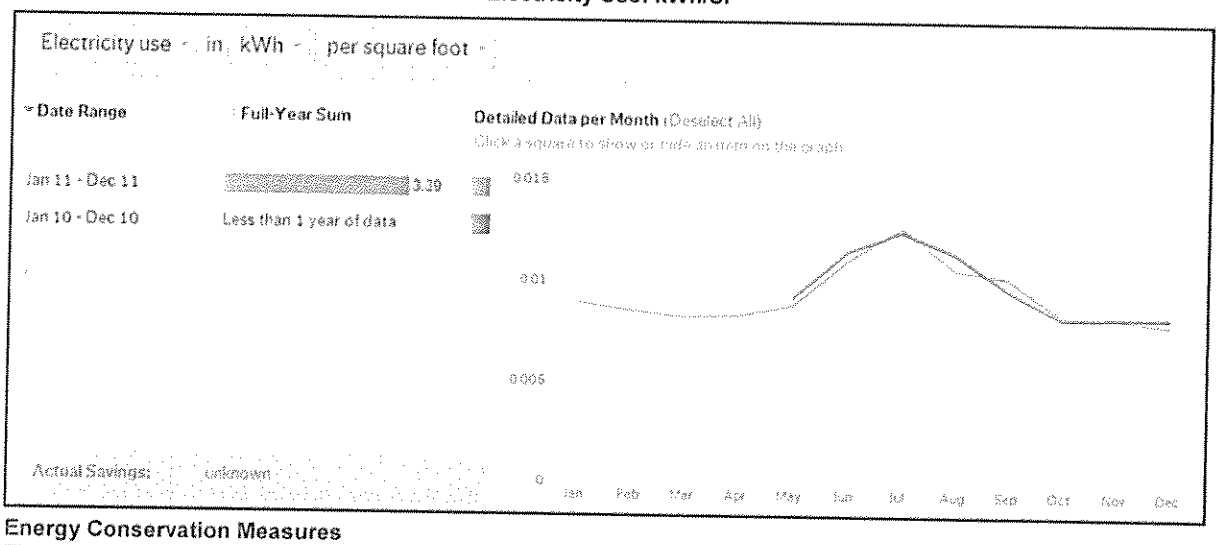
Note that Total Energy Use is a metric that is not reported in weather normalized terms, meaning that seasonal climate fluctuations are not captured in the data. Total Energy Use is limited for comparative purposes because it lacks weather normalization, however it remains a widely cited metric and is worthy of inclusion to give a sense of energy consumption in the building's common areas.

Total Energy Use: kBTU/SF



Electricity Use is an indicator of the total amount of electric consumed by a building, typically reported in kWh/square foot/year. The graph below displays the year-to-year change in Electricity Use at The Bromley between January 2010 and December 2011. Note that Electricity Use is a metric that is not typically reported in weather normalized terms for this region of the county, meaning that seasonal climate fluctuations are not captured in the data. Comparing year-to-year consumption, the monthly chart below demonstrates that The Bromley consumed less electricity in 2011 during the months of May, June, August, and December, while the building consumed slightly more electricity during July and September. The overall trend appears to be that of decreased consumption and reduced total electric use, supported by the cumulative decrease in consumption over the peak months of June, July, and August in 2011; especially noteworthy is the decreased August consumption in 2011, suggesting the savings are related to seasonal cooling load reduction rather than baseload reduction, which is supported by the installation of the new cooling tower/ variable frequency drive (VFD). Elevated consumption in the shoulder month of September may be the result of weather conditions creating a prolonged cooling season. Additional utility data collected in the future and normalized for weather conditions, would allow for a more detailed comparison over time.

Electricity Use: kWh/SF



Energy Conservation Measures

The following Energy Conservation Measures were implemented at The Bromley following the training:

ECM	Annual Electric Savings (kWh)	Total Annual Energy Savings (MMBtu)	Estimated Annual Savings	Estimated Installed Costs	Simple Payback Period (years)	Rate of Return	SIR
Lighting Upgrades	11,990	41	$2,100	$4,050	1.9	51.8%	7.7
Air Sealing	N/A	367	$2,575	$7,800	3.0	33.0%	6.6
Heating Controls: Boiler and Vacuum System Controls Upgrade to Heat Timer Platinum	N/A	1,182	$12,000	$15,000	1.3	80%	12.0
Check Valve Upgrade For Domestic water	N/A	N/A	$25,000	$40,000	1.6	62.5%	9.3
Traps: Comprehensive Main Steam Trap Replacement	N/A	169	$2,960	$9,000	3.0	32.8%	0.98

(continued) ECM	Annual Electric Savings (kWh)	Total Annual Energy Savings (MMBtu)	Estimated Annual Savings	Estimated Installed Costs	Simple Payback Period (years)	Rate of Return	SIR
HVAC: Garage Fans/VFD Cooling towers with VFD fans and condenser water pumps & integrated garage ventilation fans with carbon monoxide sensors	135,590	463	$11,600—Compared to a standard-efficiency routine upgrade	$25,000	2.1	46.4%	6.9
Dryer Ventilation: Demand-Controlled System Installation	12,476	103	$4,060	$10,000	2.5	40.6%	6.1
TOTAL	**160,056**	**2,325**	**$60,295**	**$110,850**	**1.8**	**54%**	**47.9**

Lighting/Controls
Post training, a lighting audit of the building was completed. Opportunities were identified to upgrade lighting in many common areas, such as stairwells, back of house areas, and the lobby. As a result, The Bromley opted to explore the installation of LED lighting in the stairwells to replace the existing linear fluorescent fixtures; Con Edison provided incentives which bought down the ROI of installing this new technology to a realistic 2 year payback. Motion sensors were installed where practical, such as in the compactor rooms on each of The Bromley's 23 stories; pre-retrofit, these lights were on 24 hours a day. Due to reduced operating hours and more efficient fixtures, energy savings associated with lighting system upgrades at The Bromley are estimated to be nearly 12,000 kWh and $2,000 per year.

Air Sealing
Another key source of holistic energy savings came from sealing the building envelope. Before training, the building reported notable heating and cooling inefficiencies, problems with the elevator doors, and complaints of excessive noise. Post training, a regimen of air sealing the building envelope was implemented, beginning with a program of addressing the "low-hanging fruit" first: un-weatherstripped doors were effectively gasketed, and obvious air leakage pathways to the exterior, such as plumbing and electrical penetrations, were permanently sealed with spray foam or caulk. Difficult to quantify but of specific interest was one of the managerial changes put in place: exterior doors are no longer allowed to be propped open unless absolutely required. Air sealing measures generated savings of over 3,500 therms and $2,500 per year and demonstrated a very reasonable payback of three years.

Heating Controls/Traps
Fuel used for space heating purposes is typically the most significant end-use for energy consumption in a post-war, two-pipe steam heated building such as The Bromley. Unsurprisingly, several upgrades and process improvements have been made to optimize the building's fuel consumption profile. Hynes oversaw the upgrade of the central heating control panel with the installation of a Heat Timer Platinum series panel. This new panel controls boiler operation, heating distribution (using a modulating vacuum system), and DHW with improved efficiency over the original control panel it replaced. In the last year, the building has replaced all of the main steam traps serving the two-pipe distribution system, and building management is currently reviewing and considering a conversion from #2 oil to natural gas. Combined savings from these heating control and distribution upgrades are estimated to be over 13,500 therms and nearly $15,000 per year.

Check Valve Upgrade for Domestic Water
With guidance from the training instructor, the resident manager at The Bromley diagnosed and repaired a major source of wasted water: failing domestic water check valves. The previously installed check valves failed constantly in their duty, allowing a 23-story tall, 8" column of domestic water to discharge from the building several times a day. The Bromley was billed twice for this unused water in the form of water bills and sewer fees. The resident manager was

made aware of the RPZ technology during his training and again moved quickly, with the support of his Board, to replace the aging units. Although consumption data and installed costs were not made available (estimates taken from RS Means were used), the expectation is that annual savings will be measured in the tens of thousands, both in terms of gallons of water and bottom-line dollars. According to the resident manager, this capital upgrade has generated a "32% savings" in water and sewer bills, with a simple payback on this measure estimated to be around 18 months.

HVAC: Garage Fans/Variable Frequency Drive

A major capital project was undertaken at The Bromley with the replacement of the basement cooling towers. The resident manager at the building, in concert with the design engineers for the new system, took this unique capital opportunity to integrate a demand-controlled garage ventilation system into the new cooling tower fans, simultaneously eliminating the existing garage exhaust fans. The system, governed by VFD and controlled by garage-mounted CO sensors, allows the cooling tower fans to provide for garage exhaust when the demand (i.e., CO concentrations) requires. The fans utilize the VFD to ramp-up slowly and stage into duty in response to actual load conditions. The effective result was the elimination of two continuously operating exhaust fans and improved control capabilities, yielding considerable electric savings. According to the resident manager, as a result of this retrofit, "five months of the year (the fans) run at 60%, six months of the year they run at 35%, and one month of the year they are running at 100% due to outside hot weather." Associated energy savings are over 135,000 kWh per year.

Dryer Ventilation

In addition to the newly installed cooling towers equipped with a VFD control package, the resident manager installed thermostatic controls on the clothes dryer exhaust fan in an effort to reduce energy consumption when the laundry services are not in use. Prior to this effort, the rooftop exhaust fan which drives dryer operation was running continuously, 24/7, drawing conditioned air from the building cavity and wasting massive amounts of energy in the process. This measure was rather easy to implement and had a significant impact on electrical savings. The associated reduction in electricity for fan consumption is approximately 12,500 kWh and the associated heating fuel reduction is about 1,030 therms per year.

O&M Process Improvement

Perhaps the most significant impact on energy consumption that can be attributed to the training lies in improved management and maintenance practices. The resident manager reported an exceptional improvement in his attention to O&M issues, including a renewed effort to monitor systems performance and log pertinent data—the result of specific focus in the trainings. The institution of a paperless smartphone application to monitor and track daily systems logs has streamlined O&M processes and has been received with tremendous buy-in from other members of the building staff (handymen, etc.). The resident manager described the trickle-down effect that his elevated interest in O&M process improvements has had amongst his staff, which has led to an overall advancement in their collective skill sets. The entire staff is, today, more proactive in their approach toward identifying and addressing maintenance issues that would have otherwise festered and grown into more costly repairs. Overall, the savings which might be attributed to O&M process improvements are difficult to quantify, but they may have the most far-reaching impact that can be tied to the *Green Supers program.*

Another newfound understanding of conservation and sustainability has been applied to the management of The Bromley, embracing operations and maintenance changes that will allow positive effects to accumulate over time. For example, the new green recycling program capitalizes on an outreach program with the Home Depot. Bromley residents are prompted to recycle their light bulbs and batteries in the two common area receptacles, which are then picked up by the Home Depot and delivered to a recycling plant. The Bromley is also making strides towards going paperless in their billing and resident outreach efforts, which will make a substantial difference in a building of 310 units. Using a new software package, building management and residents cut down on correspondences that usually occur on paper (rent notices, package slips, work orders, bulletin postings, building directories etc.) and digitize them into a compact and mobile application for computers and smartphones.

Conclusions

The Bromley is a case study in how to implement a capital plan that is financially prudent while being cognizant of energy and sustainability issues. Driven largely by the resident manger's influence and an understanding of the potential for volatility in the energy sector, The Bromley has developed an understanding of the long-term benefits of a proactive conservation program. They have leveraged incentive programs and cutting edge technologies to off-set the cost of capital intensive projects, which would have needed to be future considerations. Beyond the measures listed above, which have already been implemented, building management is also considering a plan to upgrade to natural gas and install combined heat and power (CHP), as well as pursuing additional HVAC upgrade opportunities.

The Vaux

372 Central Park West

Building Characteristics

Type	Market-Rate Condo
Year Built	1961
Square Footage	323,725
Stories	19
Units / Bedrooms	392 / 753
Heating System	Steam Boilers / 2 pipe steam

Energy Profile

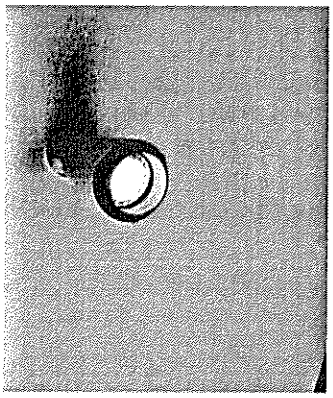
Heating Energy Pre	10.9 BTU/SF/HDD
Heating Energy Post	9.62 BTU/SF/HDD
Total Energy Use Pre	78 kBTU/SF
Total Energy Use Post	68.9 kBTU/SF
Electricity Pre	2.04 kWh/SF
Electricity Post	2.06 kWh/SF
Carbon Reduction	517,960 lbs. CO_2

Energy Conservation Measures

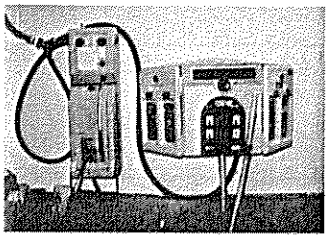
Lighting Upgrades

Weather Stripping

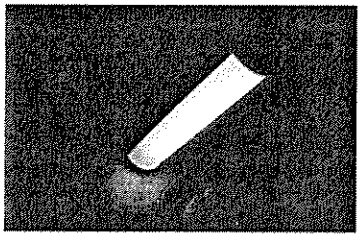
Regular Boiler Cleaning and Monitoring



Newly updated LED lighting fixture in lobby



Green cleaning products station



Stairwell lighting replacement from T12 to T8 bulbs

The immediate period following the training, Luis Rivera, the resident manager at The Vaux, accomplished a program of executing whole-building energy efficiency measures. Substantial lighting retrofits were made, including upgraded fixtures and controls. Building envelope improvements, such as the weatherstripping of exterior doors, were integrated into the building's O&M plan as a means of reducing heating loads. Energy reduction measures and operations and maintenance strategies were also pursued that encompass green cleaning and a newly developed HVAC preventative maintenance plan. Significant energy savings can be correlated with these process improvements.

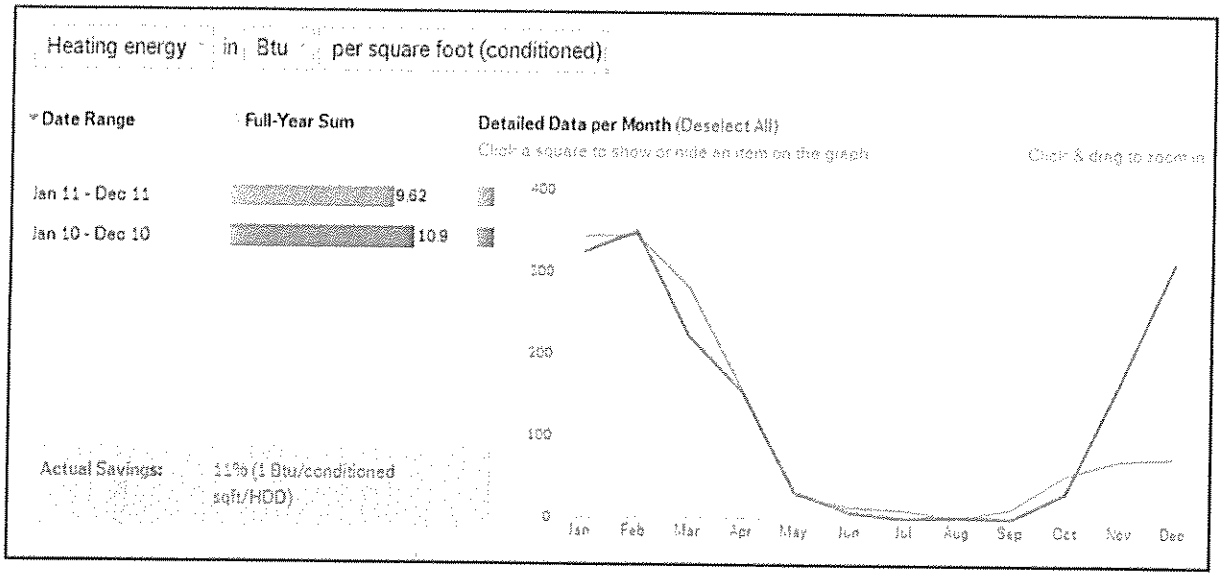
Existing Conditions

The Vaux is a high rise building in Manhattan. Built in 1961, the 19 story building has 392 units. Two steel firebox horizontal firetube boilers utilize #6 fuel oil to provide for the building's space heating and domestic hot water requirements. The boilers were installed in 1997; one boiler's heating coils were replaced in 2009.

Energy Indices

Heating Energy, or Heating Slope, is a common indicator used to demonstrate energy consumption in a manner that is normalized for varying climate conditions. The following chart demonstrates the year-to-year change in Heating Energy at The Vaux between January 2010 and December 2011. Reported in BTUs per square foot per Heating Degree Day, this metric is an industry standard for reporting energy use in heating dominated climates. The Vaux demonstrated an 11% reduction in Heating Energy over the reporting period, dropping from 10.9 BTU/SF/HDD to 9.6 BTU/SF/HDD. These savings can be seen as the direct result of efficiency gains in space heating equipment performance, building envelope performance, and O&M process improvements. A large percentage of these savings can be attributed to the new program of monitoring and better maintaining the building's central heating plant.

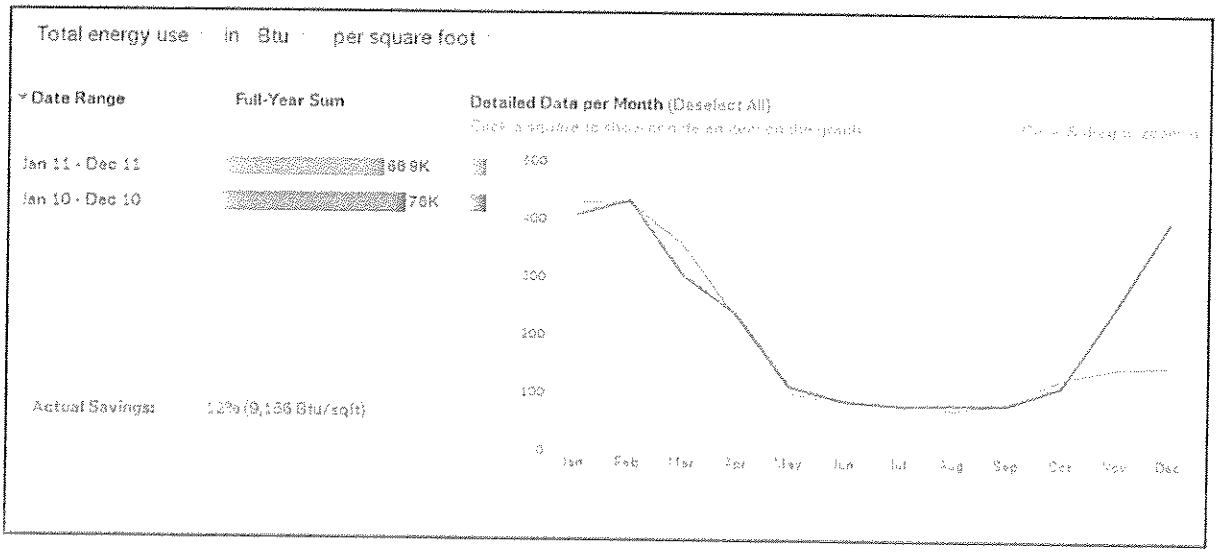
Heating Energy: BTU/SF/HDD



Total Energy Use is an indicator of the total amount of energy consumed by a building (in this case, the total energy that is paid for by the owner), typically reported in kBTU/square foot/year. The following chart demonstrates the year-to-year change in Total Energy Use at The Vaux between January 2010 and December 2011. The Vaux demonstrated a 12% reduction (78 kBTU/SF in 2010 to 68.9 kBTU/SF in 2011) in Total Energy Use over this two year period, which coincides with the resident manager's training program. Note that Total Energy Use is a metric that is not reported in weather normalized terms, meaning that seasonal climate fluctuations are not captured in the data. Total Energy Use is limited for comparative purposes because it lacks weather normalization, however it remains a widely cited metric and is worthy of inclusion. The dramatic decrease in Total Energy Use reflected in the line chart below is a reflection of direct heating energy savings as well as a significantly milder winter in 2011 and 2012.

Total Energy Use can also be demonstrated in terms of carbon reduction. The Vaux realized a 11% reduction in carbon emissions over this period: 14.1 lbs. CO_2 per square foot in 2010 to 12.5 lbs. CO_2 per square foot in 2011, for a total annual reduction of 517,960 lbs. CO_2.

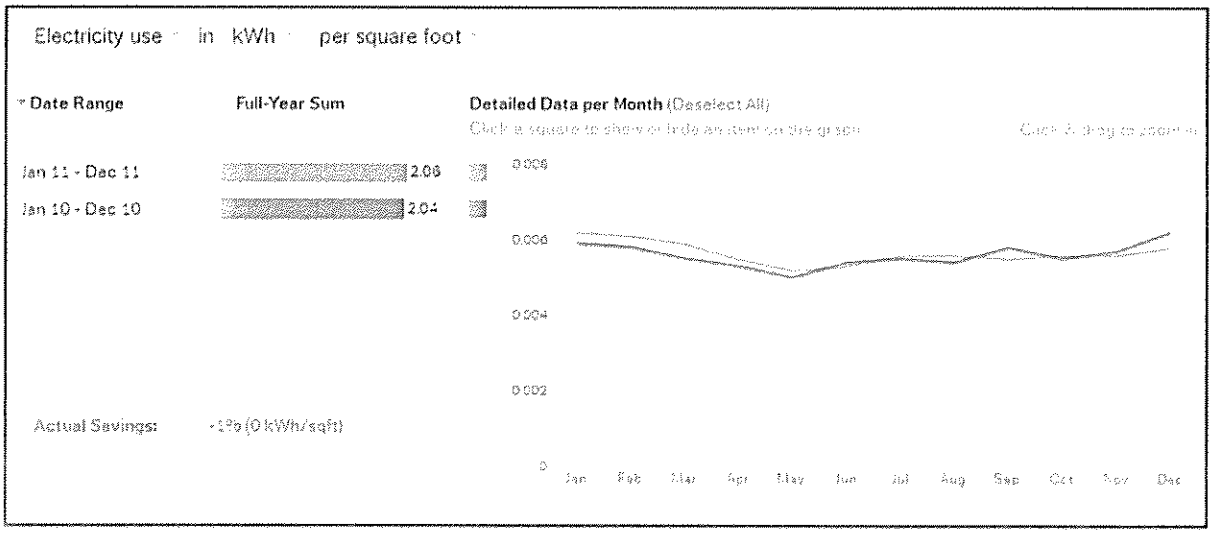
Total Energy Use: kBTU/SF



Electricity Use is an indicator of the total amount of electricity consumed by a building, typically reported in kWh/square foot/year. The following chart demonstrates the year-to-year change in common area Electricity Use at The Vaux between January 2010 and December 2011. Note that Electricity Use is a metric that is not reported in weather normalized terms, meaning that seasonal climate fluctuations are not captured in the data. Since New York City is a cold climate, heating energy is more dominant than summer cooling, therefore winter months typically govern space conditioning requirements; data is frequently analyzed in terms of HDD not CDD.

The Vaux demonstrated a relatively flat consumption profile in Electricity Use over this two year period, meaning there was no discernible change in consumption visible in this data set. It is important to note the lighting retrofit work was done within the last eight months of the reporting period, and savings are likely to accrue over time. The data suggests, however, a flattening of electricity use starting in September 2011; the 12 month slope for 2011 shows a trend of gradually decreasing consumption from the beginning to the end of the year, in contrast to the 12 month slope for 2010. The anticipated reduction to electric consumption generated by the lighting upgrade (described below) projects to a reduction of 0.16 kWh/SF, or around 7% of annual common area consumption. Key unknown variables, such as weather and occupancy rates, combined with the reduced 8 month sample set of post-retrofit data to mute this 7% reduction from being fully visible through utility analysis. It should be anticipated that this savings would be more apparent in an analysis of the 2012 calendar year.

Electricity Use: kWh/SF



Appendix B – Isolated Energy Conservation Measure Case Studies

Energy Conservation Measures
The following Energy Conservation Measures were implemented at The Vaux following the training:

ECM	Annual Electric Savings (kWh)	Annual Fuel Savings (MMBtu)	Total Annual Energy Savings (MMBtu)	Estimated Annual Savings ($)	Estimated Installed Costs	Simple Payback Period (years)	Rate of Return	SIR
Periodic Boiler Cleaning	N/A	2,601	2,601	$43,900	$7,200	0.2	609%	3.05
Entrance Door Weather Stripping	N/A	0.42	0.42	$10	$80	8	12.5%	1.25
Lighting Upgrades	52,814	N/A	180	$9,500	$32,000	4.1	29.6%	2.96
Total	**52,814**	**2,601**	**2,781**	**$53,410**	**$39,280**	**0.7**	**136%**	**27.9**

Boiler Cleaning and Monitoring
Following participation in the *Green Supers* program, the resident manager began to investigate the boilers' stack temperatures and their relationship to system performance. The resident manager monitored stack temperatures in a previous building he worked in, but realized they were not being monitored in The Vaux. Accordingly, stack temperature gauges were installed on the boilers and temperatures were observed to be over 600 °F, notably high even for #6 oil. The resident manager immediately implemented a program of periodic boiler cleaning by a third party contractor (roughly every six months, or as needed based on increased temperatures) and daily recording of temperatures, water usage, and oil levels, representing the most significant change to boiler maintenance practices in over a decade.

A 10% heating fuel reduction is shockingly high for the institution of a maintenance program, and should be considered atypical. Other factors may contribute to these significant savings. For example, the mild winter temperatures of 2011 may have resulted in less manual manipulation of the Vari-Vac system valve by the resident manager due to a lack of extremely cold temperatures, reducing the need for extra heat on particularly cold days, and occupancy rates may have dropped, resulting in reduced DHW loads. However, a boiler that utilizes #6 oil and has not been properly maintained will see dramatically inhibited heat transfer and excessively high stack temperatures, as was the case at The Vaux. Upon completion of the first major servicing to the heating plant, stack temperatures were reduced from 600 °F to a more typical temperature of 350 °F, where they have since been maintained through the new O&M program. It is estimated that combustion efficiency was improved during the first clean and tune from approximately 78% to approximately 88.5%, accounting for the dramatic savings that were realized for both space heating and DHW end uses.

Lighting Upgrades
Nearly every common area within the building underwent a lighting upgrade following the training program. The building's residential corridors, starting at the second floor, already utilized low wattage CFL lamps throughout. The stairwell, lobby, first floor corridors, basement corridor, and resident laundry all were upgraded. The four stairwells, originally contained one F20 fluorescent lamp per floor with magnetic ballasts. These lamps were replaced in-house, incrementally over an 8 month period, with bi-level fixtures containing two 17 watt T8 lamps with electronic ballasts. These new fixtures only operate at full capacity when motion sensors detect activity in the stairwell.

The lobby's halogen lamps were replaced with low wattage LED equivalents to illuminate a space which is lit continuously. The first floor corridors originally contained fixtures utilizing three screw-in base incandescent lamps. These fixtures now utilize two 7 watt CFL lamps. The basement corridors and laundry room had its T12 fluorescent lamps with magnetic ballasts replaced by lower wattage T8 lamps with electronic ballasts. Finally, the laundry room's lighting was connect to a motion sensor to cut the lights when the room is not in use, and a bicycle storage room had a door switch installed to ensure that the lights are off when the room is vacant.

As referenced earlier, the anticipated reduction of nearly 53,000 kWh/year represents a savings of approximately 7% of common area electric consumption.

Entrance Door Weatherstripping
The resident manager added weatherstripping at the front and rear entrance doors to the lobby. The existing glass double doors contained large gaps where the doors meet and at the hinge-side of the doors. Having improved the building's O&M practices, the resident manager now monitors the condition of the weatherstripping and replaces it as necessary. Savings related to these weatherstripping improvements are modest but demonstrate the efficacy of integrated energy conservation into a building's O&M program.

Green Cleaning
Additionally, the resident manager implemented a green cleaning program by switching out the traditional cleaning supplies with Betco Green Earth cleaning products, which are dispensed from a central "Fast Draw 4" dispenser. These floor cleaners, degreasers, and general cleaning products aim to reduce waste and environmental damage during production, and minimize the negative impacts on indoor air quality, positively impacting building staff and resident health. Although not a true energy conservation measure, the installation of this mixing station will likely be cost effective in the long term through reduced purchase of bottled cleaning products.

Conclusions
The energy conservation upgrades enacted at The Vaux show that a cost effective sustainability program can be rolled out without the requirement of a major capital expenditure. The implementation of a lighting retrofit program should show cost effective reductions to baseline electric consumption, as lighting accounts for a substantial portion of whole-building energy expenses in this modern condominium. The fuel energy savings demonstrate the substantial benefits resulting from ongoing maintenance and monitoring of a building's heating plant. These savings also underscore how the training can have an immediate impact on both bottom line energy consumption and environmental issues. The training explicitly demonstrated that a different boiler service protocol should be in place. Acting quickly on this new knowledge, the super made a relatively minor process change and began to reap immediate and substantial energy savings through improved combustion efficiency, as the large boilers fire for heat and DHW throughout the entire year. Accounting for the environmental impact of reduced emissions from #6 fuel oil, this simple O&M process improvement is one of the most impactful changes that has been the direct result of this program.

Buildings highlighted
- 130 West 15th Street/The Sierra
- 215 West 91st Street/The De Soto
- 200 E. 32nd Street/The Future

One aspect of the *Green Supers* Program curriculum covers the fundamentals of building science and aspects of air movement, within the building envelope and to the outside. As a result of this training module, air sealing was a common strategy employed by several of the resident mangers and supers as an effective energy conservation measure to reduce uncontrolled airflow through buildings.

Unchecked air infiltration is linked to a wide range of building performance problems, including poor indoor air quality (IAQ), mold growth, ventilation system performance problems, heat loss, and occupant discomfort. In typical multifamily buildings, heat loss due to infiltration is roughly comparable to the combined impacts of conductive and radiative heat loss through wall, window and roof surfaces. Infiltration is driven by the varying and combined forces of stack effect, wind effect, and mechanical pressurization. Various research reports, such as the "There are Holes in Our Walls" study (conducted by Steven Winter Associates, prepared by Urban Green Council, April 2011), suggest that reducing infiltration represents an excellent opportunity to reduce whole-building energy consumption. Air sealing reduces infiltration by permanently sealing air leakage pathways. Focused air sealing efforts should concentrate on the following locations: the top of the building envelope, at the high pressure plane; the bottom of the building envelope, at the low pressure plane; compartmentalizing contaminant source locations, such as garages and boiler rooms; horizontal air leakage pathways across the building envelope; interior and exterior doors; and windows.

From both an energy and an IAQ standpoint, reducing holes between units and sealing interior air leakage pathways, such as vertical and horizontal service chases and stairwell doors (even if they are not directly to the outside) is critical to effectively "compartmentalize" apartments and minimizing the uncontrolled movement of air through the building.

Onsite M&V Plan

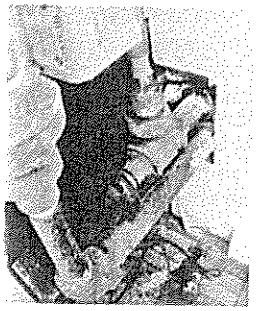
Several buildings where on-site management executed successful air sealing retrofits were visited for the purpose of evaluating the specific installed measures. Taken in concert with superintendent interviews, the specific ECMs in this study required visual inspections and observation of system functionality to verify performance. Furthermore, apartment blower door testing has been conducted at multifamily buildings outside of this study and provides a foundation for infiltration reductions that result from in-unit air sealing measures.

Air Sealing of PTACs

The Sierra						
ECM	Estimated Electric Savings (kWh)	Estimated Fuel Savings (MMBtu)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
Air Sealing	N/A	286	286	$3,500	$14,000	4.0

Two different but notable best practice air sealing measures were implemented at Related Management's The Sierra, located at 130 West 15th Street, and at Douglas Elliman's The DeSoto on West 91st Street, both in Manhattan.

The Sierra has integrated, as a standard O&M practice, the sealing of plumbing and electrical penetrations at all of the hot water Packaged Terminal Air Conditioner (PTACs) units in each apartment. Implementation of the measure is ongoing; the building staff addresses PTAC sealing at every apartment turnover period, and during in-unit service calls.



Unsealed PTAC pipe penetrations

PTAC penetrations effectively sealed with spray foam

Air sealing in and around the PTACs, in combination with other O&M process improvements, has resulted in a 4% heating energy savings per Btu per square foot from 2010 to present. Annual heating fuel savings related to this measure are approximately $3,500/year.

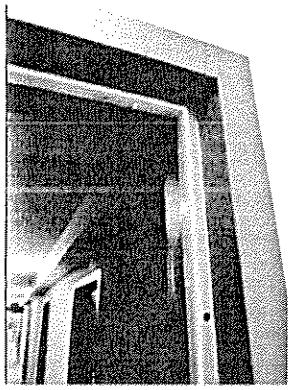
Air sealing practices were executed by several other graduates of the *Green Supers* Program on in-unit HVAC systems. The Future Condominiums, a high-rise residential tower located at 200 E. 32nd Street, saw a dramatic reduction in heating energy due to the installation and proper air sealing around new, more energy efficient Packaged Terminal Heat Pumps (PTHPs) in the apartments. The new PTHP models form a tight fit with the wall penetration since gaskets around them are not worn from years of service; the result is a more airtight seal. Additionally, urethane spray foam was used to air seal the electrical penetrations, ensuring there were no gaps to the outside. This is an example of how envelope tightening measures can be integrated within the design of a new mechanical system. Blower door testing data suggests that in-unit air change rates can be reduced by 5-7% through effectively sealing around PTAC/ PTHPs.

Weatherstrip Doors

The DeSoto

ECM	Estimated Electric Savings (kWh)	Estimated Fuel Savings (MMBtu)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
Weatherstrip Doors	N/A	32	32	$450	$600	1.3

Maintenance staff at The DeSoto, located at 215 W 91st Street, implemented another air sealing practice, sealing six exterior access doors on the top and bottom of the building with weatherstripping. This measure resulted in annual energy savings of approximately $75 per door, for a total of $450. Often times, weatherstripping doors can take several years to payback when performed by an outside contractor, with prices as high as $250 per door. When performed in-house by a trained staff, however, the cost-benefit becomes significantly more attractive, with material costs of approximately $50 and approximately 30 minutes of staff labor required per door.



Proper weatherstripping on an access door

Conclusions

Several of the training participants referenced a new-found respect for the indoor air quality and comfort issues associated with uncontrolled air infiltration. High air change rates in the summertime draws large volumes of moisture-rich outside air into a building. One resident manager that was interviewed discussed how his decision to implement PTAC air sealing as a standard practice had as much to do with IAQ as with energy consumption. A situation was described where the humidity levels were so high in the building during the summer months that the HVAC systems could not keep acceptable comfort levels, and many residents complained. The systematic air sealing approach which was implemented to combat this problem has substantially improved indoor climate conditions, with the frequency of comfort complaints greatly dropping since the program was enacted. Reducing the uncontrolled movement of air through a building also minimizes the transfer of smells, pollutants, noise, pests and smoke between units. While large-scale air sealing projects are often capital intensive, the training program sparked a desire in many of the participants to begin implementing low-cost air sealing techniques which could be integrated within daily operating procedures. These in-house air sealing measures are cost effective and highly beneficial in combatting infiltration problems. Research conducted on infiltration rates in multifamily buildings, such as the "There are Holes in Our Walls" study, demonstrates that every square inch of exterior air leakage that can be effectively sealed will yield $5-$8 of energy savings. Air sealing is an effective measure because it improves building performance problems and indoor air quality, while generating tangible energy savings.

Buildings highlighted

- 525 West 23rd Street/The Tate
- 15 William Street/William Beaver House
- 130 West 15th Street/The Sierra

Superintendents and resident managers who graduate from the *Green Supers* program often undertake lighting improvements as one of their first energy conservation projects. Of the ECMs covered in training, lighting is commonly the building system most readily understood by decision makers on condo/co-op boards and property management companies. Additionally, ROI on lighting upgrades are subject to relatively few operating and installation variables that might adversely impact performance.

Energy conservation opportunities related to lighting typically focus on, but are not limited to, the following components:

- Upgrading to more efficient lamps
- Upgrading to more efficient ballasts
- De-lamping overlit spaces
- Upgrading controls (i.e., occupancy and vacancy sensors, motion sensors, timers, astronomical clocks, daylight harvesting, etc.)
- Adjusting building operating schedules

Specific areas of opportunity include: general common area lighting (i.e., corridors, stairwells), common area task and spot lighting, back-of-house lighting, exterior lighting, accent and ambiance lighting, and decorative lighting. Superintendent and resident manager feedback on the lighting component of the training program was overwhelmingly positive. The experiential show-and-tell nature of the lighting component was highly engaging, and several supers called out their lighting demonstrators by name as particularly accessible, knowledgeable, and down-to-earth experts.

Onsite M&V Plan

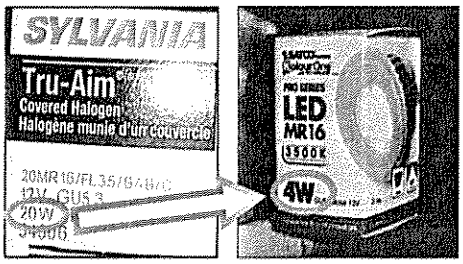
Lighting retrofits lend themselves to verification by way of visual inspections and utility analyses. Often times the relatively minor scope of a lighting retrofit prevents the energy savings from being accurately depicted in the electric bills. Visual inspections and superintendent interviews were the primary methods employed in verifying the installation of these lighting technologies and to document performance improvements.

Upgraded Lamps & Ballasts

The Tate					
ECM	Estimated Electric Savings (kWh)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
(94) MR16 halogen lamps replaced with LEDs	19,361	66	$3,500	$2,500	0.71
Replace T12/magnetic ballast with T8/electronic ballast (per fixture)	185 (per typical 48" fixture)	0.63	$35	$100	2.8

The replacement of halogen MR16 lamps with LED replacements is a measure that was pursued at both The Tate and The Sierra, two properties owned and managed by Related Companies. These fixtures are widely used for spotlighting, task lighting, and accent lighting, and represent an extremely cost effective retrofit opportunity. Assuming the existing fixture has a common 20W halogen MR16 lamp, the 4W LED replacement will typically save around 140 kWh and $25 per year, while often showing a payback of around 12 months. Supers who graduated from the program described being specifically educated on this opportunity.

The Tate reported savings of over 19,000 kWh and around $3,500 per year by upgrading their MR16 fixtures to these LED lamps. An added benefit of this upgrade is the impact that the retrofit has on O&M. The LED lamps have a considerably longer life cycle, freeing up maintenance staff time, which might have otherwise been spent replacing burnt out light bulbs. The longer life of these LED lamps can save a building dozens of man hours per week.



Lower wattage LED light bulbs can produce light output comparable to that of higher wattage halogen lamps.

De-Lamping

The Tate					
ECM	Estimated Electric Savings (kWh)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
De-lamping	4,835	16.5	$870	$800	0.92

Several other specific lighting measures have been reported as highly effective. A common retrofit is an upgrade from T-12 lamps with magnetic ballasts to T-8 lamps with electronic ballasts. Supers can often undertake this retrofit in-house, and condo/Co-op boards and management companies are willing to green light this measure more than others because of its relatively non-invasive and low-risk nature, coupled with potentially high savings and tenable ROI. Graduates of the program reported a heightened awareness of the many options available in T-8 lighting, learning that all products are not created equal. Several reported that the best option for certain spaces within their particular building would have been a high-efficiency T-8 with a low ballast-factor (0.7 to 0.75), provided high foot candle intensity was not a requirement.

In keeping with a heightened awareness of lighting-related energy waste, the resident manager at The Tate, located at 535 West 23rd Street, recognized that the boiler room was being wastefully over lit. An upgrade was made to replace the existing 2-lamp 48" T-8 fixtures with models that only have 1-lamp, effectively halving the amount of electricity required to illuminate the space. Energy savings related to this measure are over 4,800 kWh and over $870 per year. This is an example of how the training equipped a resident manager with the ability to recognize a common sense opportunity that he was not previously aware of. The practice of eliminating the use of multiple lamps and cutting back lumens in overlit areas were mentioned by several of the supers interviewed.

Occupancy and Motion Sensors

William Beaver					
ECM	Estimated Electric Savings (kWh)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
Motion sensors	57,186	195	$10,295	$880	0.1

Many supers reported that the training increased their awareness of sources of lighting energy waste and equipped them with the tools to address the problems. An easy issue for them to address is 24 hour/day lighting in seldom occupied spaces. Supers have installed motion sensors on lights in fitness centers, parking garages, compactor and recycling rooms, stairwells, outdoor areas and especially in back-of-house spaces.

Though some fixtures are left on 24 hours/day for safety purposes, supers will often put sensors on half of the fixtures in a given space, reducing energy consumption by up to 50%. The installation of motion sensors on a typical 32W T-8 linear fluorescent fixture proves a highly cost effective measure; as installed at William Beaver House, located at 15 William Street. This upgraded control feature reduced operating hours in many areas by over 75%, including the parking garage. The scale of this reduction, achievable at many back-of-house and common areas where these T-8 fixtures are prevalent, will typically yield savings of around 210 kWh and $35 per fixture.

Conclusions

The three buildings that were highlighted in this case study demonstrate that there are multiple different ways to incorporate improved lighting technologies that will save energy in a cost effective manner. Lighting upgrades represent a significant opportunity for lowering energy consumption. Because they are systems that are tangibly seen and used by the non-technical general public, lighting upgrades are one of the easiest energy conservation projects for a superintendent to propose and implement (as opposed to a ventilation or pump upgrade, which can be more difficult for decision makers to understand).

Several graduates also provided specific feedback on the curriculum as it pertains to qualitative lighting choices. High efficiency lighting options often face the stigma of projecting an undesirable color palette; many compact fluorescent and LED lamps are described as having a "cold" color temperature, which is unattractive to residents and can work against the logic of executing an upgrade. The training went in-depth on the appropriate color temperature for different applications, which enhances the super's ability to effectively implement a lighting upgrade that is both cost effective and aesthetically pleasing. Many supers provided feedback on how this particular section of the training curriculum was one of the strongest, and that it has given them an enhanced toolset for planning future upgrades. The post war stock of multifamily housing in NYC, specifically, is characterized by elevated lighting intensities, and opportunities to modernize older systems in this sector of the built environment are widespread. Superintendents who went through this program feel confident in their ability to perform a more accurate and thorough lighting survey, and to independently make recommendations that will prove cost effective. The ability to execute a rigorous lighting survey and retrofit program with in-house staff dramatically saves on the expense related to hiring an outside contractor, generating bottom line financial savings.

Buildings highlighted

- 33 Greenwich Avenue/ The St. Germaine
- 300 East 59th Street/The Landmark
- 225 West 83rd Street/The Bromley
- 201 East 80th Street
- 525 West 23rd Street/The Tate
- Midtown East Side Building

Space heating requirements dominate the energy consumption profile for the majority of New York City multifamily buildings. This reality requires a high priority to be placed on energy conservation opportunities related to improving the performance of space heating and ventilation systems, both of which have a substantial impact on heating load requirements. Energy conservation opportunities related to HVAC typically focus on the following components: central plant production of the space heating medium; distribution of the space heating medium; control protocols for the operation of the space heating system; provision of make-up air for dwelling units; capacity and volume flow rates of major ventilation systems; operation of pumps; production and distribution of the centralized space cooling medium; operation of ancillary HVAC equipment; and building operating schedules.

Much of the energy saving retrofit work performed on HVAC systems falls under the classification of a capital expenditure, as energy conservation measures of this magnitude are often integrated at the time of a major system repair or replacement. Of the graduates interviewed, several mentioned executing relatively low-cost system upgrades, while others cited larger, more costly HVAC work, resulting in considerable whole-building energy savings. The *Green Supers* program provided many of the building operators with an enhanced understanding of opportunities for energy efficiency upgrades and improved O&M practices, many of which were employed.

Onsite M&V Plan

In buildings where management and staff executed successful energy conservation retrofits, a site visit was conducted for the purpose of measuring and verifying the implemented work. Taken in concert with superintendent interviews, the specific ECMs in this study required visual inspections, observation of system functionality, and infrared thermography to verify the effective installation and performance of each measure.

Garage Ventilation Upgrade

The Bromley

ECM	Estimated Electric Savings (kWh)	Estimated Fuel Savings (MMBtu)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
Garage Ventilation	64,800	N/A	64,800	$11,650	$25,000	2.14

Pushing the boundaries of innovation, the resident manager at The Bromley, 225 West 83rd Street, installed several energy conservation measures relative to the building's ventilation systems. An upgraded garage ventilation system was implemented, demand controlled by Carbon Monoxide sensors. A ventilation system must run in order to exhaust harmful pollutants, including carbon monoxide (CO), from the garage; this system eliminated the existing 5 HP exhaust fans and integrated the garage exhaust with recently upgraded cooling tower fans. This comprehensive system utilizes variable frequency drive (VFD) technology to closely match exhaust fan performance with demand requirements. The effective result of eliminating the two continuously operating exhaust fans and improving the control capabilities yielded considerable electric savings. This resident manager engaged with the design team, as well as the instructors from the training course, throughout the project to ensure that system design and installation would be optimized to meet the building's needs.

VFD for garage exhaust and cooling tower

This measure was part of a larger, capital-intensive upgrade to the cooling towers; noteworthy is that the resident manager at The Bromley engaged with the instructor of his Green training program throughout the duration of this project, using the relationship he built with the instructor to provide a sounding-board for new ideas and feedback on different potential strategies.

Since this measure was implemented as part of a more comprehensive HVAC upgrade, it is difficult to separate out the direct cost of the garage exhaust component. An estimated cost of $25,000 is a reasonable charge for this measure if it were to stand on its own. During a site visit, performance of this configuration was verified by witnessing the cooling tower fans ramp up speed, as controlled by the VFD, in response to a demand impulse provided by the CO sensors. This particular measure, accomplished at the Bromley, demonstrates abnormally high energy savings based on the ability to eliminate two fans and integrate the system with the cooling towers. A less complex variation of this measure is to simply couple the existing garage exhaust fans to demand controls with CO sensors; fan run time is significantly reduced, yielding noteworthy savings in a cost-effective manner. The effort put forth exhibits how a well trained, conversant super can make informed decisions to eliminate unnecessary equipment, further improving the energy profile of the building.

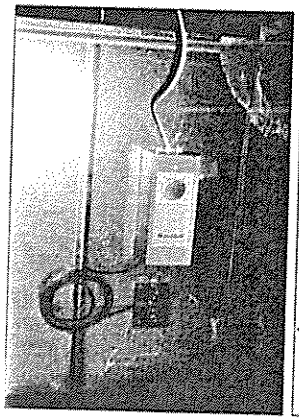
Dryer Demand Controls

The Bromley

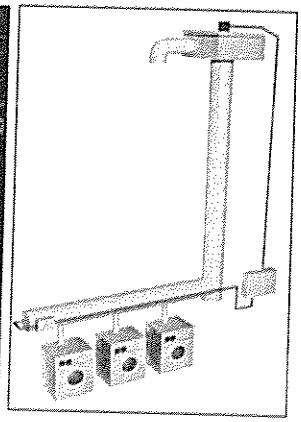
ECM	Estimated Electric Savings (kWh)	Estimated Fuel Savings (MMBtu)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
Demand Dryer Controls	12,500	104	147	$4,050	$10,000	2.46

The Bromley also pursued a simple, intuitive ECM that is seldom implemented: the installation of demand-controls for clothes dryers. Although laundry services are often leased out (with the service provider paying the electric and water bills), the impact of associated common area electric and thermal loads are not accounted for in this arrangement. Dryer operation is typically driven by continuously running rooftop exhaust fans; despite being in use only about 10-15% of the day, the fans are always running.

This practice represents a considerable waste of energy. The 24/7 operation of these fans carries a significant electric draw and, perhaps more substantial than this electric draw, is the thermal impact of continuously and unnecessarily exhausting conditioned air from the building envelope. Demand controlled dryer ventilation represents an ideal opportunity for savings that few buildings seize.
A site visit verified the laundry services were not in use, and the fan was confirmed to be in an off-cycle, dormant with the lack of a demand signal from the thermostatic controller.



Thermostatic control on dryer vent



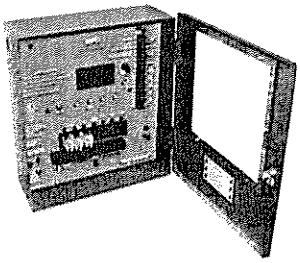
Demand controlled dryer exhaust diagram

The St. Germain

ECM	Estimated Electric Savings (kWh)	Estimated Fuel Savings (MMBtu)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
Heat Timer Upgrade	N/A	390	390	$7,600	$15,000	2.0

Heat Timer Upgrade

The St. Germaine, located at 33 Greenwich Avenue, has had great success with the installation of an upgraded Heat Timer Platinum series control panel. The panel is characterized by complex control logic and the ability to incorporate wireless temperature sensors, allowing the distribution of heat to be more precisely matched to actual indoor heating requirements. This panel gives greater control over steam cycling, distribution, and reset schedules than the obsolete model it replaced. At the St. Germaine, this panel is a great fit, as the building is in the process of undertaking a major capital renovation and converting from steam to hot water. The new panel will be considered technologically advanced for the foreseeable future, and will allow the recently installed heating and cooling systems to perform at optimal efficiency. Energy savings associated with this upgrade typically provide for a simple payback of less than 2 years. Annual savings estimates have been backed out of utility data based on projections for energy savings associated with this measure.



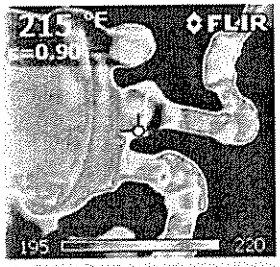
Heat Timer Platinum series control panel

The Landmark

ECM	Estimated Electric Savings (kWh)	Estimated Fuel Savings (MMBtu)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (Years)
Steam Trap Replacements	N/A	192	192	$6,400	$9,000	1.4

Steam Trap Replacements

Failed steam traps are a widespread and costly issue that can significantly drive up heating fuel consumption. A failed trap allows energy-rich steam to enter the return side of the system. As a result, distribution and imbalance problems typically develop at downstream apartments. Additionally, steam is a valuable commodity that is wasted when expelled to the atmosphere at the basement condensate receiving tank after bypassing a failed trap.



Thermal image of a failed steam trap, with hot steam in the return piping

Steam trap replacements were completed in several buildings, namely 300 East 59th Street, known as The Landmark, and in a midtown east side building. Anecdotal evidence from the super at The Landmark summarized the work, "heating elements, namely the steam traps that help to distribute heat were replaced, about 800 elements. It cost approximately $9,000 to do them". Assuming 25% of all apartment traps and 10% of main traps in the building had failed, annual savings amount to over $6,000. 201 E. 80th Street, a Brown Harris Stevens property, also did a major overhauling of steam traps, replacing all traps, roughly 650 of them.

The cost of testing a steam trap is often very close to the cost of simply replacing the trap, and because of this, many buildings, such as 201 East 80th Street and a midtown east side building, elect to simply replace all of the traps at one time rather than testing every trap and replacing only the bad ones. Surveys and industry reports suggest that around 2.5% of steam in a building system may be wasted to failed traps. Simple payback for replacing a failed steam trap is typically 12-18 months or less.

A program of proactively identifying and replacing failed steam traps, at both apartment terminal units and at main steam distribution piping, is a cost-effective measure that is best applied as part of a thorough O&M program.

Pump Replacements

The Tate

ECM	Estimated Electric Savings (kWh)	Estimated Fuel Savings (MMBtu)	Estimated Total Energy (MMBtu)	Estimated Dollar Savings	Estimated Installed Cost	Estimated Simple Payback (years)
Pump Replacement	22,500	N/A	77	$4,050	$11,000*	2.7

*Pricing data for this pump estimated from RS Means, 2011 data, New York City

In an effort to properly size aging equipment and cut back on electricity consumption, the resident manager at The Tate, 525 West 23rd Street, replaced a 10 HP domestic water booster pump with a more efficient 7.5 HP motor with variable frequency drive. Domestic water consumption patterns fluctuate considerably, with periods in the morning (6am-9am) and evening (6pm-8pm) typically having significantly greater demand than mid-day or late-night. The VFD capabilities of the new pump allows pump power, and with it electric consumption to be reduced during periods of low demand. Additionally, the domestic hot water recirculation pump was upgraded with a newer, smoother running model. These replacements contributed to an 8-10% reduction in the building's baseline electric consumption, which was depicted in the utility bills. As indicated by the resident manager, the impulse to make these upgrades came from the 32BJ Green Supers program. Calculations on this type of VFD retrofit are difficult without complex data logging, but it can be conservatively assumed that the pump realized a median annual load of 6.5 HP, corresponding to a 15% reduction in pump power owing to the VFD. When compared to a baseline condition of a continuously running 10 HP pump, this 3.5 HP pump power reduction equates to a savings of over 22,500 kWh and $4,000 per year.

Conclusions

The several ECMs highlighted in this case study are examples of the many ways that a super can wring energy savings out of their existing systems. The steam trap replacement program demonstrates how an effectively implemented O&M practice can save energy, while the garage ventilation ECM is an example of how a super might apply their training in an innovative manner while enhancing the design and installation of a planned capital improvement. The upgraded Heat Timer is a widely known measure with a tried-and-true record of performance, while the demand-controlled dryer exhaust is a less widely implemented measure; both are valuable and effective ways to reduce consumption. Opportunities to improve operational efficiencies and performance of HVAC systems are numerous and ever-evolving with technological advances. The range of possibility for energy conservation related to HVAC is enormous, with energy savings possibilities ranging from fractional percentage points for slight system adjustments to whole-building energy savings of over 50% where capital-rich system overhauls are being pursued. This case study shows that supers are interested and engaged in the process of improving their HVAC systems when given the information, tools, and training required to implement effective measures.

Green Supers Program

Isolated Energy Conservation Measure | **Indoor Air Quality & Eco-Friendly Achievements**

Buildings highlighted

- 215 West 91st Street/The De Soto
- 60 Sutton Place South
- 320 East 72nd Street
- 350 West 42nd Street/The Orion
- 372 Central Park West/The Vaux

Sampling of green cleaning products

Clothes Recycling drop off box

Across the sample of those interviewed, superintendents and resident managers who attended the *Green Supers* program developed more eco-friendly attitudes and a greater sense of ownership over the energy consumption and environmental impact of their buildings.

Moreover, they were energized and excited to implement what they had learned in their buildings. Such measures include:

- Using of green cleaning products
- Recycling & reducing tenant waste
- Using low volatile organic compound (VOC) paints and adhesives
- Providing walk-off mats at building entrances
- Sending employee dry cleaning to green cleaners

The environmental impacts of these individual measures range from modest to minimal—yet they cumulate over time. More importantly, their continued practice is a daily reminder to staff and tenants of the health and quality of life benefits that accrue to those who employ environmentally-friendly products and corresponding building management practices.

Green Measure	Impact	Estimated Cost
Green Cleaning Products	A shift to utilizing Green cleaning products reduces harmful off-gassing caused by the use and evaporation of products that have high concentrations of VOCs. The removal of these harsh chemicals positively impacts indoor air quality. Certain Green cleaning products, such as central mixing stations, also prove cost effective when compared to the continuous purchase of traditional bottled products.	$0 -$1,000
Recycling Programs	Instituting and encouraging recycling programs is a great way to engage the residents of the building in supporting a broader sustainability agenda. Some recycling programs provide financial incentives to the building for participation.	$0 -$500
Low-VOC Paints, Adhesives and Finishes	Similar to the Green cleaning products, a shift toward low-VOC construction products (e.g. paints, caulks, carpets) promotes improved IAQ. Importantly, this commitment demonstrates that the building takes resident health seriously, fostering improved relationships.	N/A
Walk-Off Mats	The installation of walk-off mats curbs concentrations of street level pollutants and chemicals in the living space, as introduced by foot traffic.	$100 -$500

Green Cleaning Products

One measure commonly pursued by supers was a switch to green cleaning products. This particular measure is considered "low-hanging fruit," and is easy to implement with neither management company/board approval nor funding requests, as was the case at 60 Sutton Place South. Many of the supers interviewed now avoid using harsh chemicals and fossil fuel-based materials such as petroleum-based products, oil solvents, etc. in favor of greener products that better promote occupant health. The evaporation of products containing VOCs diminishes indoor air quality, while the disposal of harsh chemicals can pollute the air and also adversely affect water quality. Cleaning product residue in inadequately treated water can have deleterious effects both on water quality and on local aquatic ecology. The Vaux and The De Soto are two buildings where mixing/dilution stations were installed, allowing city water to be mixed on-site with the eco-friendly cleaning solvents, providing a more cost effective means of securing cleaning supplies, while at the same time removing VOCs and positively impacting IAQ.

Centralized green cleaning station: The station adds water to concentrated green cleaner, preparing the solution for use by staff.

Recycling Programs

Several supers had also implemented recycling programs at their buildings, to varying degrees. A recycling program at The Orion focused solely on the large quantity of cardboard boxes the building disposed of in trash, due to tenant moves and building supply deliveries. The super found a company that would haul away crushed boxes---while paying the building $18 per bundle. This measure thus justified itself without much advocacy necessary on the super's part. Another super organized a light bulb and battery recycling program with involvement from Home Depot, in which Home Depot picks up and delivers the recycling to a plant in Massachusetts. At The De Soto, waste reduction goes hand in hand with socially conscious efforts; tenants can set aside household furniture and goods, clothes etc., which then gets sent to local charities.

Raising Awareness

All of these efforts play an important part in raising awareness and a sense of eco-mindedness in tenants. Something as simple as installing a walk-off mat that resists carrying street level contaminants into the building, as was done at 32 East 72nd St, provides a visual reminder that the building is making occupant health a priority, while in the process generating interest in the initiative. Several supers specifically mentioned that the recycling programs got children in the building excited about "going green". Seeing prominent recycling options in their building reminded children about lessons learned at school—and encouraged them to bring their parents into the conversation about greener habits. In cooperative buildings, these parents comprise the board—the decision makers on funding for future retrofits and energy minded projects.

Conclusions

While a handful of supers have been met with enthusiasm by their boards/management companies, collaborating with them to pursue long-term capital projects and more costly retrofits, other supers have faced greater resistance and have had difficulty obtaining funding and permission to do work. However, green cleaning options and other indoor air quality improvements provide simpler, lower cost, and effective opportunities that supers are at greater liberty to pursue. The impact of moving toward an eco-friendly management style is quickly recognized by residents that appreciate efforts to make the building more environmentally friendly and healthful.

Green Supers Program

Isolated Energy Conservation Measure | Operations & Maintenance

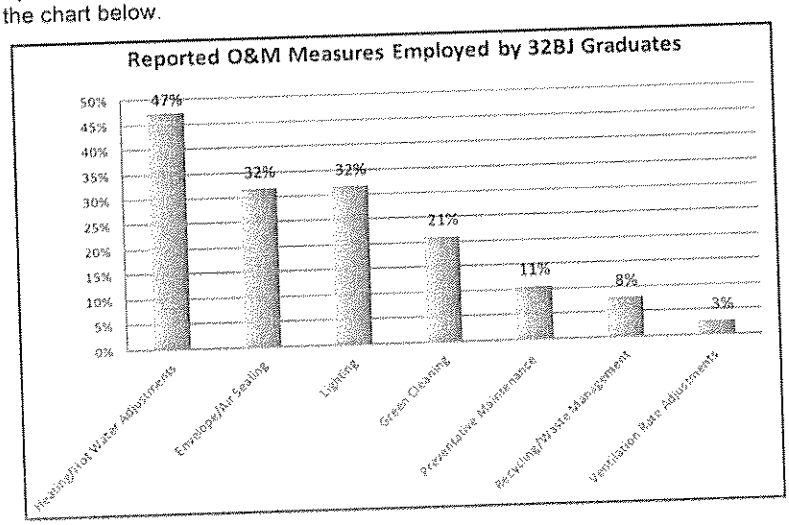
Buildings highlighted

- 225 West 83rd Street / The Bromley
- 2700 Broadway
- 885 Park Avenue
- 601 Surf Avenue
- 201 East 80th Street
- 60 Sutton Place

Many graduates of the *Green Supers* program reported that a critical take away from the program was the development of process improvements related to operations and maintenance (O&M) practices. Feedback from the participants often described an improved overall understanding of how their building operates "as a system". The program provides an enhanced description of how all of the different systems are intended to operate and interact, forcing each participant to reflect on the performance and maintenance standards of their own building. An improved understanding of how systems should function and should be maintained encourages each super to apply a customized approach to improving O&M programs. The result is the organic development of O&M process improvements at each specific property.

The training dedicates considerable course time to specific O&M procedures which might be broadly applied across a wide range of buildings. Participants are educated on effective products and techniques which can help assist the O&M process: record keeping, daily logs, modern technology, and preventative maintenance. Utilizing available resources to assist record keeping and daily management allows for the proactive identification of preventative maintenance issues which might have otherwise festered and become larger and more expensive problems in the future. Many of the preventative maintenance issues which frequently go un-identified (e.g., steam trap failure, combustion problems, water leaks, etc.) also have a direct association with elevated energy consumption.

Interviews were conducted with thirty eight of the program's graduates. Of the interviewees, 79% reported implementing O&M improvements following their training participation. A breakdown of the implemented O&M measures is shown in the chart below.



Software Technologies

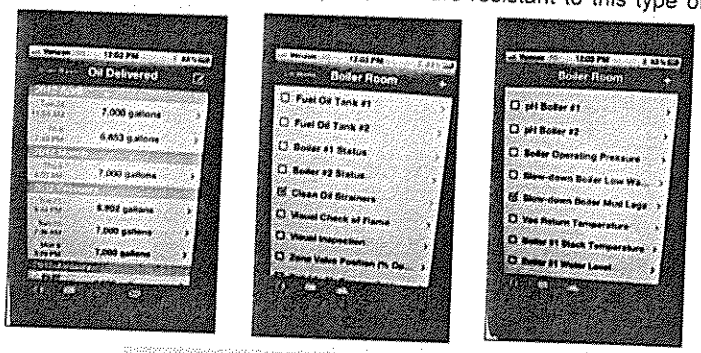
A few different software platforms were cited by a number of supers as easy-to-use and helpful tools in their daily operations and maintenance work. Supers gave overwhelmingly positive feedback on different smartphone applications, or "apps," and referenced them as major advancements. The user-friendly interface of a few of the programs encourages building management to monitor and record conditions critical to building performance in a central location, examples include boiler stack temperatures, oil deliveries, and electric/water/gas metering. When properly configured, these apps provide alarms when operational anomalies occur. For example, an alert might be sent out if as a spike in water consumption is identified, informing management that there may be an undiscovered plumbing leak. The Bromley has gone nearly paperless in their day-to-day management since rolling out this software.

These types of web-based building management platforms can be powerful tools. Supers reported being familiar with several different software programs. The intent of one in particular is to couple a digital preventative maintenance program for major building systems with a resident management software platform, allowing the related disciplines of

preventative maintenance and resident work orders to be combined in one program. When configured properly, this platform allows building management to more efficiently address tenant concerns, while logging and trending pertinent building O&M information.

Manual Daily Logs

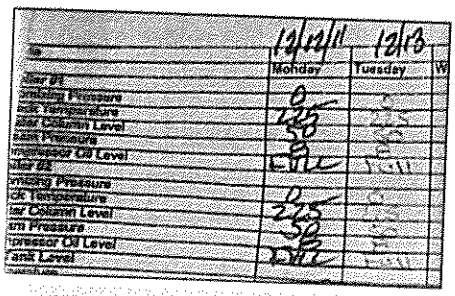
The direction of O&M best practices are undoubtedly trending toward a web enabled interface. The building management industry in NYC, however, has a strong make up of traditional supers, who are resistant to this type of digital change. Many supers still prefer the old fashion pencil and paper method. It is important to recognize that, although surpassed in many ways by the modern technologies, a regimented pencil and paper program of logging data can still be an effective building management technique. Several participants in the program provided feedback that, while acknowledging the useful nature of the new tools, they prefer to retain the tried-and-true methods they have used in the past. A super with a regimented O&M and preventative maintenance program who logs information with a pencil should be preferred to a super who is forced to use a web based tool that they perceive to be confusing and time consuming at the point of use. Many of these customary building operators responded that they benefitted from the introduction to the new technologies, but were not yet ready to adopt them quite yet. Several suggested a more gradual introduction and beginner level trainings on these new technologies for the less computer-savvy supers.



Building management smart phone app

Building Performance and Maintenance Changes

Many supers reported taking away from the training specific building performance or preventative maintenance knowledge which they immediately applied to their building. One super in Queens has begun operating his steam boiler at a lower pressure, saving heating fuel as well as wear-and-tear on system components. Supers at 2700 Broadway and 885 Park Avenue reported taking a new approach to O&M through the application of a more rigorous preventative maintenance plan for the major building systems; preventative maintenance process improvements typically do not manifest in immediate energy savings, but they save time, money, and reduce capital expenditures in the long term. The super at 601 Surf Avenue in Brooklyn specifically mentioned a more thorough maintenance plan directed at the heating system: tank readings are taken daily, steam traps are checked frequently, and sensors are monitored to make sure they are installed properly and working correctly.



Effective pencil and paper daily O&M log

Green Cleaning

The shift toward green cleaning products was a popular and easy to step to execute in many buildings. The super at 201 East 80th Street reported that the entire building has taken the new approach toward green cleaning "very seriously," and they are even shifting toward utilizing a green dry cleaning service for their uniforms. The resident manager at 60 Sutton Place South reported a similar incorporation of green cleaning techniques, mentioning that this was one of the easier measures to implement because it does not require the approval of the Co-op board.

Communication Skills

A recurring theme mentioned by many graduates of the Program was the development of professional communication skills and the effect they had on their ability to execute green upgrades. The technical, environmental, and economic dynamics of these projects can be complicated to even seasoned energy professionals. Condo and Co-op boards are often very diverse in their makeup, many with decision makers that lack a technical background in building systems. Multiple participants in the *Green Supers* program cited their improved ability to communicate these complex issues, a skill directly linked to the training. A newly developed ability to push energy conservation initiatives to the decision makers within their board or management company was a skill that many supers spoke highly about. In fact, being able to clearly communicate O&M issues and energy saving opportunities with the building owner, tenants, and staff was regarded as one of the most important new skills developed during the training.

Conclusions

The program participants had a very favorable review of the training's curriculum regarding O&M issues. Many O&M improvements have little or no impact on energy consumption in the short term, making it very difficult to quantify direct energy savings to these types of changes. Savings from a program of O&M improvements typically manifest over a multi-year period and become evident in the building's long term balance sheet as the building is run more efficiently and unnecessary repairs dwindle. Preventative maintenance improves the efficiency and the effectiveness of the building's maintenance staff, as problems that might otherwise have escalated are identified early and repaired. A strong preventative maintenance plan allows building staff to become more comfortable with the major systems in their building, resulting in an improved ability to monitor and fine tune the performance of these systems, potentially saving energy in the process. Improved O&M processes may also lead to greater utilization of valuable employee man hours and improved indoor air quality. Often not immediately evident in utility bills, O&M improvements add up over time and turn into real long term savings, lending stability and flexibility to the building's future capital plans.

INTERNATIONAL ASSOCIATION OF HEAT & FROST INSULATORS & ALLIED WORKERS
Local No. 12 City New York City State New York
Address 35-53 24th Street, Long Island City, NY 11106-4416

April 2, 2014

New York City Council Hearing Pertaining to Mechanical Insulation

My name is Matthew Aracich, I am the Business Manager of the Heat and Frost Insulators, Local Union No.12 which was established in 1884 and I represent more than 500 members and their families, the vast majority live in NY City.

I thank you for the opportunity to address the panel of Council Members on the issue of Intro No. 16; Article 316, Insulation of Concealed Pipes exposed during Alteration or Repair

Local 12 rises in support of amending Section 1., Chapter 3 of Title 28 of the Administrative Code of the City of New York: Local Law number 141 for the year 2013 by adding a new article 316.

Based on data from more than 700 energy assessments, the National Insulation Association estimates that implementing a national comprehensive mechanical insulation maintenance and upgrade program in the commercial and industrial market segments would lead to:

Energy savings of $4.8 Billion Dollars per year
CO2 reductions of 43 Million Metric Tons per year
Generation of 89,000 jobs
What do these numbers mean?

Energy savings:
- 45 billion kwh of electricity, enough to power 4.2 million households (4% of U.S. Households) for a year and equivalent to annual output from 10,300 wind turbines
- 82 million barrels of oil, enough to fill about 41 supertankers
- 19 million tons of coal, enough to fill 190,000 railcars
- 480,000,000,000,000 BTU's (0.48 quadrillion BTU's) of primary energy—about 0.5% of total U.S. annual consumption or 1.83 days of energy consumption for the entire U.S.

CO_2 reductions:
- Adding 1.9 billion mature trees (4.3 million acres of new forest, an area the size of the State of Delaware and Connecticut and combined)
- Removing 7.9 million cars from the roads, about 3% of 254 million cars in the U.S.
- Installing 730 million compact florescent light bulbs, equivalent to 2.3 light bulbs for every man, woman, and child in the United States

Telephone (718) 784-3456
Fax (718) 784-8357

Generation of over 89,000 jobs:
Mechanical insulation maintenance is an excellent example of "shovel-ready" green job opportunities. The largest untapped resource for savings utilizing Mechanical Insulation is right here in New York City. Our city has the world's largest Steam Supply System. It is a system that includes 105 miles of piping that runs under New York City's streets. This Steam System is utilized year round to provide heating and cooling for the all types of facilities throughout the city. New York City can put thousands of people to work and retain existing jobs while contributing to the competitiveness of U.S. manufacturing, reducing our country's dependence on foreign energy sources, improving our environment, and increasing profitability of private and public businesses and facilities. Mechanical insulation is a proven technology. It does not require R&D, Engineering or Design Processes and can meet the Mayor's 2030 Plan of reducing emissions in a matter of a few years.

Just one worker for a single day can save:
• An application of Insulating Materials on 45 linear feet of 8-in. high-pressure steam line equates to about $13,600 per year in energy savings, equivalent to removing 13 cars per year from the highways. Assuming the facility exists for 20 more years, the total energy savings from that one workday would be $272,000. Those savings are based on the cost of oil being $58.00 per barrel, however when the cost of oil rises to $108.00 per barrel the savings are $492,000 dollars for one day's work over a twenty year period.
• Insulating 70 linear feet of 3-in. low pressure steam line equates to over $4,000 per year in energy savings, reducing CO2 emissions as much as removing 3.7 cars from the highways. Assuming the facility exists for 20 more years, the total energy savings from that one workday would be $80,000.

The numbers that I quoted are verified from calculations provided to us by the U.S. Dept of Energy and the Oak Ridge National Laboratory. I have given presentations for every level of government, and you can have comfort in knowing that I speak from experience. I can back this up by stating that not just anyone has the distinction of receiving an invitation from the White House to express their views as an expert in creating jobs in the Green Energy sector.

I have in my possession a flash drive that explains the importance of Mechanical Insulation. Once again I thank you for the opportunity to provide testimony on this important issue.

Matthew Aracich
Business Manager
Heat · Frost Insulators
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STATE OF NEW YORK

4414

2013-2014 Regular Sessions

IN ASSEMBLY

February 5, 2013

Introduced by M. of A. HEVESI -- read once and referred to the Committee
on Ways and Means

AN ACT to amend the tax law, in relation to providing a tax deduction
for the installation of mechanical insulation property

THE PEOPLE OF THE STATE OF NEW YORK, REPRESENTED IN SENATE AND ASSEM-
BLY, DO ENACT AS FOLLOWS:

Section 1. Paragraph (a) of subdivision 9 of section 208 of the tax
law is amended by adding a new subparagraph 18 to read as follows:

(18) THE APPLICABLE PERCENTAGE OF THE COST OF MECHANICAL INSULATION
PROPERTY INSTALLED IN REAL PROPERTY LOCATED IN THIS STATE DURING THE
TAXABLE YEAR.

(A) DEFINITIONS. FOR PURPOSES OF THIS SUBPARAGRAPH, THE FOLLOWING
DEFINITIONS SHALL APPLY: (I) "APPLICABLE PERCENTAGE" SHALL MEAN THE
LESSER OF: (I) THIRTY PERCENT OF THE COST OF THE MECHANICAL INSULATION
PROPERTY PLACED IN SERVICE; OR (II) THE EXCESS, IF ANY, OF (A) THE ENER-
GY SAVINGS, EXPRESSED AS A PERCENTAGE, OBTAINED BY PLACING SUCH MECHAN-
ICAL INSULATION PROPERTY IN SERVICE IN CONNECTION WITH A MECHANICAL
SYSTEM, OVER (B) THE ENERGY SAVINGS, EXPRESSED AS A PERCENTAGE, SUCH

PROPERTY IS REQUIRED TO MEET BY STANDARD 90.1-2007, DEVELOPED AND
PUBLISHED BY THE AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CON-
DITIONING ENGINEERS.
(II) "COST" SHALL MEAN (I) THE AMOUNTS PAID DURING THE TAXABLE YEAR
FOR THE PURCHASE OF MECHANICAL INSULATION PROPERTY THAT IS INSTALLED
DURING THE TAXABLE YEAR AND (II) LABOR COSTS PAID DURING THE TAXABLE
YEAR THAT ARE PROPERLY ALLOCABLE TO THE PREPARATION, ASSEMBLY AND
INSTALLATION OF MECHANICAL INSULATION PROPERTY; PROVIDED, HOWEVER, IN
THE CASE OF REMOVAL AND DISPOSAL OF THE OLD MECHANICAL INSULATION PROP-
ERTY, COST SHALL MEAN THIRTY PERCENT OF THE COST FOR PURCHASE OF THE NEW
MECHANICAL INSULATION PROPERTY, AND PROVIDED, FURTHER, THAT IF THE
TAXPAYER CLAIMS THE EXCLUSION PROVIDED BY THIS SUBPARAGRAPH THE TAXPAYER
SHALL EXCLUDE ALL AMOUNTS INCLUDED IN THE EXCLUSION COMPUTATION PURSUANT

EXPLANATION--Matter in ITALICS (underscored) is new; matter in brackets
[ ] is old law to be omitted.

LBD07108-01-3
A. 4414

TO THIS SUBPARAGRAPH FROM THE COMPUTATION OF ANY OTHER EXCLUSION,
DEDUCTION OR CREDIT PROVIDED BY THIS CHAPTER. THE TERM COST SHALL NOT
INCLUDE ANY AMOUNT PROPERLY ATTRIBUTABLE TO MAINTENANCE.
(III) "MECHANICAL INSULATION PROPERTY" SHALL MEAN INSULATION MATERI-
ALS, FACINGS AND ACCESSORY PRODUCTS (I) PLACED IN SERVICE IN CONNECTION
WITH A MECHANICAL SYSTEM WHICH IS LOCATED IN THE STATE OF NEW YORK AND
IS OF A CHARACTER SUBJECT TO AN ALLOWANCE FOR DEPRECIATION; AND (II)

UTILIZED FOR THERMAL, ACOUSTICAL AND PERSONNEL SAFETY REQUIREMENTS FOR
MECHANICAL PIPING AND EQUIPMENT, HOT AND COLD APPLICATIONS, AND HEATING,
VENTING AND AIR CONDITIONING APPLICATIONS WHICH CAN BE USED IN A VARIETY
OF FACILITIES.

(B) FOR THE PURPOSES OF THIS SUBPARAGRAPH, ENERGY SAVINGS SHALL BE
COMPUTED PURSUANT TO THE REGULATIONS PROMULGATED BY THE COMMISSIONER OF
THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, IN CONSULTATION WITH
NYSERDA.

S 2. Subsection (c) of section 612 of the tax law is amended by adding
a new paragraph 27 to read as follows:

(27) THE APPLICABLE PERCENTAGE OF THE COST OF MECHANICAL INSULATION
PROPERTY INSTALLED IN REAL PROPERTY LOCATED IN THIS STATE DURING THE
TAXABLE YEAR.

(A) DEFINITIONS. FOR PURPOSES OF THIS PARAGRAPH, THE FOLLOWING DEFI-
NITIONS SHALL APPLY:

(I) "APPLICABLE PERCENTAGE" SHALL MEAN THE LESSER OF:

(I) THIRTY PERCENT OF THE COST OF THE MECHANICAL INSULATION PROPERTY
PLACED IN SERVICE; OR

(II) THE EXCESS, IF ANY, OF (A) THE ENERGY SAVINGS, EXPRESSED AS A
PERCENTAGE, OBTAINED BY PLACING SUCH MECHANICAL INSULATION PROPERTY IN
SERVICE IN CONNECTION WITH A MECHANICAL SYSTEM, OVER (B) THE ENERGY
SAVINGS, EXPRESSED AS A PERCENTAGE, SUCH PROPERTY IS REQUIRED TO MEET BY
STANDARD 90.1-2007, DEVELOPED AND PUBLISHED BY THE AMERICAN SOCIETY OF
HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS.

(II) "COST" SHALL MEAN (I) THE AMOUNTS PAID DURING THE TAXABLE YEAR
FOR THE PURCHASE OF MECHANICAL INSULATION PROPERTY THAT IS INSTALLED
DURING THE TAXABLE YEAR, AND (II) FOR LABOR COSTS PAID DURING THE TAXA-

BLE YEAR THAT ARE PROPERLY ALLOCABLE TO THE PREPARATION, ASSEMBLY AND
INSTALLATION OF MECHANICAL INSULATION PROPERTY, PROVIDED, HOWEVER, IN
THE CASE OF REMOVAL AND DISPOSAL OF THE OLD MECHANICAL INSULATION PROP-
ERTY, COST SHALL MEAN THIRTY PERCENT OF THE COST FOR PURCHASE OF THE NEW
MECHANICAL INSULATION PROPERTY, AND PROVIDED, FURTHER, THAT IF THE
TAXPAYER CLAIMS THE EXCLUSION PROVIDED BY THIS SUBPARAGRAPH THE TAXPAYER
SHALL EXCLUDE ALL AMOUNTS INCLUDED IN THE EXCLUSION COMPUTATION PURSUANT
TO THIS SUBPARAGRAPH FROM THE COMPUTATION OF ANY OTHER EXCLUSION,
DEDUCTION OR CREDIT PROVIDED BY THIS CHAPTER. THE TERM COST SHALL NOT
INCLUDE ANY AMOUNT PROPERLY ATTRIBUTABLE TO MAINTENANCE.

(III) "MECHANICAL INSULATION PROPERTY" SHALL MEAN INSULATION MATERI-
ALS, FACINGS AND ACCESSORY PRODUCTS (I) PLACED IN SERVICE IN CONNECTION
WITH A MECHANICAL SYSTEM WHICH IS LOCATED IN THE STATE OF NEW YORK AND
IS OF A CHARACTER SUBJECT TO AN ALLOWANCE FOR DEPRECIATION; AND (II)
UTILIZED FOR THERMAL, ACOUSTICAL AND PERSONNEL SAFETY REQUIREMENTS FOR
MECHANICAL PIPING AND EQUIPMENT, HOT AND COLD APPLICATIONS, AND HEATING,
VENTING AND AIR CONDITIONING APPLICATIONS WHICH CAN BE USED IN A VARIETY
OF FACILITIES.

(B) FOR THE PURPOSES OF THIS PARAGRAPH, ENERGY SAVINGS SHALL BE
COMPUTED PURSUANT TO THE REGULATIONS PROMULGATED BY THE COMMISSIONER OF
THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, IN CONSULTATION WITH
NYSERDA.

S 3. This act shall take effect on the one hundred twentieth day after

it shall have become a law and shall apply to taxable years commencing on or after such effective date; provided, however, that effective immediately, the addition, amendment and/or repeal of any rule or regulation necessary for the implementation of this act on its effective date are authorized and directed to be made and completed on or before such effective date.

INTERNATIONAL ASSOCIATION OF HEAT & FROST INSULATORS & ALLIED WORKERS
Local No. 12 City New York City State New York
Address 35-53 24th Street, Long Island City, NY 11106-4416

April 2, 2014

FOR THE RECORD

Hon. Jumaane Williams, Chair
Committee on Housing and Buildings
New York City Council
City Hall
New York, NY 10007

Re: **Int. No. 13** - In relation to requiring the base building systems of certain buildings to be operated by individuals with a certificate in building energy efficiency from an approved program.
Int. No. 14 - In relation to requiring analysis of heating and cooling needs during building design.
Int. No. 16 - In relation to requiring insulation of existing concealed pipes exposed during alterations or repair.
Int. No. 93 - In relation to requiring the use of mold-resistant gypsum board and cement board in moisture-prone locations.
Int. No. 184 - In relation to the allowable maximum heat loss through building walls.
Int. No. 202 - In relation to public access stairways.
Int. No. 203 - In relation to hold-open devices and automatic closing of exit doors serving vertical exit enclosures.
Preconsidered Int. No. - In relation to construction site lighting.
Preconsidered Int. No. - In relation to protecting street trees during construction activities.
Preconsidered Int. No. - In relation to system commissioning.

Dear Chair Williams,

The Heat • Frost Insulators, Local Union No. 12 represents over 500 Active members and 330 Retirees. Throughout the years, the Heat and Frost Insulators and other labor unions have displayed unwavering dedication to building a socially, economically and environmentally just New York City.

The Heat • Frost Insulators, Local Union No. 12 enthusiastically supports the green building legislation on the Committee of Housing and Building's agenda today. We all spend most of every day inside New York City buildings, making the building code a crucial tool for ensuring the health and safety of New Yorkers.

Telephone (718) 784-3456
Fax (718) 784-8357

The building code also has a uniquely positive impact on carbon pollution and global warming. By 2030, green codes measures already implemented will reduce citywide carbon emissions by almost 5%, and lower daily water consumption by the equivalent of 30 Central Park Reservoirs. But codes requirement constant improvement to stay on the cutting edge and enable economic development in New York City.

The Council has a long tradition of city, state, and national leadership in green codes. The Committee is to be commended for taking up a serious slate of green bills early in its term. The current set of bills are worthy of close attention and quick passage, and we encourage the Council to continue its work on green codes beyond this bill package.

Buildings in New York City create 79% of the carbon pollution and use 85% of the electricity of our city. A well-trained workforce is essential to improving these numbers (Int 13) as well as for economic development and better jobs. By requiring designs to incorporate actual heating and cooling needs (Int 14) and account for actual heating losses through building walls (Int 184) systems will be properly sized, making them less expensive and more efficient. Cost-effective strategies like insulating exposed pipes (Int 16), using energy-efficient bulbs on construction sites (Preconsidered) and making sure buildings are commissioned so they work properly after construction (Preconsidered) have been thoroughly tested by market leaders and are ready to have their benefits spread to all.

New Yorkers' health, especially children who are most susceptible to asthma and other respiratory issues, will be improved by making sure bathrooms and other wet areas do not grow mold (Int 93). The Council can encourage health through active design by making stairs more accessible and usable (Int 202 and 203). Since mold prevention and ensuring stairs are usable during a power outage are also key for building resiliency, these bills have renewed urgency since Sandy.

We look forward to supporting the Council in its efforts to build a healthier, greener, and more resilient New York.

Respectfully submitted,

Matthew Aracich
Business Manager
Heat • Frost Insulators
Local Union No.12
35-53 24th Street
Long Island City, NY 11106-4416
(917) 391-7200 cell

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Asbestos Workers Union Local 12
Current and Projected Staffing and Annual Goals
As of 04/02/2014

Name SS Age Sex

	Total	Caucasin	Afrian American	Hispanic	Other Minority	Woman
Active Journeyworkers	434	339	39	54	1	1
Registered Apprentices	75	49	8	8	5	5
Totals	509	388	47	62	6	6

STATE OF NEW YORK

2499

2013-2014 Regular Sessions

IN SENATE

January 18, 2013

Introduced by Sen. MAZIARZ -- read twice and ordered printed, and when printed to be committed to the Committee on Investigations and Government Operations

AN ACT to amend the tax law, in relation to providing a tax deduction for the installation of mechanical insulation property

THE PEOPLE OF THE STATE OF NEW YORK, REPRESENTED IN SENATE AND ASSEMBLY, DO ENACT AS FOLLOWS:

Section 1. Paragraph (a) of subdivision 9 of section 208 of the tax law is amended by adding a new subparagraph 18 to read as follows:

(18) THE APPLICABLE PERCENTAGE OF THE COST OF MECHANICAL INSULATION PROPERTY INSTALLED IN REAL PROPERTY LOCATED IN THIS STATE DURING THE TAXABLE YEAR.

(A) DEFINITIONS. FOR PURPOSES OF THIS SUBPARAGRAPH, THE FOLLOWING DEFINITIONS SHALL APPLY: (I) "APPLICABLE PERCENTAGE" SHALL MEAN THE LESSER OF: (I) THIRTY PERCENT OF THE COST OF THE MECHANICAL INSULATION PROPERTY PLACED IN SERVICE; OR (II) THE EXCESS, IF ANY, OF (A) THE ENERGY SAVINGS, EXPRESSED AS A PERCENTAGE, OBTAINED BY PLACING SUCH MECHANICAL INSULATION PROPERTY IN SERVICE IN CONNECTION WITH A MECHANICAL

SYSTEM, OVER (B) THE ENERGY SAVINGS, EXPRESSED AS A PERCENTAGE, SUCH
PROPERTY IS REQUIRED TO MEET BY STANDARD 90.1-2007, DEVELOPED AND
PUBLISHED BY THE AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CON-
DITIONING ENGINEERS.

(II) "COST" SHALL MEAN (I) THE AMOUNTS PAID DURING THE TAXABLE YEAR
FOR THE PURCHASE OF MECHANICAL INSULATION PROPERTY THAT IS INSTALLED
DURING THE TAXABLE YEAR AND (II) LABOR COSTS PAID DURING THE TAXABLE
YEAR THAT ARE PROPERLY ALLOCABLE TO THE PREPARATION, ASSEMBLY AND
INSTALLATION OF MECHANICAL INSULATION PROPERTY; PROVIDED, HOWEVER, IN
THE CASE OF REMOVAL AND DISPOSAL OF THE OLD MECHANICAL INSULATION PROP-
ERTY, COST SHALL MEAN THIRTY PERCENT OF THE COST FOR PURCHASE OF THE NEW
MECHANICAL INSULATION PROPERTY, AND PROVIDED, FURTHER, THAT IF THE
TAXPAYER CLAIMS THE EXCLUSION PROVIDED BY THIS SUBPARAGRAPH THE TAXPAYER

EXPLANATION--Matter in ITALICS (underscored) is new; matter in brackets
[ ] is old law to be omitted.

LBD07108-01-3
S. 2499

SHALL EXCLUDE ALL AMOUNTS INCLUDED IN THE EXCLUSION COMPUTATION PURSUANT
TO THIS SUBPARAGRAPH FROM THE COMPUTATION OF ANY OTHER EXCLUSION,
DEDUCTION OR CREDIT PROVIDED BY THIS CHAPTER. THE TERM COST SHALL NOT
INCLUDE ANY AMOUNT PROPERLY ATTRIBUTABLE TO MAINTENANCE.

(III) "MECHANICAL INSULATION PROPERTY" SHALL MEAN INSULATION MATERI-
ALS, FACINGS AND ACCESSORY PRODUCTS (I) PLACED IN SERVICE IN CONNECTION
WITH A MECHANICAL SYSTEM WHICH IS LOCATED IN THE STATE OF NEW YORK AND

IS OF A CHARACTER SUBJECT TO AN ALLOWANCE FOR DEPRECIATION; AND (II) UTILIZED FOR THERMAL, ACOUSTICAL AND PERSONNEL SAFETY REQUIREMENTS FOR MECHANICAL PIPING AND EQUIPMENT, HOT AND COLD APPLICATIONS, AND HEATING, VENTING AND AIR CONDITIONING APPLICATIONS WHICH CAN BE USED IN A VARIETY OF FACILITIES.

(B) FOR THE PURPOSES OF THIS SUBPARAGRAPH, ENERGY SAVINGS SHALL BE COMPUTED PURSUANT TO THE REGULATIONS PROMULGATED BY THE COMMISSIONER OF THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, IN CONSULTATION WITH NYSERDA.

S 2. Subsection (c) of section 612 of the tax law is amended by adding a new paragraph 27 to read as follows:

(27) THE APPLICABLE PERCENTAGE OF THE COST OF MECHANICAL INSULATION PROPERTY INSTALLED IN REAL PROPERTY LOCATED IN THIS STATE DURING THE TAXABLE YEAR.

(A) DEFINITIONS. FOR PURPOSES OF THIS PARAGRAPH, THE FOLLOWING DEFI-NITIONS SHALL APPLY:

(I) "APPLICABLE PERCENTAGE" SHALL MEAN THE LESSER OF:

(I) THIRTY PERCENT OF THE COST OF THE MECHANICAL INSULATION PROPERTY PLACED IN SERVICE; OR

(II) THE EXCESS, IF ANY, OF (A) THE ENERGY SAVINGS, EXPRESSED AS A PERCENTAGE, OBTAINED BY PLACING SUCH MECHANICAL INSULATION PROPERTY IN SERVICE IN CONNECTION WITH A MECHANICAL SYSTEM, OVER (B) THE ENERGY SAVINGS, EXPRESSED AS A PERCENTAGE, SUCH PROPERTY IS REQUIRED TO MEET BY STANDARD 90.1-2007, DEVELOPED AND PUBLISHED BY THE AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS.

(II) "COST" SHALL MEAN (I) THE AMOUNTS PAID DURING THE TAXABLE YEAR FOR THE PURCHASE OF MECHANICAL INSULATION PROPERTY THAT IS INSTALLED

DURING THE TAXABLE YEAR, AND (II) FOR LABOR COSTS PAID DURING THE TAXA-
BLE YEAR THAT ARE PROPERLY ALLOCABLE TO THE PREPARATION, ASSEMBLY AND
INSTALLATION OF MECHANICAL INSULATION PROPERTY, PROVIDED, HOWEVER, IN
THE CASE OF REMOVAL AND DISPOSAL OF THE OLD MECHANICAL INSULATION PROP-
ERTY, COST SHALL MEAN THIRTY PERCENT OF THE COST FOR PURCHASE OF THE NEW
MECHANICAL INSULATION PROPERTY, AND PROVIDED, FURTHER, THAT IF THE
TAXPAYER CLAIMS THE EXCLUSION PROVIDED BY THIS SUBPARAGRAPH THE TAXPAYER
SHALL EXCLUDE ALL AMOUNTS INCLUDED IN THE EXCLUSION COMPUTATION PURSUANT
TO THIS SUBPARAGRAPH FROM THE COMPUTATION OF ANY OTHER EXCLUSION,
DEDUCTION OR CREDIT PROVIDED BY THIS CHAPTER. THE TERM COST SHALL NOT
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VENTING AND AIR CONDITIONING APPLICATIONS WHICH CAN BE USED IN A VARIETY
OF FACILITIES.

(B) FOR THE PURPOSES OF THIS PARAGRAPH, ENERGY SAVINGS SHALL BE
COMPUTED PURSUANT TO THE REGULATIONS PROMULGATED BY THE COMMISSIONER OF

THE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, IN CONSULTATION WITH
NYSERDA.

S 3. This act shall take effect on the one hundred twentieth day after it shall have become a law and shall apply to taxable years commencing on or after such effective date; provided, however, that effective immediately, the addition, amendment and/or repeal of any rule or regulation necessary for the implementation of this act on its effective date are authorized and directed to be made and completed on or before such effective date.

A simplistic view

Insulation, a better option than a light bulb

Energy Conservation Option	Energy Savings, MMBtu/yr (1)
1 ft of insulation on 350°F pipe	14.4
1 car, 5% increase in mpg	3.7
1 compact florescent light bulb	0.9
1 ft of insulation on 180°F pipe	0.9
1 ft of insulation on 42°F pipe	0.6
1 tree	n/a

Energy conservation with the use of mechanical insulation -"Low Hanging Fruit" - is simply an OPPORTUNITY that should not be overlooked

It is an investment that may have few rivals from a return perspective.

(1) Equivalent energy savings in Millions of Btu/yr (MMBtu/yr) of primary fuel

National Insulation Association
Insulation Outlook – January 2009

Insulation, Is "Greener" than Trees

Carbon Reduction Option	Lbs of CO_2 per Year
1 ft of insulation on 350°F pipe	2,308
1 car, 5% increase in mpg	570
1 compact florescent light bulb	130
1 ft of insulation on 180°F pipe	109
1 ft of insulation on 42°F pipe	88
1 tree	50

National Insulation Association
Insulation Outlook – January 2009

Mechanical Insulation Maintenance and Upgrade:

Here's What You Need to Know

Based on data from more than 700 industrial energy assessments, the National Insulation Association estimates that implementing a comprehensive mechanical insulation maintenance and upgrade program in the commercial and industrial market segments would lead to:

Energy savings of $4.8 billion per year

CO_2 reductions of 43 million metric tons per year

Generation of 89,000 jobs

What do these numbers mean?

Energy savings of $4.8 billion per year equates to:

- 45 billion kWh of electricity, enough to power 4.2 million households (4% of U.S. households) for a year and equivalent to annual output from 10,300 wind turbines
- 82 million barrels of oil, enough to fill about 41 supertankers
- 19 million tons of coal, enough to fill 190,000 railcars
- 480,000,000,000,000 Btus (0.48 quadrillion Btus) of primary energy—about 0.5% of total U.S. annual consumption or 1.83 days of energy consumption for the entire United States

43 metric tons of CO_2 reduction per year equates to:

- Adding 1.9 billion mature trees (4.3 million acres of new forest, an area the size of Connecticut and Delaware combined)
- Removing 7.9 million cars from the roads, about 3% of 254 million cars registered in the United States
- Shutting down 11 coal-fired power plants, 1.6% of U.S. installed coal-fired capacity
- Installing 730 million compact florescent light bulbs, equivalent to 2.3 light bulbs for every man, woman, and child in the United States

Generation of over 89,000 jobs:

Mechanical insulation maintenance is an excellent example of "shovel-ready" green job opportunities for stimulus spending. It can put tens of thousands of people to work and retain existing jobs while contributing to the competitiveness of U.S. manufacturing, reducing our country's dependence on foreign energy sources, improving our environment, and increasing profitability of private and public businesses and facilities. Equally important, the majority of insulation contractors who install and maintain mechanical insulation systems represent independent small businesses in every state. Mechanical insulation is a proven technology. It does not require research and development or engineering or design processes. Materials and skilled craft personnel are available now and ready to be deployed.

Just one worker for a single day can save:

- Insulating 45 linear feet of 8-in. high-pressure steam line equates to about $13,600 per year in energy savings, equivalent to removing 13 cars per year from the highways. Assuming the facility exists for 20 more years, the total energy savings from that one workday would be $272,000.
- Insulating 70 linear feet of 3-in. low pressure steam line equates to over $4,000 per year in energy savings, reducing CO_2 emissions as much as removing 3.7 cars from the highways. Assuming the facility exists for 20 more years, the total energy savings from that one workday would be $80,000.

NIA
National Insulation Association
www.insulation.org

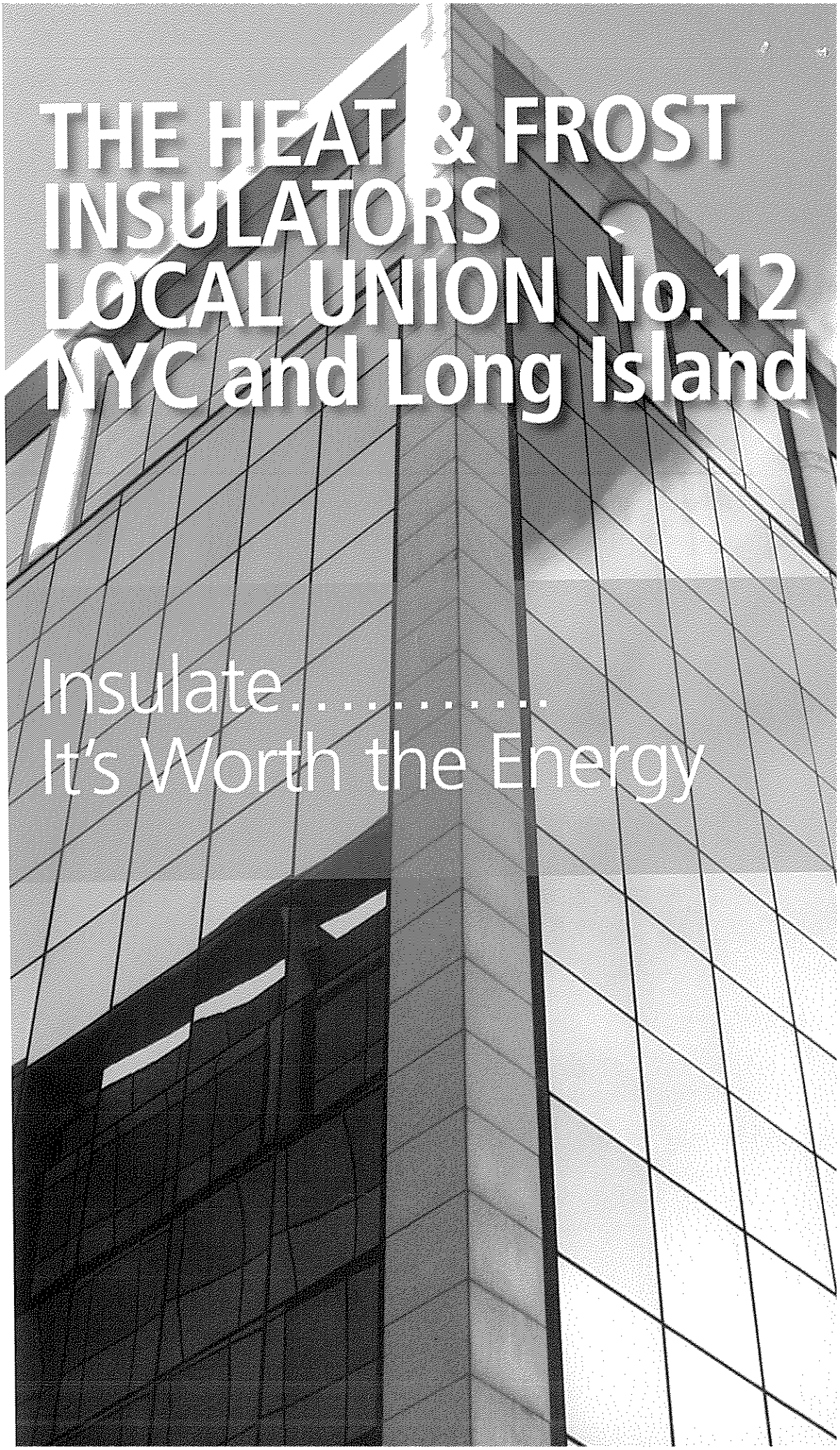
National Insulation Association
12100 Sunset Hills Road,
Suite 330
Reston, VA 20190
Phone 703-464-6422 • Fax: 703-464-5896
www.insulation.org

www.insulators.org

International Association of Heat and Frost Insulators and Allied Workers
9602 Martin Luther King Highway
Lanham, MD 20706
Phone: 301-731-9101 • Fax: 301-731-5058
www.insulators.org

THE HEAT & FROST INSULATORS LOCAL UNION No.12

NYC and Long Island



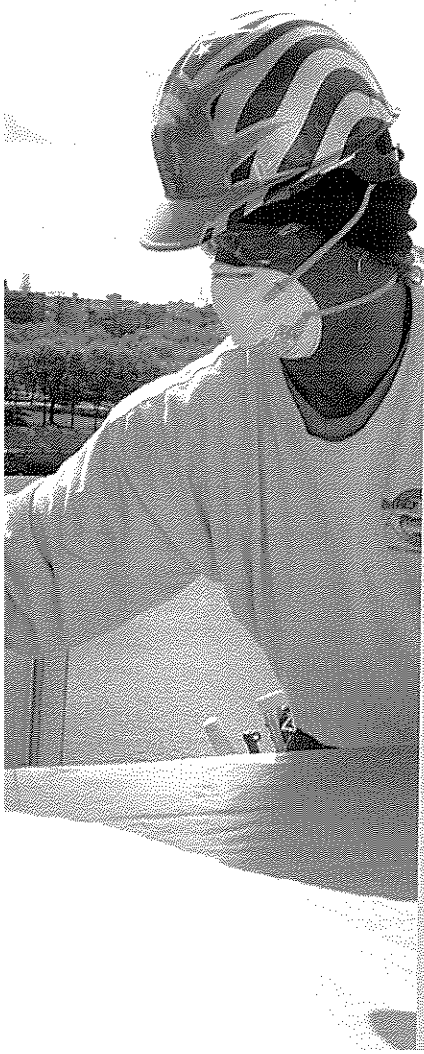
Insulate.....
It's Worth the Energy

Meet Our Workforce

The Heat & Frost Insulators Local Union No. 12 is committed to delivering proper design, installation and maintenance of mechanical insulation and firestopping in New York City and its surrounding areas.

Mechanical insulation services require a skilled and knowledgeable workforce to design and install energy-saving mechanical insulation for any building, large or small. Through increased inspection, enforcement and code requirements, firestopping is now recognized as an integral component in all commercial, residential, and industrial construction projects. Local 12's union workforce completes a wide-range of complex insulation assignments, including industrial and commercial insulation installation, insulation repair, and firestopping and maintenance services of mechanical systems exposed to the environment.

Local 12 is part of an international union of more than 25,000 members and is recognized as one of the largest, most influential union of trained Heat and Frost Insulators and Firestop Workers in the world. Local 12 ensures workers' safety through education and continuous training in advanced application techniques while representing the insulation industry at the federal, state and local government levels.



Quality and Safety on Every Jobsite

Ongoing Skill Training

All Local 12 apprentices and mechanics receive the highest level of training through our NY State approved Apprenticeship Training Program. The program focuses on practical hands-on learning that is reinforced by classroom instruction, as well as the use of textbooks and other course materials to give participants a thorough knowledge of the trade. Each apprentice must complete four years of combined on-site and in-class training on applications including insulation installation, firestopping techniques, safety, codes, specifications, materials and tools, supervision and quality control. Mechanics routinely attend classes to enhance their abilities many times throughout an entire career.

We Build Strong Relationships

The training program helps insulators learn good habits that help build beneficial working relationships with building owners, contractors and public officials. This is accomplished by maintaining a balance of good work ethics, pride and dedication towards increasing the level of energy efficiency of New York's buildings.

Local 12 Is Committed To Safety

In addition to complying with standard jobsite regulations, each Insulator receives a site-specific orientation to recognize potential hazardous activities on each job site and determine necessary corrective actions to protect all parties. Additionally, all Local 12 insulators are required to complete OSHA training courses.

Mechanical Insulation Saves Money, Energy and Jobs

Mechanical insulation is a core component in the design, construction, maintenance and renovation of industrial and commercial buildings. Mechanical insulation can:

- **Dramatically lower operating costs**
- **Improve the environment and enhance sustainability by reducing fuel requirements**
- **Create new and sustainable green jobs**
- **Prevent the growth of harmful mold and mildew**

Mechanical insulation is the most effective solution that will save money and energy while simultaneously protecting the environment. Applying additional mechanical insulation can help achieve greater savings and further reduce maintenance costs.

Did You Know? Just one foot of insulation on a 350-degree pipe can save 15 times more energy and reduce 17 times more carbon dioxide than a fluorescent lightbulb!

Energy Conservation Option	Lbs of CO_2 per Year
1 ft of insulation on 350°F pipe	2,308
1 car, 5% increase in mpg	570
1 compact fluorescent light bulb	130
1 ft of insulation on 180°F pipe	109
1 ft of insulation on 42°F pipe	88
1 tree	50

Mechanical Insulation Provides An Immediate Return to Your Investment

Savings begin the moment mechanical insulation is installed. An investment of as little as $15,000 in insulation may actually save a building owner or user up to $100,000 or more per year in energy costs — sometimes yielding nearly 700% in returns on investment each year. The money saved from mechanical insulation can enhance any company's profit margin by reducing building operation costs. The savings can then be used to pay for capital improvements, hiring additional staff, preventing lay-offs or simply to keep programs open and facilities competitive.

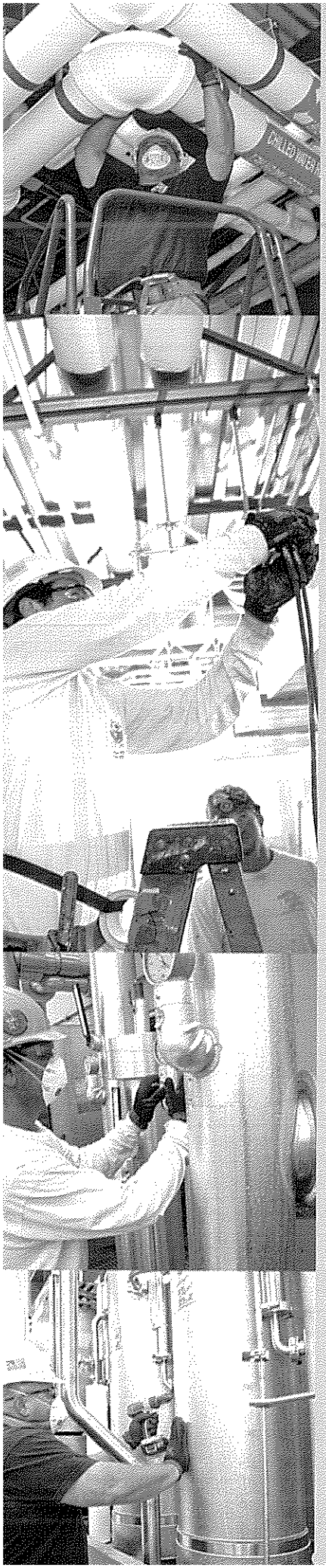
Mechanical Insulation Yields Substantial Savings:

Energy Conservation Option	Energy Savings, *MMBTU Per Year
1 ft of insulation on 350°F pipe	14.4
1 car, 5% increase in MPG	3.7
1 compact fluorescent light bulb	0.9
1 ft of insulation on 180°F pipe	0.9
1 ft of insulation on 42°F pipe	0.6
1 tree	n/a

* Equivalent energy savings in Millions of BTU per year (MMBTU per year) of primary fuel

Become Energy Independent and Achieve Immediate Savings

Commercial and industrial operations account for as much as 39% of the nation's annual energy use. Although insulation is common in residential sectors this type is customarily referred to as blanket insulation and is being used in the building envelope. Because commercial and industrial buildings consume 250% more energy than homes, applying mechanical insulation to the heating and cooling systems is the most effective way to conserve energy. When installed by Local 12 trained craftspeople mechanical insulation conserves energy, reducing overall demand as well as dependence on foreign energy sources and reduces environmental pollutants such as green house gas emissions. The environmental benefits of installing mechanical insulation are also consistent with the Net Zero Energy Commercial Building Initiative (BCI) of 2009 and The American Recovery and Reinvestment Act.



Partnering with Policymakers on Green Initiatives

Local 12 works in partnership with local, state and federal agencies to encourage and promote the inclusion of mechanical insulation in the construction standards of commercial and industrial buildings. We have gained support from legislators and policymakers to amend the Internal Revenue Code to provide tax incentives as encouragement for companies to incorporate mechanical insulation technology in their facilities operation and energy plans. Additionally, $500,000 of the current Energy and Water Development Appropriations Bill has been allocated to jump-start a national education and awareness campaign. The resources will be used to educate professionals such as architects and engineers on the need and the benefits of Mechanical Insulation during the construction process. Our leaders are actively meeting with key organizations and political groups to raise awareness of mechanical insulation's benefits for the environment.

Supporting the Mechanical Installation Incentive Act

The Mechanical Insulation Installation Incentive Act, introduced as House Bill H.R. 184 and senate Bill S.775, as well as New York Sate Senate Bill S02499 and NY Assembly Bill A04414, is a proposed bipartisan, bicameral bill that would cut energy costs, reduce carbon emissions, and put Americans back to work through a tax incentive encouraging the use of mechanical insulation. The bill would create up to a 30% tax deduction to encourage commercial and industrial entities — like manufacturing facilities, office buildings, schools, hospitals, power plants, hotels, and universities — to go beyond minimum mechanical insulation requirements in new construction and retrofit projects and increase their maintenance activities.

Conservative estimates indicate that over a five-year implementation period this legislation could save $35 billion, reduce 170 million metric tons of CO_2, and create more than 25,000 jobs for skilled craftsmen in all 50 states within weeks or months — not years. While similar incentives have been developed for walls, roofing, windows, lighting, and other energy efficiency options, there are no existing tax incentives tailored for mechanical insulation.

What Does Mechanical Insulation Do for Your Building?

To calculate the amount of mechanical insulation necessary for a building to require less energy, reduce plant emissions and improve system process efficiency, owners can consult with a Certified Energy Appraiser who is trained to use 3E Plus®, a software developed by the North American Insulation manufacturer's Association (NAIMA). Local 12 partners with the National Insulation Association to offer an extensive training program focused on leveraging the 3E Plus® software.

These trained energy appraisers are now able to identify all pipes, ducts and equipment that are in need of mechanical insulation and enter the data into the 3E Plus® software. The state-of-the-art software will pinpoint where mechanical insulation can be most effective in reducing the cost of the facilities energy requirements. Local 12 professionals then install materials based upon this energy appraisal on mechanical systems even while they are operational.

Based on data from more than 700 industrial energy assessments, the National Insulation Association estimates that implementing a comprehensive mechanical insulation maintenance and upgrade program in the commercial and industrial market segments would lead to:

- Energy savings of $4.8 billion per year
- CO_2 reductions of 43 million metric tons per year
- Generation of 89,000 jobs

When oil is priced at $58 per barrel, one worker for a single day can save:

- Insulating 45 linear feet of 8-in. high-pressure steam line equates to about $13,600 per year in energy savings, equivalent to removing 13 cars per year from the highways. Assuming the facility exists for 20 more years, the total energy savings from that one workday would be $272,000.
- Insulating 70 linear feet of 3-in. low pressure steam line equates to over $4,000 per year in energy savings, reducing CO_2 emissions as much as removing 3.7 cars from the highways. Assuming the facility exists for 20 more years, the total energy savings from that one workday would be $80,000.

Contact Us Today to Start Saving

The Heat & Frost Insulators invite you to contact us today so that you may learn more about the value of mechanical insulation.

The Heat & Frost Insulators Local Union No. 12

T: (718) 784-3456
F: (718) 784-8357
insulatorslocal12.org

Building Service 32BJ Thomas Shortman Training, Scholarship and Safety Fund
25 West 18th Street
New York, NY 10011-4676

www.32bjfunds.org
212-388-2000

TESTIMONY TO THE NEW YORK CITY COUNCIL COMMITTEE ON HOUSING AND BUILDINGS GREEN CODES LEGISLATION

April 02, 2014

Good morning. My name is Victor Nazario. I am a member of Local 32BJ SEIU and the Resident Manager for The Whitney Condominiums at 311 East 38th Street. 32BJ is affiliated with the Service Employees International Union (SEIU) and is the largest property service workers union in the country, with more than 120,000 members in eight states and Washington, DC. 70,000 of our members are located in New York City and Long Island. Our members include residential building service workers, security officers, doorpersons, window cleaners, and maintenance workers. 32BJ SEIU is dedicated to helping its property service workers elevate their socioeconomic standing by winning better compensation, job security, and education and resources.

Although we support the Green Codes initiative headed by the New York City Urban Green Council, we are still evaluating the legislative package in front of you and will give you specific comments at a later time. However, I would like to take this opportunity to discuss one aspect of this legislation – the need for training building operators in energy efficiency.

Over the course of my 20 years in the building service industry, I have learned that installing expensive equipment and automated systems can be important to building operations but it doesn't always translate into greater efficiency. The best investment for efficiency is in the people who run the buildings. It doesn't matter how much money a building invests in an automated system if the staff is not involved or trained in its operation. As a superintendent I am the eyes and ears of the building. I know the nuances of my building and I am often the first person to know if something is wrong. But one thing is clear - the building service and maintenance industry is changing and becoming more complex in nature, and we as building operators need to grow and evolve with these changes.

32BJ has had the foresight and insight to provide cutting edge courses and training in "green buildings" strategies for its members. And as a member, I have been privileged to take these pivotal and timely classes, and this has given me the needed information and knowledge to work alongside the Board of Directors of the Whitney Condominiums in the process of making their building more energy efficient. My job is not only about keeping a building clean and safe - it is about managing energy. If you want to make buildings more energy efficient, the operators need to learn the strategies and concepts that will empower them to find the best policies and technologies for their buildings.

Over the last several years, the 32BJ Training program has developed a basic Green Supers training course to help keep our workforce competitive. With support from the Realty Advisory Board and major property management companies, we have trained over 2,000 of our members. The course covers Green Building strategies on the building envelope, lighting efficiency and controls, HVAC efficiency strategies and indoor environmental quality. And our training gives our members the opportunity to earn industry certification as energy efficient building operators.

But beyond the training, our members apply what they learn to their buildings. And I should know since I am not only a 32BJ union member but I am also an instructor for the 32BJ Training Fund. I can tell you first-hand that training can transform a building operator into a strong advocate for making a building more efficient and healthy, saving money for the building, improving the quality of life for the residents and reducing our carbon footprint on future generations. In a survey of 1,000 members who completed our Green Supers training, 64% reported making improvements to their buildings ranging from upgrading lighting to improving the building envelope to reducing water use and more. Our union members went back to their buildings and found the low cost/no cost opportunities, such as installing a lighting sensor or insulating pipes. They learned how to test the performance of their boiler, how to track water use through submeters and how to maintain logs on their mechanical systems. And they understood how repairing an old boiler or fixing broken lighting fixtures can be an excellent opportunity to upgrade to more efficient equipment.

I hope these comments are useful in your evaluation of the legislation before you. Again, we will follow up with any specific comments on this legislation at a later time. I am happy to answer any questions you may have about our Green Building training program.

GREEN SUPERS

A FREE TRAINING PROGRAM FOR ELIGIBLE MEMBERS

THE LOCAL 32BJ THOMAS SHORTMAN TRAINING FUND announces a green building initiative for superintendents, resident managers, and handypersons on green strategies that can help lower your building's operating costs.

- Learn to increase your building's efficiency by:
  - Reducing energy use
  - Improving HVAC system performance
  - Reducing water & domestic hot water usage
  - Improving indoor air quality
- Prepare for a changing world by learning about:
  - Energy benchmarking
  - Green cleaning
  - Cleaner fuels
  - Green standards and labels
- 40 hour program tailored to your needs
- Flexible scheduling is available, multiple class times and locations are offered, on-site training is an option
- Access to green coaches who will guide you as you make approved upgrades to your building
- Prepare for industry recognized certifications:
  - Building Performance Institute, Energy Efficient Building Operator
  - Urban Green Council (USGBC-NY), G-Pro Operations and Maintenance

CONTACT US TODAY!

(212) 388-3220 / 1000supers@32bjfunds.com / www.1000supers.com
Thomas Shortman Training Fund / 101 Avenue of the Americas, New York, NY 10013-1991

The 1,000 Green Superintendents program is funded in part by a $2.8 million dollar American Reinvestment and Recovery Act grant from the U.S. Department of Labor. This grant represents 50% of the total program costs.

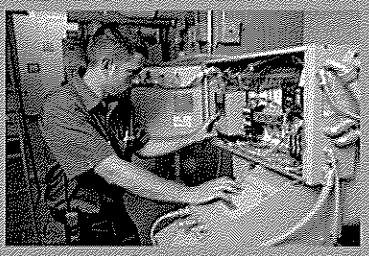
GREEN SUPERS

PROGRAM CURRICULUM

1. Building Science & Building Envelope — Covers the fundamentals of building science and examines a 'whole-building' approach to operations and maintenance. Topics include air movement, heat transfer, and relative humidity. It also covers the core area of the building's envelope and explores ways to keep conditioned air from escaping to the outside environment. Topics include air barriers, vapor barriers, thermal barriers, air sealing, insulation, pressure boundaries, and compartmentalization.

2. Lighting — Covers all aspects of lighting. Topics include lighting types, quality, efficiency and controls. The unit also discusses appliance efficiency ratings.

3. Heating, Ventilation & Air Conditioning (HVAC) — Covers the essentials of running a building's heating, ventilation, and air conditioning system. Topics include combustion science, combustion efficiency, boilers, controls and distribution as well as efficiency strategies for each of these areas.

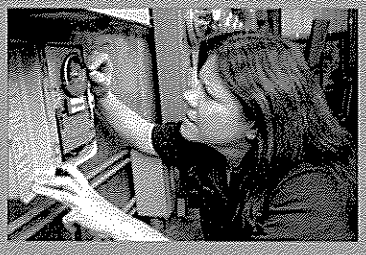


4. Field Exercise (HVAC): Mechanical Room and Roof — Onsite visit to a building's machine room and roof where instructors will teach supers how to perform steady state efficiency tests, maintain rooftop ventilation equipment, and apply efficiency strategies and best practices.

5. Indoor Environmental Quality — Covers the indoor atmosphere of a building. Topics include strategies to avoid and limit indoor pollutants, including tobacco smoke, mold, asbestos, toxic compounds, and pest control. Strategies include green cleaning, green purchasing, and more.

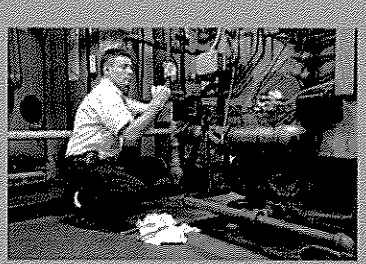
6. Water Conservation — Covers the essentials of water use and water conservation strategies. Topics include understanding water use, low flow appliances, leak detection, and leak repair.

7. Field Exercise: Hallway, Lobby, Apartment — Onsite exercise where supers learn how to inspect an apartment, evaluate hallways and common areas, and inspect the building's envelope.



8. Utilities & Energy Benchmarking — Covers measuring and managing energy use by understanding and working with utility bills (fuel, gas, electricity, and water). Topics include reading and understanding bills, energy benchmarking, recognizing unusual energy use (trends), and identifying opportunities for savings.

9. Green Building Work Plan — Students develop a basic action plan for improving their buildings based on concepts and strategies taught in earlier units. In addition, the class also discusses strategies and techniques to communicate effectively with building owners, tenants, and staff on your action plan, including payback and incentives for improvements.



10. Review & Practice Exam — A review and a practice test are given to help prepare for the BPI certification exam.

At the end of the training students have the option of taking the Building Performance Institute Energy Efficient Building Operator Certification exam. Also, included in the training is the Urban Green Council Green Professional (GPRO) Operations & Maintenance certification exam.

32BJ EDUCATION & SAFETY

The *Green Supers* Program

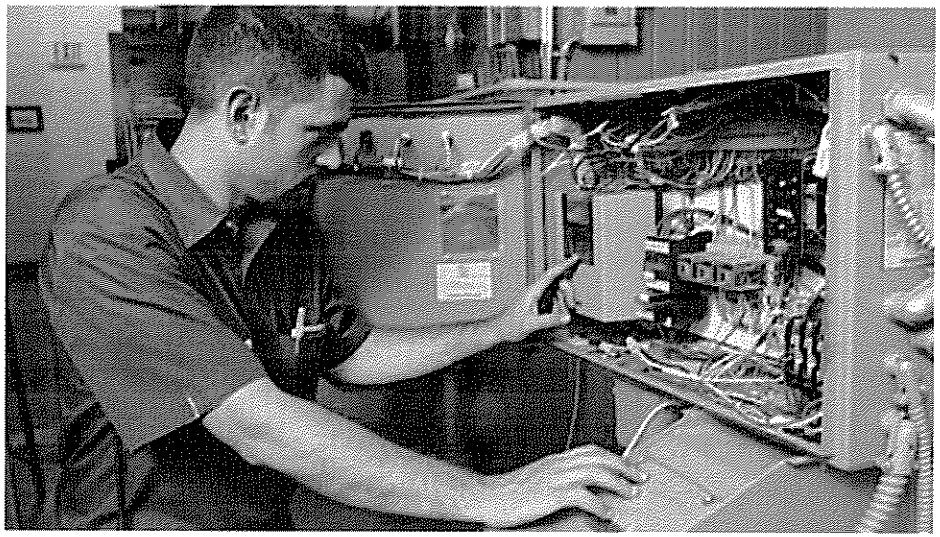
Leading a new era of energy-efficient building management

Steven Winter Associates, Inc.
Improving the Built Environment Since 1972

32BJ SEIU and the *Green Supers Program*

The 32BJ Training Fund: creating an energy-efficient culture

Since 2005, this joint labor-management training fund has been greening New York City's buildings by training property service professionals who are members of 32BJ SEIU. Every year the Training Fund provides industry, academic, and computer courses to thousands of 32BJ SEIU members, with programs covering subjects ranging from boiler certification to Occupational Safety and Health training. The Training Fund is the entity that directly oversees the *Green Supers Program*.



The *Green Supers* Program: fostering a greener New York City through rigorous worker training

In New York City, 70% of greenhouse gas emissions results from building energy usage. While the focus in combating the growth of building energy consumptions has historically been high-efficiency building system improvements, these interventions are only half of the story. Research shows that building operations and maintenance are critical means by which we can impact building energy consumption. **A U.S. EPA-funded study states that enhancing the operational efficiency of lighting and HVAC systems can save between 5% and 20% on building energy costs.**[1] To capitalize on this opportunity, the 32BJ Training Fund created the *Green Supers* Program.

> ***"...Enhancing the operational efficiency of lighting and HVAC systems can save between 5% and 20% on building energy costs..."***

32BJ Training is uniquely positioned in the industry to access both property service workers and the management companies that employ them. When 32BJ Training committed to launching an innovative, holistic training program, it set a goal of training property service workers to give them a comprehensive approach to energy management in buildings. The immersive 40-hour course, which prioritizes hands-on training, surpassed its goal in the first year of operation. Rather than stopping at 1,000 members, 32BJ Training has continued to provide property service workers with the training needed to lead a new generation of "green supers." To date **1,800** property service workers have completed the course and **1,600** have received certification.

[1] PECI, Fifteen O&M Best Practices, prepared for U.S. EPA and U.S. DOE, Sept. 1999.

Leveraging partnerships to build an effective program

The *Green Supers* Program has thrived in part because of its unique approach to teaching efficient building management, but also because of the support the program has received from partner organizations and programs.

32BJ SEIU: 32BJ is affiliated with the Service Employees International Union (SEIU) and is the largest property service workers union in the country, with more than 120,000 members in eight states and Washington, DC. 70,000 of its members are located in New York City and Long Island. Union members include residential building service workers, security officers, doorpersons, window cleaners, and maintenance workers. 32BJ SEIU is dedicated to helping its property service workers elevate their socioeconomic standing by winning better compensation, job security, and education and resources.

The Realty Advisory Board: The Realty Advisory Board on Labor Relations, Inc. (RAB) is a multi-employer association serving the real estate industry in the Tri-State area that negotiates collective bargaining agreements on behalf of owners and operators of real property. Working with 32BJ SEIU, the RAB has helped to strengthen the *Green Supers* by promoting the opportunity to send employees to the program to large building owners and managers in the New York City area.

The American Recovery and Reinvestment Act (ARRA): ARRA, commonly known as the Stimulus or Recovery Act, was passed in 2009 to provide economic and financial support to critical American organizations and institutions. 32BJ Training was the recipient of a grant under ARRA, which has been a catalyst for tremendous organizational growth. The funding provided by ARRA has allowed 32BJ Training to provide an expanded range of programs and services to property service workers in the New York City area.

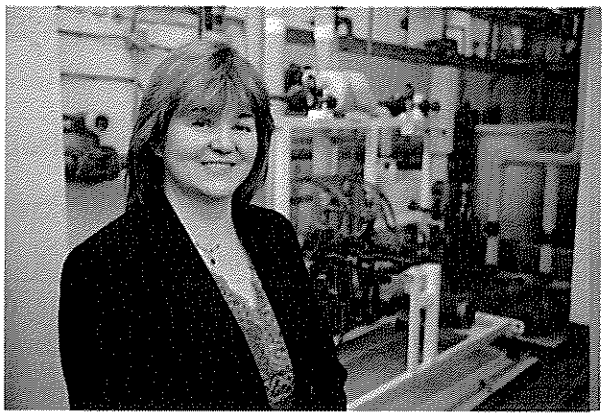
Assessing the impacts of the *Green Supers* Program

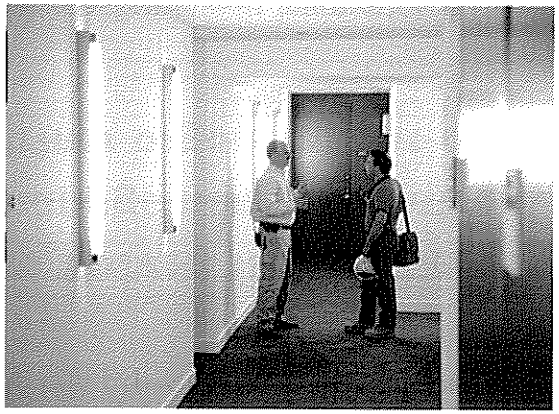
32BJ Training Fund retained Steven Winter Associates (SWA) to complete an assessment of the impacts of the *Green Supers* Program. SWA conducted an exhaustive study, including:

- Interviews with 38 program graduates
- Analysis of 902 surveys conducted by 32BJ Training
- Visits to 18 buildings operated by program graduates
- Building energy consumption analysis for 43 buildings
- 4 whole-building case studies of energy efficiency improvements implemented by program graduates
- 5 isolated energy conservation measure case studies showcasing implemented sustainability strategies

SWA coordinated with 32BJ Training staff throughout the assessment to capture the diversity of ways in which the *Green Supers* program has impacted property service workers and the buildings in which they work. SWA's measurement and verification evaluation showed parallel conclusions to the EPA study: **5% to 20% energy savings are achievable by improving operational efficiency.**

Over the course of the assessment, SWA worked with 32BJ Training staff to identify 38 program graduates to participate in phone or in-person interviews to discuss their perception of the program. These property service workers were selected based on 32BJ Training's recommendations for program participants that were most engaged and showed the most sophisticated understanding of the concepts related through the program.





A transformational impact on the property service industry

The Green Supers program is the first training program to teach 32BJ SEIU members a truly comprehensive approach to sustainable and energy efficient building operation. Participants in the program combine in-the-classroom sessions with hands-on field exercises.

The *Green Supers* program is the first program to offer 32BJ SEIU members the opportunity to learn a truly comprehensive approach to sustainable and energy efficient building operation. Participants in the program combine in-the-classroom sessions with hands-on field exercises. The 40-hour course's ten modules include:

- Building science and envelope
- Lighting
- Heating, ventilation, & AC
- Indoor environmental quality
- Water conservation
- Energy benchmarking

Of 38 graduates interviewed...

75% **had positive feedback on the program.** Property service workers that completed the program highlighted a range of benefits, from an improved understanding of building systems to increased confidence in advocating green investments to key decision makers.

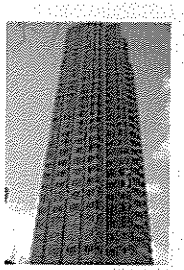
30% **have persuaded other building staff to enroll in the program.** The success of the program is evident in the rate at which graduates are referring their peers to the program, and the rate at which these peers are actually enrolling to complete the training. This effect will be exponential as the program continues to grow.

The program organized 180 classes, providing 7,200 hours worth of training including certification. Overall, 2,061 union members enrolled in the program and 87% of these members completed the training. Of the members who completed the training, 87% attained BPI certification and/or the Urban Green Council Green Professional (GPRO) certificate.

Case Study

The Green Supers "trickle down" effect

Sean Wade, The Future, 200 E 32nd St., New York, NY



Sean Wade, resident manager for the 35-story condo building, The Future, completed the *Green Supers* program in 2010. In addition to training his building staff to install high-efficiency heat pumps, Wade also organized a seminar for building tenants on how to operate the new heat pumps. Wade's new expertise allowed him to further reduce energy consumption by training his tenants to operate their equipment more efficiently.

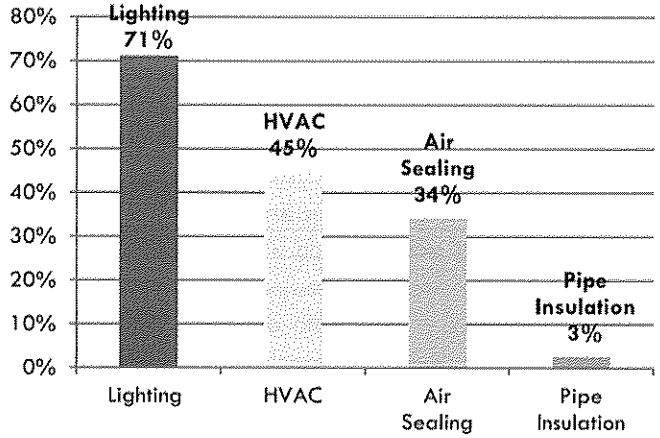
Empowering property service professionals to create change

Program graduates stated that they benefited not only from an expanded skill set, but also from increased capacity to communicate energy efficiency issues to building decision makers, leading to the successful implementation of a range of efficiency measures.

Of 38 graduates interviewed…

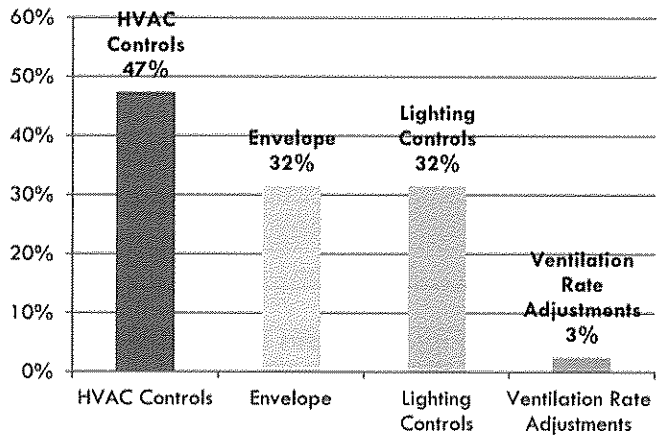
95%

installed energy efficiency upgrades within a year of graduating the program. While the majority of measures were related to lighting, program graduates also pursued measures that are typically more capital-intensive such as HVAC and building envelope improvements. These latter installations are indicative of both increased ability to communicate with capital decision makers and the potential for more energy efficient capital investment in the future.



80%

made green operations & maintenance (O&M) changes within a year of graduation. O&M changes, such as changing lighting operation schemes or adjusting HVAC controls, result in saving money and energy immediately.



Training that leads to measurable outcomes in buildings

Of 38 graduates interviewed...

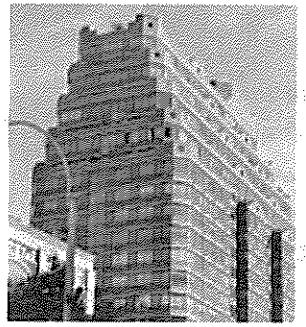
25% **switched to using green cleaning methods and products.** The holistic approach to green building management looks beyond installation of energy-saving measures that require a large capital investment, encouraging property service workers to implement changes that they can do quickly and at little cost.

40% **reported that tenants are now more willing to embrace greener building operations practices.** The skills that program graduates learned have allowed them to not only tailor their practices to be greener, but to encourage additional changes through influencing tenant behavior.

"Training helped me understand there is a legacy. I'm now teaching my other brothers and sisters what I learned."
- Victor Nazario, Resident Manager

Case Study

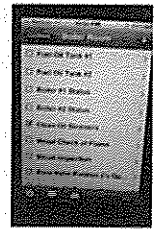
Applying the lessons of the Green Supers Program



In the 2 years since completing the *Green Supers* program, resident manager Charles Hynes has implemented a range of energy conservation measures and sustainable O&M practices at The Bromley, a 23-story condo building.

Upon completing his training, Hynes first completed a lighting audit of the building. Following the audit's recommendations, he upgraded lighting through the building and installed LEDs in common areas. Further, Hynes and his team implemented a comprehensive building envelope retrofit to reduce HVAC costs.

To fulfill a more energy efficient building operations regimen, Hynes adopted a smart phone-based technology that allows him and his team to maintain a shared log book that they can access online and update in real time.



These and other improvements cost $110,000 to implement and will save The Bromley approximately $40,000 each year, translating to a simple payback period of less than three years.

Equipping property service professionals to be industry leaders

The Green Supers program will benefit graduates and the buildings they serve for years to come.

Case Study

Empowering property service workers to make real change

John Sarich, superintendent of the 47-story William Beaver House, was inspired by what he learned during his training at the *Green Supers* program to test an aggressive lighting retrofit in his building's parking facility. When the savings from the retrofit paid back the cost in one month, Sarich knew that this was an opportunity to achieve major cost and energy savings for his whole building.

Sarich went on to do lighting retrofits in the building's stairwells and in other common spaces, such as the gym and the recycling room. He also adjusted indoor temperature setpoints in the whole building.

The lighting measures cost $8,500 to implement and are saving the building approximately $22,000 a year., translating to a simple payback period of less than six months.

"The entire experience convinced me of how important going green is – it opened my eyes."

- George Dushaj, Resident Manager

The success of the *Green Supers* program has been predicated on the belief that the shortest and most effective path to creating real change in building management practices is to focus on training incumbent workers. These workers, who already have years of experience in the field, are able to quickly apply the concepts they learn to the management of the properties for which they work. Facilitating a swifter transformation of industry practices is not only beneficial to the buildings, but also to the workers, who are equipped to earn better benefits and retain their positions in a competitive job market.

> ***"Facilitating a swifter transformation of industry practices is not only beneficial to buildings, but also to workers..."***

Of the 902 program graduates surveyed...

54% **Reported that building tenants now view them as a resource for energy efficient building practices.**

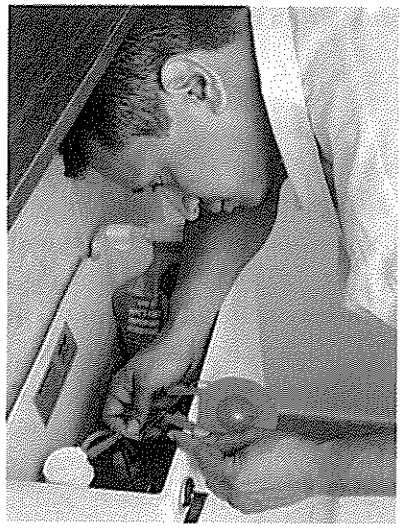
36% **Reported having received positive recognition on energy efficient improvements from building tenants or other decision makers.**

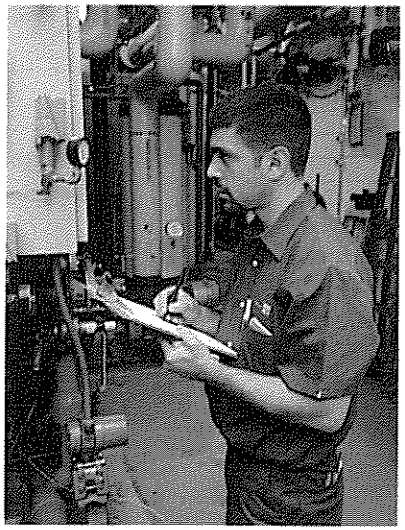
Setting the trajectory for a new era of property service practices nationwide

The *Green Supers* program has the potential to be scaled in New York and replicated nationwide.

As the program matures, 32BJ Training has set it sights on opportunities to bring the benefits of the program to a wider audience and to continue to develop the capacity of the program to respond more directly to the needs of its members. There are a range of potential expansions to the program that could help to elevate the program to the next level in terms of its offerings. Green Supers graduates and program evaluators identified the following opportunities for project scaling:

- Training modules to satisfy different levels of experience, allowing the pace of the course to match the varied skill level of the participants;
- Courses that focus several training sessions exclusively on one building system, providing an enhanced level of detail
- A greater number and increased intensity of field trips to apply concepts covered in the training sessions;
- Supporting resources to encourage energy analysis and implementation, such as development of a simple checklist for easy-to-install measures.





"The whole program was great! I wanted to thank them for changing the whole way that we resident managers look at the world – especially the micro world that we inhabit."

- Judd Cady, Resident Manager

The rationale for continued program growth

Building tenants, property service professionals, investors, and policymakers invested in sustainability and economic growth should care about energy efficiency.

The *Green Supers* Program equips property service workers to improve the financial viability of their buildings, spur positive economic investment, and help achieve greenhouse gas reductions targets.

Energy retrofits unlock a range of benefits for building residents.

Retrofits bring direct energy savings to residents and building managers, help avert future rent increases, and improve conditions for building occupants. These savings generate additional economic activity by providing an opportunity for increased spending by residents due to reduced energy expenditures.

Retrofits also help improve the health, safety and comfort of building tenants, including improved indoor environmental quality and better tenant mental and physical health outcomes.

Energy retrofits create jobs and have broad economic impacts.

A number of studies document the broad, industry-wide economic impacts of energy efficiency, including the additional spending, savings, and job creation. Two studies, employing rigorous methodology, estimated approximately 10 jobs created per million dollars of comprehensive energy efficiency retrofits in multifamily buildings.[2]

Energy retrofits reduce greenhouse gas emissions.

Buildings are responsible for 70% of New York City's greenhouse gas emissions. A comprehensive strategy to reduce our city's carbon footprint begins with improving the efficiency of our building stock. **Effective building operations are a critical means to ensure building efficiency, as studies have shown that an energy reduction of 5% to 20% is achievable through improving operational efficiency.**[1] Through initiatives such as the *Green Supers* Program, cities can reduce greenhouse gas emissions, improve the environment locally and globally, and ensure a better future for generations to come.

The *Green Supers* Program is not only a proven model here in New York, but is also scalable nationwide. The expansion of the curriculum to other markets provides the opportunity to educate property service workers everywhere, significantly improving the energy performance of our nation's building stock.

[2]Booz, Allen, and Hamilton. "US Green Building Council Jobs Study", 2009. ECONorthwest and Bonnie Gee Yosick LLC. "Economic Multipliers and Metrics for Green Sector Strategies and Green Industries in Oregon", 2010.

Contact

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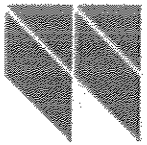
New York, NY 10011
212-388-3220
1000supers@32bjfunds.com
www.1000supers.com



Steven Winter Associates, Inc.
Improving the Built Environment Since 1972

The *Green Supers* program was partially funded by a grant awarded by the U.S. Department of Labor's Employment and Training Administration. This program was created by the grantee and does not necessarily reflect the official position of the U.S. Department of Labor. The Department of Labor makes no guarantees, warranties, or assurances of any kind, express or implied, with respect to such information, including any information on linked sites and including, but not limited to, accuracy of the information or its completeness, timeliness, usefulness, adequacy, continued availability, or ownership.

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☒ in opposition

Date: _____

(PLEASE PRINT)

Name: Josh Gold

Address: _____

I represent: Hotel TRADES

Address: _____

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THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 022 Res. No. 021

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Christine Johnson, DOHMH

Address: _____

I represent: DOHMH

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☒ in opposition

Date: 4/2/14

(PLEASE PRINT)

Name: Angela Pinsky

Address: 570 Lexington Ave

I represent: Real Estate Board of NY

Address: 570 Lex.

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THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 13 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

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Name: HOWARD STYLES

Address: _____

I represent: LOCAL 94 TRAINING CENTER

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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☐ in favor ☐ in opposition

Date: 4/2/14

(PLEASE PRINT)

Name: MARIE KERR

Address: 720 Greenwich St - 9F NYC

I represent: NRDC

Address: 40 W 20 St NYC

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Mary Ann Rothman

Address: 110 Riverside Drive NY 10024

I represent: CNYC - Council of NY Cooperatives & condominiums

Address: 250 W 57 St #730 NY 10107

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THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 16 Res. No. 316

Green Bill ☒ in favor ☐ in opposition

Date: APRIL 2 2014

(PLEASE PRINT)

Name: MATTHEW ARACICH

Address: 35-53 24TH ST, LONG ISLAND CITY NY 11106

I represent: HEAT, FROST INSULATORS

Address: 35-53 24TH ST, LONG ISLAND CITY NY 11106-4416

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

General Statement *Date:* 4/2/14

(PLEASE PRINT)

Name: Victor Mazariego

Address: _____

I represent: 32BJ

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Howard Styles

Address: 331 West 44th St.

I represent: I.U.O.E. Local 94

Address: 331 West 44th St NY, NY 10036

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. N/A Fire Protection & Const. Site Safety Res. No. N/A

☒ in favor ☒ in opposition

Date: 4/2/2014

(PLEASE PRINT)

Name: [illegible] Rangel (EC DIRECTOR)

Address: 3258 N. [illegible] Ave, NY, NY 10282

I represent: Nat'l Electrical Contractors Assoc + NYE Chapter Architects

Address: 1430 Broadway NY, NY 10018 NEW YORK

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. ________ Res. No. ________

☒ in favor ☐ in opposition

Date: ________

(PLEASE PRINT)

Name: RUSSELL UNGER + CECIL SCHEIB

Address: 20 BROAD ST STE 709, NY, NY 10005

I represent: URBAN GREEN COUNCIL

Address: SAME

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. green codes Res. No. ________

☒ in favor ☐ in opposition

Date: 4/2/14

(PLEASE PRINT)

Name: Ya-Ting Liu

Address: 30 Broad St. 30th Fl 10004

I represent: New York League of Conservation Voters

Address: ________

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THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: John Lee

Address: _____

I represent: Office Long Term Planning

Address: 253 Broadway

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Tom Eisele

Address: _____

I represent: Office Long Term Planning

Address: 253 Broadway

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Donald RANSHE

Address: Director

I represent: Dept of Buildings

Address: 280 Broadway

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: James Colgate

Address: Assistant Commissioner

I represent: Dept of Buildings

Address: 280 Broadway

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: VICTOR NAZARIO

Address: 311 E. 38 ST NYC NY 10016

I represent: Union 32BJ SEIU

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 14 Res. No. _____

☐ in favor ☒ in opposition

Date: April 2, 2014

(PLEASE PRINT)

Name: Dwayne Andrews

Address: Cozen O'Connor, 277 Park Avenue, NY, NY 10172

I represent: American Council of Engineering Companies of NY

Address: 8 W. 38 st, Suite 1101, NY, NY 10018

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 202 & 203 Res. No. _____

☒ in favor ☐ in opposition

Date: 4/2/14

(PLEASE PRINT)

Name: RICK BELL (EXEC DIRECTOR)

Address: 536 LAGUARDIA PL

I represent: AMERICAN INSTITUTE OF ARCHITECTS

Address: NEW YORK

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 202 & 203 Res. No. _____

☒ in favor ☐ in opposition

Date: 4/2/14

(PLEASE PRINT)

Name: DAVID BURNY

Address: 222 BROADWAY, 19TH FLOOR, 10038

I represent: CENTER FOR ACTIVE DESIGN / FORMER DDC COMMISSIONER

Address: _____

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 13 Res. No. _____

☒ in favor ☐ in opposition

Date: 4/2/14

(PLEASE PRINT)

Name: NORA SHERMAN

Address: 94 E. 4th St #202 NYC 10003

I represent: CUNY BUILDING PERFORMANCE LAB

Address: 137 E. 22nd St. #315 NYC 10010

Please complete this card and return to the Sergeant-at-Arms

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. _____

☐ in favor ☑ in opposition – for some

Date: 4/2/14

(PLEASE PRINT)

Name: HANI SALAMA

Address: 230 PARK AVE · NYC. 10169

I represent: BOMA (Building Owners & Managers Assoc.)

Address: _____

Please complete this card and return to the Sergeant-at-Arms