

The City of New York
Mayor's Office of Sustainability
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June 22, 2016

Testimony of Nilda Mesa

Director, Mayor's Office of Sustainability

Before the New York City Council Committee on Housing and Buildings

Hearing on Introductions 1160, 1163, and 1165

in Relation to Amending Local Laws 84 and 88 of 2009

Introduction

Good morning, Chairman Williams and members of the Committee on Housing and Buildings. My name is Nilda Mesa and I am the Director of the New York City Mayor's Office of Sustainability. Thank you for the opportunity to testify today regarding Introduction ["Intro"] 1163, which would amend the City code for buildings required to submit annual energy and water benchmarking reports, as well as Introductions ["Intros"] 1160 and 1165, which would amend the City code on upgrading lighting systems and installing sub-meters in certain buildings, respectively. These Introductions propose amendments to Local Law 84 of 2009 and Local Law 88 of 2009, both cornerstones of the City's greenhouse gas reduction and buildings strategy as well as Mayor de Blasio's OneNYC plan.

This past year has seen many landmarks in the global fight against climate change. In December 2015, 165 countries committed to reducing carbon emissions so as to achieve less than two degrees Celsius temperature rise this century. The agreement allows countries to employ flexible means to meet their goals, but also requires countries to report on metrics and progress towards the goal. This historic agreement was signed here by 176 countries in New York City on Earth Day of this year at the UN, and already ratified by 18. Last week marked the

one year anniversary of the Pope's encyclical, *Laudato Si*, in which he called for aggressive and unified global action to combat climate change. Mayor de Blasio was honored to join mayors from all over the world at the Vatican at that time in support of the urgency of the Pope's message. At the City level, the Mayor released a sweeping buildings plan in the update to OneNYC, which employed a data-driven approach to making NYC's buildings energy efficient in effective and cost-saving ways.

Climate change is an existential threat to humanity and we are already feeling its impacts. Bold action is necessary if we are to address this threat and protect our city and our place on this planet. But this action must be measured and effective. The best way to ensure that our strategies will be successful both technically and economically is through the wise use of data. These three bills will expand the scope of laws pertaining to [1] annual energy and water use benchmarking, [2] upgrades to lighting systems, and [3] sub-meters in non-residential tenants occupied spaces. In focusing on effective and economical measures along with the data to support intelligent planning, these bills will significantly advance New York City's contribution to solving the global challenge of combating climate change.

2. The Value of Data

New York City is a global leader in data driven climate action planning, and other cities and nations look to us for guidance for their own programs. This is especially significant as cities are where the rubber meets the road on climate as well as so many other issues. Cities generate at least 70% of worldwide greenhouse gas emissions. Earlier this month, the US State Department and the Government of China hosted the US-China Climate Leaders Summit, and invited me to present specifically on how New York City uses data to inform carbon reduction policy. Our efforts were received with great interest and praise, and were seen as a model. Cities learn from each other, and our friendly competition leads to innovation, which is what we need to achieve our carbon reduction goals worldwide.

Our data efforts to date have focused on three areas: 1) greenhouse gas emissions, 2) building energy and water consumption, and 3) energy audits. The data from these efforts is rich, and has played a significant role in our ability to identify effective and cost-saving strategies for reducing energy in the City. However, our ability to assess the feasibility and effectiveness of strategies would be greatly enhanced by including more categories of data.

New York City is one of the very few cities that collects greenhouse gas emissions data annually, and has done so since 2007. The City has one of the world's largest and most detailed data sets on energy and greenhouse gas emissions of any jurisdiction. The collection of this data enabled us to determine that 73% of our greenhouse gas emissions are derived from buildings, and how they are operated. This is far greater than the US average, which hovers at about a 40% share for buildings. Knowing that buildings make up such a large share gives us clear direction towards a successful strategy to meet our 80x50 goals, without wasting valuable time and resources guessing what will work or focusing on the wrong sector.

The data collected under the City's benchmarking ordinance required by Local Law 84 has been a treasure trove of information on real life buildings and how they use energy. We use the data in several ways. It's been the foundation for our Energy and Water Performance Tool, an online resource that allows anyone with an address to see how a building that is within our database compares to other buildings of its type, location and even citywide. The tool has the potential to empower residents and those in the building industry to make wise choices.

We also used the data to develop the most comprehensive buildings energy efficiency initiative to date, which the Mayor released on Earth Day of this year. The plan is based on the *One City: Built to Last Technical Working Group Report*. We identified 20 building typologies, categorized by age, size and use of building, from which we identified the eight most common typologies. We were able to filter and analyze the data by building typology to evaluate a range of strategies for cost and effectiveness in reducing greenhouse gas emissions, along with the most sound pathways that building owners could use to make their buildings work better and be more comfortable for themselves and their tenants. Without data on energy consumption, age, location, use type, and size of buildings, our office could never have completed this work.

The data available for this report was richest for buildings over 50,000 square feet because they fall within the current Local Laws 84 and 87 of 2009. Key insights from this data include that large office buildings built in the 1970s tend to be much less energy efficient than those built in the 1920s, and that multifamily buildings account for 64% of the energy used by large buildings. We found vastly different patterns of greenhouse gas emissions between multifamily residential buildings and commercial buildings, with 74% of multifamily building emissions due to thermal loads like heat and hot water while commercial building emissions

were more evenly distributed amongst heating and cooling systems, lighting and plug loads. We also estimated that even with new construction 90% of the buildings that exist today will still be here in 2050. These types of insights are critical to shaping targeted, effective policy.

On the operational level, we use benchmarking data to identify buildings that would be most likely to benefit from the Retrofit Accelerator, our program to provide free technical support and information to building owners on energy efficiency strategies. Benchmarking data we have to date allows us to reach out to the buildings that we can see are not performing as well as they could be, compared to similar buildings in the City. We can target those buildings with the greatest potential to save on energy and greenhouse gas emissions because of this data, and get them the tools they need to cut through red tape and get to the resources available. Expanding the data to include buildings down to 25,000 square feet will enable us to help them as well.

3. Intro 1163

Local Law 84 plays a fundamental role in helping building owners and policymakers alike understand energy and water consumption and identify opportunities to reduce energy use and greenhouse gas emissions. Local Law 84 requires large buildings over 50,000 square feet to annually report energy and water consumption. With this information, building owners and managers can better understand which retrofits and management practices could cut costs and increase tenant comfort moving forward.

Intro 1163 would expand the annual reporting requirement to buildings above 25,000 square feet, adding an estimated 10,460 properties across the five boroughs, covering over 367 million square feet of real estate, or roughly 7% of the built floor area in New York City. This would add important and valuable visibility into the nature of energy and water consumption in these mid-sized buildings.

The process of benchmarking is relatively straightforward. Using the federal Environmental Protection Agency's Portfolio Manager free online platform, building owners enter their building's previous year's energy and water bills, much as one would in tax and accounting home software only with many fewer entries. Where the building owner does not have records on hand, City utilities have developed dedicated services to provide this information on request. Once this information is inputted into Portfolio Manager, users can compare the efficiency of their buildings to that of buildings nationwide. They also use this tool

to transmit this data to the City. These steps can be done by a building owner, or any person on behalf of the building owner, including staff, volunteers, or third-party service providers. This is a powerful management tool, and can point out where systems may be underperforming. Knowledge is power. It is why the City benchmarks at an even much lower size -- to 10,000 square feet.

While in most cases the process should be straightforward, we recognize it could be better, especially for certain building types and groups of building owners with limited staff and resources. Our office is committed to lowering the burden placed on building owners and we are dedicating resources to ensure that compliance is a smooth process. It is philosophically similar to the approach we pioneered with Clean Heat, where we helped building owners find the best way to phase out polluting heating oils with enough time that we achieved a 100% compliance rate by the deadline for enforcement. We would like to see the data entry process be automated, with data going directly into the system. We're already part of the way there. On water, the Department of Environmental Protection already provides access to annual water data for free to its customers, with no need for building owners to input the data manually. On energy, we have a bit more work to do. Although data is provided for free by utilities in other jurisdictions, Con Edison is the only utility requiring a fee and currently charges \$102.50 per property each year. For the last year or so, the Mayor's Office has been actively engaging Con Edison and the Public Service Commission to eliminate this fee. This spring we submitted testimony in the pending Con Ed rate case before the Public Service Commission advocating that this data be automated and free, as is done in cities such as Philadelphia and Chicago. Furthermore, we are also actively working with the utilities to automate the process to get data from the utilities directly into the reporting tool without requiring the building owner to input it manually.

Additionally, this year we established the New York City Benchmarking Help Center to be available year-round, on a full-time basis. For any building owner who has questions about deadlines, is unsure whether or not their building is covered by the law, or needs help navigating the Portfolio Manager website, the dedicated team at the Help Center is there to answer questions and provide guidance. These trained staff members know every step of the process and can offer tailored support. The Help Center also provides guidance on how to make the best use of the information and to benefit from its value.

We are also committed to helping building owners take the next steps *beyond* benchmarking to achieve energy and cost savings and occupancy comfort by retrofitting their buildings through our Retrofit Accelerator and Community Retrofit NYC programs. Among these programs' many components, Retrofit Accelerator and Community Retrofit NYC provide direct, one-to-one assistance to coordinate compliance with Local Law 87, assist building owners interpret their benchmarking results, identify energy and water efficiency upgrades best suited for their buildings, and monitor the results of their projects. All told, these resources represent just a small portion of our office's, and Mayor de Blasio's, commitment to ensuring that these laws are easy to comply with and produce real financial and sustainable results.

Benchmarking is already changing the ways building owners manage their properties. Through the NYC Carbon Challenge, the Ridgewood Bushwick Senior Citizen's Council in Ridgewood-Bushwick, and the Lott Community Development Corporation and Harlem Congregations for Community Improvement in Harlem, have benchmarked close to 100 properties totaling nearly 1.4 million square feet to measure their implemented energy conservation measures in addition to controlling utility costs. Energy makes up a disproportionately large share of community organization budgets, and these have seen benchmarking to be a powerful tool in helping them manage scarce resources wisely.

Further underscoring the value of this data, CoStar Group, the nation's leading real estate information providers, announced recently that it would begin listing building energy efficiency and performance information on its website. CoStar will be partnering with the US Department of Energy to ensure that every time a building goes on the market, its energy statistics are made available to potential buyers, thereby empowering the consumer to make smart financial real estate decisions. This information, which plays an immensely important role in the decision-making process behind the sale of buildings in New York and around the country, is the exact type of data that Local Law 84 cultivates and makes available to the public, and that through Intro 1163 will become even more robust.

New York City's original benchmarking law sparked a movement of increased data collection and transparency nationally and internationally. Indeed, 14 cities, one county, and two states across the country have recognized the value of benchmarking ordinances and have passed legislation directly modeled after Local Law 84. More are in the works. While New York was

among the first cities in the nation to adopt benchmarking, other cities now stand to outpace us. Seattle, San Francisco, Austin, Washington DC, and Cambridge, have all adopted legislation that places their minimum square footage for benchmarking well below our 50,000 mark, with three more cities implementing 25,000 square foot benchmarking next year. The passage of Intro 1163 would give the City insight into a key blind spot: the roughly 10,460 mid-sized buildings between 25,000 and 50,000 square feet. Energy data on these buildings will allow us to glean information and tailor policy to the needs of those buildings, with better and more cost-effective results.

Intros 1160 and 1165

We are also here to testify today on Introductions 1160 and 1165's proposed changes to Local Law 88 of 2009. Local Law 88 requires the installation of electricity sub-meters for each non-residential tenant space measuring larger than 10,000 square feet in area. It also requires building owners to provide those tenants with monthly energy consumption statements. The affected building owners must report that they have implemented sub-metering systems by 2025. This law aims to address the problem of split incentives in non-residential properties. In many buildings, the tenant pays a flat monthly energy fee through their rent. If energy consumption is not separately metered, the tenant does not know or pay directly for the amount of energy consumed. As a result, owners cannot assess where energy is being used, tenants have little incentive to reduce energy consumption, and energy savers get stuck overpaying. Transparency for both tenants and landlords will help us develop effective energy efficiency strategies.

Intro 1160 would broaden the scope of tenant spaces that are required to have sub-meters, moving from a minimum square footage of ten thousand to five thousand. Here, too, this improvement will benefit more of the City's businesses, informing more tenants of their actual energy consumption, allowing for tenants and owners to make better decisions on energy efficiency, and paving the way for financial savings.

Another goal of Local Law 88 when adopted by the City was to reduce energy consumption from lighting, which accounts for almost 14% of energy use in New York City buildings, and roughly 11% of the citywide carbon emissions from buildings. The dramatic improvements in lighting technology that we've observed over the past two decades have allowed building owners to cost effectively reduce energy consumption by installing more

efficient lighting systems. Local Law 88 currently requires buildings over 50,000 square feet in floor area to upgrade lighting in non-residential spaces to meet New York City Energy Conservation Code standards and to report compliance by 2025.

The lighting improvements in Intro 1165 will help building owners achieve significant savings, and by expanding the scope of this requirement, this Council is once again increasing the number of New Yorkers who will realize these benefits. All told, lighting upgrades are associated with one of the fastest paybacks on investment that a building owner can experience. According to Local Law 87 existing data, the average payback period for lighting upgrades of is just under three years, with many upgrades paying back within one year. We anticipate this quick payback to extend to the 10,460 properties measuring between 25,000 and 50,000 square feet.

In both the case of sub-metering and of lighting, we recognize the up-front costs of making these improvements, but we are also keenly aware of the immediate return and long-term benefits that both building owners and tenants will observe as their facilities are upgraded. Lighting upgrades have some of the best returns on investment of any efficiency upgrade. These laws allow building owners and operators to save on costs in the long run, and to fully understand their energy consumption. To demonstrate our commitment, the City itself is investing \$1 billion to energy retrofits on approximately 3,000 municipal buildings. These projects all begin with benchmarking for properties starting at 10,000 square feet, audits and a focus on proven technologies like lighting.

On behalf of the Mayor's Office, I offer my strong support for the expansion of the scope of both Local Laws 84 and 88 through Introductions 1160, 1163, and 1165, and sincerely thank the Chair, the Committee, and esteemed members of the Council for introducing these important pieces of legislation. The Mayor's Office of Sustainability welcomes the opportunity to continue partnering with the City Council, the Departments of Citywide Administrative Services, Buildings, Environmental Protection, and Finance as we fulfill Mayor de Blasio's goals in OneNYC to make New York a greater, more sustainable, and more equitable city. Thank you for the opportunity to testify, and I can avail myself for any questions you may have.

RICK CHANDLER, P.E
COMMISSIONER
NEW YORK CITY DEPARTMENT OF BUILDINGS

HEARING BEFORE THE NEW YORK CITY COUNCIL
COMMITTEE ON HOUSING & BUILDINGS
JUNE 22, 2016

Good morning Chair Williams and members of the Housing and Buildings Committee and City Council. I am Rick Chandler, Commissioner of the New York City Department of Buildings (“Department”). I am joined by Gina Bocra, the Department’s Chief Sustainability Officer. We are pleased to be here this afternoon to offer testimony in support of Introductory Number 1169, sponsored at the request of the Administration, which makes important updates to the New York City Energy Conservation Code.

Given that nearly three-quarters of all emissions in New York City are generated by buildings, the design and operation of our buildings must be a central focus in our effort to address the negative impacts of climate change. This legislation before you represents the latest of numerous initiatives undertaken by this Administration to hold buildings to the highest standards for construction and energy performance, as outlined in the Mayor’s *One City: Built to Last* plan.

As this Council is aware, Local Law 85 of 2009 established the first New York City Energy Conservation Code (“City Energy Code”), which was last amended in 2014. The City Energy Code is part of our New York City Construction Codes and provides performance standards for building energy usage. The current City Energy Code is based on the New York State Energy Code (“State Energy Code”), and includes modifications to the commercial provisions that make

the City Energy Code more restrictive than the State Energy Code, as well as an administrative chapter that is tailored to our procedures at the Department.

On March 9, 2016, the New York State Fire Prevention and Building Code Council voted to update the State Energy Code, with technical changes to the residential and commercial provisions that align it with the 2015 edition of the International Energy Conservation Code (“IECC”). This update will be more stringent than the current 2014 State Energy Code, as well as our current City Energy Code. This change is being adopted in response to a federal mandate, and it has an effective date of October 3, 2016. The primary benefit of this code update by the State is that it has been determined by the United States Department of Energy to result in an average annual energy savings of 8.5% for new commercial buildings, and an average annual energy savings of 18.5% for new one- and two-family homes and small apartment buildings.

In accordance with the State Energy Law an energy code adopted by a local jurisdiction must be more stringent than the State Energy Code. Our changes at the local level proposed in Intro. 1169 will add to these energy savings. Changes proposed by New York City add another 5% average energy savings to small residential buildings, as determined by the Pacific Northwest National Laboratory. Energy savings also translates directly to financial savings, and increasing energy efficiency in buildings is a key strategy to mitigating climate change throughout the City. In sum, these changes will bring the best in energy efficiency to our building equipment and facades, and will ensure that the City’s buildings consume less energy as we work towards meeting our goal of reducing greenhouse gas emissions 80% by 2050.

Specifically, Intro. 1169 is being advanced to serve the following three goals:

1. To preserve the existing improvements in the current City Energy Code;
2. To adopt the State Energy Code as the basis of our technical provisions; and
3. To make several enhancements that will make our City Energy Code more stringent than the State Energy Code.

The local changes that are being proposed were developed by the Department of Buildings with the consultation of an Energy Code Advisory Committee. This Committee included representatives from the design and real estate industries, representatives from the construction industry and trades, representatives from affordable housing organizations, environmental interest groups, other City agencies and the City Council. The more substantive local amendments can be found in Chapters C4 and R4 of the proposals included in the bill. They are as follows:

- It introduces a requirement to account for the thermal energy losses of certain types of mechanical equipment that are installed through the wall that are understood to create a thermal performance deficiency. Additional insulation will be required to offset the losses when an owner chooses to install those types of equipment.
- It introduces a requirement for air-barrier testing in certain new large commercial buildings. Air-barriers are already required by the City Energy Code, but this testing protocol will support better detailing and installation, reducing energy losses while increasing long-term durability in the building envelope.

- It introduces technical changes relative to more stringent vestibule requirements in buildings over 75 feet in height, where pressure differentials can result in increased air leakage at the building lobby.
- It introduces minimum efficiency requirements for certain types of mechanical equipment not covered in the 2015 IECC that are regulated by the Federal government and are covered in American Society of Heating, Refrigerating and Air-Conditioning Engineers (“ASHRAE”) Standard 90.1-2013. This change sets the requirements to be equivalent with those of that standard.
- It retains a requirement for the control of HVAC in unoccupied hotel/motel guest rooms that was eliminated in the New York State Energy Code but will be reintroduced by ASHRAE 90.1-2016. This requirement reduces the amount of heating or cooling allowed in guest rooms when they are not leased.
- It introduces technical changes to the allowable lighting power density in office spaces and retail spaces, where the market is most favorable to the usage of the highest efficiency fixtures and lamps, without an undue cost burden to the owner.
- It introduces a threshold that triggers commissioning for renewable energy installations in commercial buildings, where no trigger previously existed. This trigger aligns with a policy established by Con Edison, and relieves owners of small installations from these requirements, where the benefit may not justify the cost.
- It mandates solar-ready requirements for new one- and two-family homes, as well as townhouses. These requirements merely preserve the space for future installation of solar panels on a roof that has sufficient solar-access, along with space for the installation of

electrical panels necessary to support the rooftop equipment. These provisions were modified to take New York City's density into account.

- And finally, it increases the effective savings of the City Energy Code for new homes by 5% by introducing more stringent thermal performance values for the envelope. These insulation and fenestration values are based on those used in upstate New York, and other cold-climate regions of the United States. Readily-available products satisfy the requirements, and homeowners will see long term savings result from a more robust envelope.

With the State Energy Code becoming effective on October 3, 2016 it is vitally important that the City Energy Code be effective by then or we will lose the improvements our Code provides and be subject to the State's Energy Code. Therefore, we respectfully request swift and careful consideration and approval of this legislation which will enable our Department and stakeholders to smoothly transition to the requirements of the new City Energy Code.

Thank you for your attention and the opportunity to testify before you today. My colleagues and I welcome any questions you may have.



MEMORANDUM IN OPPOSITION

Intro. 1163

The Rent Stabilization Association represents over 25,000 owners and managers of multiple dwellings in New York City. Collectively their buildings contain over 1 million units of housing. Intro. 1163 would expand the current benchmarking requirement that currently applies to buildings of 50,000 sf or greater to buildings of 25,000 sf or greater. These buildings are the single largest segment of affordable housing in New York and this bill would increase operating costs for many of those buildings. Because the data derived from the benchmarking law is of limited use to owners, RSA is opposed to Intro. 1163.

Most of the new buildings that would be required to benchmark energy use in their buildings are buildings that are owned and / or managed by small owners. Typically these buildings don't have the financial or technical resources that larger buildings possess. In many of these buildings the owners would have no choice but to retain a consultant every year to submit the benchmarking data. This could cost anywhere from \$500.00 to \$1,000.00. Most of our current members that do benchmark find little or no change from year to year and find the data of limited use. Owners know their expenses and are always looking for way to economize. Unfortunately when it comes to energy use big financial investments are necessary and finding the capital can be difficult. Benchmarking plays little or no role in this decision making process.

Benchmarking data seems to be most useful to city analysts and planners. Obviously they have access to DEP water use data by building. As an alternative to require owners to benchmark we suggest the city supply a simple authorization form to owners that would allow them to upload the electric and gas use for a building directly since this is the only practical way an owner would be able to gather the data. It makes no sense to require owners to make expenditures and possibly incur fines for non-compliance when the city could easily gather this data on their own for analysis.



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On the ground – and at the table.

New York City Environmental Justice Alliance testimony to the New York City Council Committee on Housing and Buildings in support of Intro. 1160, Intro. 1163, Intro. 1165, and Intro. 1169 to amend the energy code of the city of New York in relation to reducing greenhouse gas emissions through energy efficiency strategies that will reduce citywide emissions that disproportionately affect environmental justice communities.

June 22, 2016

Good morning Chairperson Williams and Members of the City Council. My name is Annel Hernandez and I am here to testify in support of Intro. 1160, Intro. 1163, Intro. 1165, and Intro. 1169 on behalf of the New York City Environmental Justice Alliance (NYC-EJA). Founded in 1991, NYC-EJA is a non-profit citywide membership network linking grassroots organizations from low-income neighborhoods and communities of color in their struggle for environmental justice. NYC-EJA empowers its member organizations to advocate for improved environmental conditions and against inequitable environmental burdens. Through our efforts, member organizations coalesce around specific common issues that threaten the ability of low-income and communities of color to thrive, and coordinate campaigns designed to affect City and State policies – including energy policies that directly affect these communities.

Because a number of the NYC-EJA member organizations come from communities overburdened by greenhouse emissions and co-pollutants from power plants clustered in their neighborhoods, our organization is a key advocate for the City's 80x50 emission reduction goals. NYC-EJA was a member of the Building Technical Working Group (TWG) that analyzed the potential GHG reductions pathways for the building sector. NYC-EJA also co-coordinates the Climate Works for All coalition with Align and the NYC Central Labor Council with the goal of reducing emissions and creating good jobs – with equity as a central focus. NYC-EJA commends the New York City Council Committee on Housing and Buildings for holding a hearing on these set of bills, creating an opportunity for public comment on this important milestone toward the implementation of the City's *OneNYC* and *One City: Built to Last* goals.

We support the Council's update to the Energy Code because it expands the number and types of building that are subject to energy regulations. By expanding the Greener Greater Building laws to include buildings over 25,000 square feet, from the previous regulation of 50,000 square feet, the City is taking a major step in reducing the largest source of emissions in the City. With more buildings utilizing benchmarking, the City will better track data on energy and water consumption (Intro. 1163). With more buildings complying with lighting upgrade requirements (Intro. 1165), sub-metering requirements (Intro. 1160), and other general updates to the energy code (Intro. 1169), the City is well on its way to substantial decrease in emissions.

As we take bolder steps to reduce our carbon footprint, the City should guarantee protections for low-income neighborhoods and communities of color. As the Energy Code continues to evolve, we need to create safeguards for rent-stabilized and rent-regulated buildings to ensure that families are not pushed out of their homes and communities due to Major Capital Improvement (MCI) rent increases. A just energy policy is central to NYC-EJA's work, and we look forward to a continued collaboration with the City to mitigate the threats of climate change.



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

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Testimony Before the Committee on Housing and Buildings

June 22, 2016

Commenting on Int. 1163 which Expands Benchmarking

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 Inc), a membership organization comprised of housing cooperatives and condominiums located throughout the five boroughs of New York City and beyond.

CNYC has worked with the Mayor's Office of Sustainability in support of its efforts to increase energy efficiency, while working also to keep costs down for our members as they are obliged to comply with new laws. Often the road to compliance can be rocky.

But the City worked hard to smooth the process when Local Law 84 of 2009 required benchmarking for buildings of 50,000 square feet or more by May of 2011. A telephone Help Line was established, where patient, knowledgeable guides helped board members, property managers and consultants navigate the benchmarking program. To facilitate compliance water use statistics are now sent directly to the program by the Department of Environmental Protection, and the City has also encouraged direct input from utilities as well.

The Department of Finance has adapted the data to provide meaningful results, helpful to the buildings in determining areas where conservation efforts would be most needed and, at the same time, establishing a city wide data base of energy information that has no equal.

With most of the kinks worked out of benchmarking, Int. 1163 will expand the requirement to include buildings of 25,000 square feet and more. The Help Line will be there to help novices navigate the system. Through the Retrofit Accelerator, the City will provide more free guidance. And there is sufficient time for these buildings to learn what is required: their first benchmarking is due on May 1, 2018 tracking energy and water use in the year 2017.

Benchmarking requires us to measure energy use and shows where our energy dollars are going. Medium sized buildings can benefit from this tool to pinpoint problems and work to solve them. Unlike larger, more complex structures, these building surely don't need costly energy audits, and we have assurances from the Mayor's Office of Sustainability that these will NOT be required. Instead, using the information that the benchmarking experience reveals, these buildings will be encouraged to fine-tune equipment and systems (retro commissioning) and to raise resident awareness of areas where energy use can be improved.

But even with time to plan, and with good guidance available, unfunded mandates wreak havoc with building budgets. We would urge the inclusion of tax credits or other means to help buildings recover the cost of this new mandate (and those to follow).

Thank you for this opportunity to comment.



NEW YORK CITY CENTRAL LABOR COUNCIL AFL-CIO

President
VINCENT ALVAREZ

Secretary-Treasurer
JANELLA T. HINDS



City Council Hearing on Energy Efficiency Committee on Housing and Buildings

June 22, 2016

Good morning, my name is Alex Gleason, and I am the Policy Associate at the New York City Central Labor Council, AFL-CIO. Representing 1.3 million workers across 300 affiliated unions, the Central Labor Council and its affiliates are well aware of the adverse impact of climate change, and the threat posed to all working New Yorkers. Along with ALIGN, the NYC Environmental Justice Alliance, and others, the Central Labor Council has been pushing an agenda to tackle the dual crises of resiliency and income inequality. Our coalition, Climate Works For All, strongly supports a mandatory reduction of emissions on large buildings, and believes this is essential to tackle climate change in an effective way.

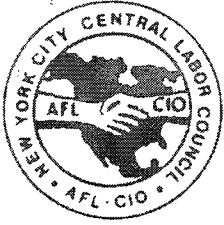
Under the Bloomberg Administration and PlaNYC, the City focused first and foremost on buildings over 50,000 square feet; this was reasonable enough, as those are the most technically complicated, and possess the most financial resources. After almost seven years, it is time to expand these programs, and require the same standards on a larger set of buildings. Climate Works For All and the Central Labor Council support the New York City Council's efforts to expand the Greener Greater Buildings law to those over 25,000 square feet. We must become more aggressive to mitigate the climate crisis, and this is one of the things the City can do¹.

The Central Labor Council also supports the Energy Code revisions increasing the efficiency of buildings. Code revisions are an important element in driving New York City into an era of passive house standards. There are a myriad of code changes proposed by the 80x50 working group not in this bill, but will be brought before a code committee later this year. We encourage the members of the Committee on Housing and Buildings to push the timeline on this process, so the Council is in a position to have a series of passive house-like code ready to vote on before the end of 2016. Most of the code changes apply when buildings plan to do work, and the updated codes are triggered. The sooner the city implements passive house standards, the sooner we can begin to reduce emissions.

It should also be noted the climate crisis is not happening free from other policy issues or challenges; it is a dynamic, multidimensional issue, and can push problems like income and wealth inequality to the brink. In other words, it is the poor who will feel the greatest impact of climate change², while contributing the least to it. The City has an opportunity to both advance plans to reduce emissions, and create well-paying jobs for climate vulnerable New Yorkers.

¹ "New York City contains about one million buildings comprising 5.75 billion square feet of building stock. Its buildings are responsible for 71% of the city's greenhouse gas emissions (GHG) and 94% of its electricity consumption." Mazria, Edward. "Achieving 80x50 – Transforming New York City's Building Stock." <http://architecture2030.org/achieving-80x50-transforming-new-york-citys-building-stock/>.

² Damage to climate vulnerable neighborhoods, working outside in dramatic hot/cold temperatures, higher utility bills, least access to financing home renewables, etc.



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Secretary-Treasurer
JANELLA T. HINDS



The City currently has no comprehensive jobs plan around the climate. There are a few programs and initiatives that exist in isolation: The NYC Economic Development Corporation (EDC) and the Mayor's Office of Workforce Development has the Hire NYC initiative and the First Look system; the Mayor's Office of Housing Recovery Operations (HRO) has the Sandy Build it Back program; NYCHA has Section 3 local hiring and Jobs. Even with these successful programs in a variety of areas, there is no concrete plan around retrofitting and job creation. The Retrofit Accelerator does not appear to be linked to a workforce development program. Not to mention, the City's installation of solar on public buildings via power purchasing agreements has contracted low-road vendors who do not create career-track job opportunities for New Yorkers. There is amazing potential here to create a large-scale workforce development program, and the New York City Labor Movement—and Climate Works For All—is able and willing to help with that.

New York City has the opportunity to effectively tackle both climate change and income inequality. A proactive approach to fighting climate change that incorporates job growth would benefit residents and taxpayers for generations. We should use any and every opportunity to lift the floor on wages, benefits, and the standard of living for all New Yorkers. Thank you for your time and consideration.



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Testimony of Victor Nazario, Member - 32BJ SEIU

Committee on Housing and Buildings

Council Bills 1160, 1163, 1165 and 1169 of 2016

June 22 2016

Good morning Committee Chair Williams and Committee Members. My name is Victor Nazario and I'm a Resident Manager on the Upper East Side. I've been a member of 32BJ since 1978 and was part the Union's Training Fund's first class of Green Supers in 2010.

I am here today to testify in support of bills 1160, 1163, 1165 and 1169.

32BJ represents over 155,000 members, including almost 70,000 here in the New York Metropolitan Area. 32BJ members are cleaners, janitors, security officers and other building service workers. We also proudly reflect the full diversity of New York City.

Far too often it is low-income communities and communities-of-color that are disproportionately affected by climate change. For this reason, 32BJ supports the City's goal of reducing greenhouse gas emissions by 80% by 2050.

The building industry has a crucial role to play in meeting this goal – nearly 75% of the City's emissions come from buildings and their operation.¹

Since 2010, 32BJ's Training Fund has trained over 2000 union members in sustainable building operations and maintenance. The course has given workers like me the knowledge and skills to improve the efficiency of our buildings. Projects I have undertaken on the job include lighting system replacements, building envelop upgrades, and boiler and pipe insulation.

Bills 1160 and 1163 will complement the efforts of building service workers by ensuring they have the information they need to identify potential efficiency improvements and to work with building owners and directors to determine priorities for capital expenditure.

Bills 1165 and 1169 continue the City's efforts to integrate the most recent standards of energy efficiency into our buildings stock. These upgrades can lead to thousands of dollars in energy savings for owners and tenants, and by mandating them in a greater number of buildings we will get us closer to reaching our emissions reduction target.

On behalf of the City's building service workers I encourage the council to pass these bills. I also remind the Council of the ongoing importance of training and standards in the building service industry that ensure measures like these are supported on the job by a skilled and experienced work force.

¹ www1.nyc.gov/office-of-the-mayor/news/386-16/onenyc-mayor-de-blasio-major-new-steps-dramatically-reduce-nyc-buildings-greenhouse



**The New York City Council
Committee on Housing and Buildings
Wednesday, June 22, 2016**

Hearing on Int. No. 1169-2016 – A Local Law to amend the administrative code of the city of New York, in relation to conforming the New York City energy conservation code to the New York state energy code with amendments unique to construction in the city and repealing section 28-1001.2

Testimony by Daniel H. Nall PE, Vice Chair, Energy Codes Committee, American Council of Engineering Companies of New York (ACEC New York)

On behalf of the American Council of Engineering Companies of New York / Metropolitan Region (“ACEC New York”), I’d like to thank the Mayor’s Office, City Council and the NYC Department of Buildings for inviting us to share our perspective on the city’s efforts to update the New York City energy code. I am a Vice President of the Syska Hennessy Group located in New York City and as Vice Chair of the ACEC New York Energy Codes Committee, I am here today to testify in favor of the proposed update to the New York City Energy Conservation Code.

Founded in New York City in 1921, ACEC New York is one of the oldest continuing organizations of professional consulting engineers in the U.S. ACEC New York represents 280 engineering and affiliate firms throughout New York State that collectively employ more than 20,000 people statewide, with a concentrated presence of firms located within the five boroughs of New York City. ACEC New York is dedicated to promoting growth of the industry through the education of our members, promotion of cooperative relationships, and by addressing specific areas of concern on behalf of our membership. Our members volunteer hundreds of hours every year helping NYCDOB with Construction Code updates.

The legislative schedule for adoption of Intro 1169 is of critical importance to all New York City stakeholders. By State process, the new New York State Energy Code will go into effect on October 3 of this year. As such, and by law, the New York City code update must also go into effect on or before this date. Since the design process for new buildings takes many months, and sometimes years, project Owners and design professionals for projects that will need file for building permits in the October time frame are already at risk due to the uncertainty of the pending code update, relative to design decisions that needed to be made some time ago. Thus, I wish to emphasize the acute need to pass this Intro prior to the end of June, in order to allow the industry time to react to the required design changes prior to effective October 3rd date.

Next, I would like to call attention to continuing the precedent set in the last Energy Code update, in modifying section C407 (Total Building Performance) of the Code by replacing the requirements of the International Energy Conservation Code with the analogous requirements of ASHRAE Standard 90.1-2013. This step greatly simplifies the complexity of the Energy Code by removing a redundant energy modeling-based compliance path that is not well articulated nor



**Statement of
Samantha Wilt
Energy Policy Analyst
Natural Resources Defense Council**

**Before the
New York City Council**

June 22, 2016

Good morning, my name is Samantha Wilt, and I am an Energy Policy Analyst at the Natural Resources Defense Council. Thank you for the opportunity to testify on the important package of legislation before you today. NRDC strongly supports the passage of Int. Nos. 1160, 1163, 1165 and 1169, and suggests a few proposed amendments, below.

NRDC has a long history of working in New York City on issues related to building energy efficiency, including working extensively with the Council and the Administration on the landmark Greener, Greater Buildings Plan, which we have since taken to other cities across the country through our City Energy Project. The legislation before you today expands many elements of that Plan to smaller buildings, and thus will not only play a critical role in achieving the City's 80 x '50 greenhouse gas reduction goal, but will result in significant job creation, lower energy costs for consumers, fewer emissions of harmful pollutants, and increased reliability of our electric grid.

As you know, buildings in New York City account for nearly three quarters of total citywide carbon emissions. Therefore, to reach our 80 x '50 and interim greenhouse gas reduction goals, we will have to continue the great strides that have been made since the passage of the Greener, Greater Buildings Plan, including in just the first four years (through 2013) energy savings of 5.7%, yielding more than \$267 million in energy cost savings, and GHG reductions of 9.9%.¹ We will need to push forward and capture the annual estimated reduction of 710,000 metric tons of CO₂ equivalent from passing this current package of

¹ U.S. Department of Energy. "New York City Benchmarking and Transparency Policy Impact Evaluation Report." May 2015. Table 5-1, p. 23. At: <http://energy.gov/sites/prod/files/2015/05/f22/DOE%20New%20York%20City%20Benchmarking%20and%20Transparency%20Policy%20Impact%20Evaluation....pdf>

legislation,² and of course continue to pursue additional measures and efforts to yield highly efficient, more comfortable and affordable buildings for everyone in the city.

We offer a few specific comments on the legislation under consideration:

Int. No. 1160: Submetering allows individual tenants to monitor their own energy consumption, and thus equips them to make better-informed decisions about optimizing their energy management. We support this legislation and suggest that the Council consider lowering the “covered tenant space” threshold for retail tenants, which can be very energy intensive (perhaps to 1,000 square feet).

Int. No. 1163: Benchmarking is a foundational policy that allows building owners to target areas of energy and water waste, and to compare their buildings with similar ones, track their savings over time, and create operations and maintenance and capital plans that integrate energy savings investments. Owners can receive assistance from the benchmarking helpline to input their data and then work with the city’s Retrofit Accelerator and other programs to implement savings measures. We support this legislation and suggest that the Council also investigate to ensure there are no barriers in place that may prevent the usage of this data for public disclosure efforts such as building labeling.

Int. No. 1165: Lighting upgrades to meet the current energy code yield significant energy and cost savings, with fast paybacks. We support this legislation and suggest that the building owners it applies to be allowed ten years to comply.

Int. No. 1169: Strengthening the New York City energy conservation code and conforming it to the New York state energy code; code improvements are fundamental to lock in more efficient, comfortable and resilient buildings for the future. We support this legislation and suggest that the Council pass it as soon as possible so that the construction industry can become familiar with and prepare to comply with the new requirements as soon as they come into effect.

We applaud the City Council and the Administration for your continued national and international leadership on this topic and look forward to continuing to work with you to achieve the City’s critical climate goals.

Thank you.

² *One City Built to Last*, The City of New York, 2014, p. 70, Lighting and Submetering expected outcomes, p. 88 Energy Code expected outcomes.



Update to Greener, Greater Building Codes Int. 1160, 11633, 1165, & 1169

Environmental Defense Fund
June 22, 2016

Honorable Councilmembers,

Thank you for introducing these bills. In particular, thank you to Councilmembers Constantinedes, Garodnick, Richards, and Williams for sponsoring these bills. Environmental Defense Fund (EDF) is grateful for the opportunity to speak on these vital issues.

Today we are here to discuss several amendments to the 2016 Energy Code: Int. 1163, an amendment to the Local Law 84 benchmarking law to apply to buildings larger than 25,000 square feet in size as opposed to 50,000 square feet and above; Int. 1165, an amendment to Local Law 88 to mandate lighting upgrades to buildings larger than 25,000 square feet; and Int. 1160, mandating sub-meters in commercial tenant spaces larger than 5,000 square feet in size. EDF supports the bills introduced in this hearing.

By updating the Greener, Greater Buildings laws, New York City is taking significant steps to achieve energy and carbon reductions. Mayor de Blasio and this council have set ambitious goals for our city, reducing 80 percent of our carbon emissions by 2050, and as roughly 75 percent of New York City's emissions come for buildings, these introduced bills will go a long way toward making that possibility a reality. Critical to this effort is developing an accurate accounting of how much energy is used and for what purpose. Benchmarking building energy use has proven to be an essential tool, enabling a greater level of understanding and awareness of a buildings performance. The more buildings that benchmark, the clearer our understanding becomes. EDF is supportive of swift and strong action to reduce our emissions citywide and these bills, collectively, help enable that outcome.

However, there are some concerns. EDF requests that the Council work to ensure that the agencies responsible for tracking and verifying compliance are appropriately staffed and equipped to handle the resulting increase in workload.

Additionally, the expanded pool of buildings and tenant spaces subject to compliance may require additional time and support to comply with these requirements. It would be to the benefit of all parties that the City provide additional support for smaller buildings, buildings facing financial hardship and low-income housing to aid in compliance.

Addressing energy use in buildings is crucial in addressing the cause of climate change – carbon emissions. By reducing energy use in buildings, we cut costs on energy bills as well as reducing emissions, making our city a cleaner, safer place for future generations. The Council has done well in expanding the pool of buildings required to act, and Environmental Defense Fund looks forward to working with the Council and Mayor de Blasio to pass these bills and implement them successfully.

Abbey Brown
New York City, Clean Energy Project Manager
Environmental Defense Fund
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CATHOLIC COMMUNITY RELATIONS COUNCIL

Testimony of Joseph Rosenberg
Executive Director, Catholic Community Relations Council
Before the New York City Council Committee on Housing and Buildings on Intro. 1163
June 22, 2016

Good morning Chair Williams, Councilmember Garodnick and members of the City Council Housing and Building Committee. I am Joseph Rosenberg, Executive Director of the Catholic Community Relations Council (“CCRC”) representing the Archdiocese of New York and Diocese of Brooklyn on local legislative and policy issues. I appreciate the opportunity to testify before you on Intro. 1163.

Local Law 84 of 2009 requires that owners of buildings that are 50,000 square feet or greater must benchmark their energy uses annually. The bill before you today greatly expands the focus of this mandate. It requires that owners of buildings that are 25,000 square feet or greater must benchmark their annual energy usage.

The aim of reducing gas emissions is a laudable one, not just in our City but worldwide. This is a topic, ultimately, of global significance. We question, however, the need for expanding the energy benchmarking law and specifically this legislation. It is clear that the benchmarking program is designed to accumulate planning data for the City, but the annual reports created are of little help to property owners. It also places an administrative and fiscal burden on property owners, especially non-profits who are faced with hiring mechanical engineers or other consultants to comply with the annual energy benchmarking mandates. The existing law and this proposed bill, do not translate into energy use reduction. All property owners, both private and non-profit, are aware of their operating expenses. They work to identify and reduce such costs. How could it be otherwise in this environment of rising expenses and hard to manage budgets?

Catholic Church properties throughout New York City include cathedrals, chapels, schools, rectories, convents, community centers and affordable housing developments. The ceiling heights, stained glass, landmarking pressures and age of the Church’s portfolio make this proposed law a great burden. Many of these properties house mission driven social service operations that focus on providing essential assistance to elderly, disabled and needy residents of our City. Given the scope of Intro. 1163, I urge the Council to focus on understanding this bill’s impact on various sectors of our City.

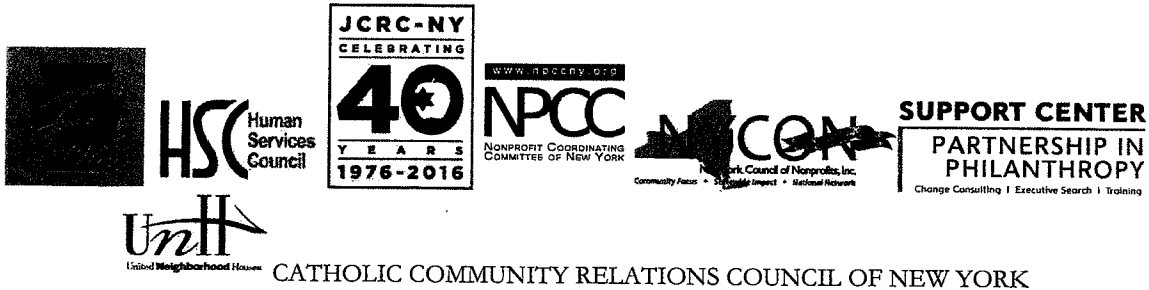
Local Law 84, with a building compliance threshold of 50,000 square feet or more, requires the energy benchmarking of 62 properties owned by the Catholic Church throughout the five boroughs. Intro. 1163, with a proposed building compliance threshold of 25,000 square feet or more would add 290 church properties to this mandate. The number of church owned buildings covered under this proposed benchmarking requirement would therefore soar from 62 properties to over 350 properties.

The costs and administrative burdens of complying with annual benchmarking are of concern. Arguably one of the goals of this initiative might be to save energy costs. But any such savings are over the long term and you need to have money up front to save money.

Our parishes do not have the available finances to fund energy conservation measures. Without some financial mechanism or funding stream, compliance with this broad and expanded mandate will be a difficult challenge. This troubles us, and we urge that the Council and the Mayoral Administration either exclude non-profits from the mandates of this bill or identify a means to help non-profit entities comply with this legislation.

Even more significantly, we also see this legislation as a preview of others to follow that would force owners of very limited resources to upgrade the energy, heating and lighting systems of their buildings when there is no funding available for them to do so. In the case of the Archdiocese of New York and the Diocese of Brooklyn, such a mandate may have a chilling financial effect on the ability of parishes to continue to provide the essential social services that assist so many of our needy New Yorkers.

Thank you.



June 20, 2016

Honorable Dan Garodnick
 New York City Council Member
 211 East 43rd Street, Suite 1205
 New York, New York 10017
 Via email: garodnick@council.nyc.gov and Genevieve Michel, Chief of Staff,
gmichel@council.nyc.gov

Re: Intro 1163-2016
 Committee on Housing and Buildings

Dear Council Member Garodnick,

The undersigned organizations write to raise concerns about Intro 1163-2016, a bill that would expand the list of buildings required to be benchmarked for energy and water efficiency. Specifically, this bill would modify a 2009 law by decreasing the square footage requirement from 50,000 square feet to 25,000 square feet¹, which means that more nonprofits that own or rent property in New York City, many of which are small and less familiar with compliance than commercial entities, will be required to comply with extensive and burdensome reporting requirements. We believe this bill may have unintended impacts on nonprofits in New York City, and we urge the City Council and Mayor de Blasio to provide additional support to nonprofits to help them comply.

We strongly support the City's goals of energy sustainability and applaud the City Council and Mayor for taking steps toward this goal. However, we believe that the reporting requirements included in the bill would be overly burdensome. Specifically, the obligation to report energy use for *all utility accounts and addresses connected to a building*, along with the recordkeeping and audit requirements, will require significant staff training, time, and coordination. We believe that:

- the bill would create an unfunded mandate
- the proposed benchmarking is not the most efficient means of data collection², and
- the bill reduces time the to comply and does not provide the necessary assistance to nonprofits

All of these unintended consequences will create a drain on nonprofits' resources and time.

¹ The City's calculation of square footage is often inaccurate, especially when dealing with nonprofits using multi-story spaces. While the assessor rolls show the square footage of a building's footprint and the number of floors, for nonprofits using multi-story spaces, calculations using these data will not be accurate because sanctuaries are often multi-story spaces. There should be a simple online process to appeal the City's determination of square footage.

² It would be more efficient, for example, for energy and water companies to be required to pre-populate this information in City databases.

This Intro will have an adverse impact on nonprofits that own buildings. Nonprofit owners are different from other property owners – because their buildings exist primarily to support their nonprofit missions. In addition, nonprofits are not entitled to tax credits. While energy savings can be used to support nonprofit programmatic needs, nonprofit owners cannot deduct the costs of an upgrade from their taxes or receive tax credits to help finance retrofits. This results in an unfunded mandate that will put an additional cost onus on already overburdened nonprofits.

In its 2009 incarnation, the Administration was confident that energy and water providers would supply relevant data to building owners, thus facilitating the benchmarking process. When some of us met with the sustainability outreach team in March we learned that, to date, no progress was made on that front. In our opinion, any legislation should require energy and water providers to supply data in a such format that any building owner could readily insert them into the benchmarking applications. In order to ease the burden on all property owners, § 28-309.5.1 should read:

Direct upload by a utility company or other source. The office of long-term planning and sustainability shall [encourage and facilitate] require any utility company or any other source authorized by the office of long-term planning and sustainability to upload directly to the benchmarking tool, as soon as practicable, information necessary to benchmark a building. [Where information is uploaded directly to the benchmarking tool by a utility company or other authorized source, owners and tenants shall not be obligated to request and report such information pursuant to section 28-309.4.1.]

The current language shifts the burden of data collection to building owners and makes it difficult for nonprofit owners to comply without hiring outside consultants. Our proposal would require the Administration to negotiate with the utility providers rather than placing the onus on property owners.

Additionally, nonprofits are given less time to comply in this Intro. The proposed bill reduces the time in which property owners can comply from five years (in 2009) to two years with annual updates required thereafter. This reduction in time will also create a burden on nonprofits, particularly those that are smaller and do not have the compliance mechanisms already in place.

As well, nonprofits need assistance in learning how to benchmark for energy and water efficiency. Although this bill indicates that the Department of Buildings will be available to assist, we do not believe this language is clear or specific enough to inform nonprofits about the resources that are available to them. When the earlier bill passed in 2009, both the previous Administration and the previous Council leadership pledged to take steps to facilitate the participation of nonprofits, *e.g.*, specific initiatives with public, NYSERDA and foundation funding, to assist nonprofits with sustainability. Unfortunately, this assistance has not yet been implemented. We believe the City should recognize nonprofit owners as a special class and provide special outreach and assistance. To be effective, training should be locally targeted and users should be able to readily avail themselves of "virtual handholding." The "clock" for compliance should not begin ticking until such a system has been put in place.

While we appreciate and support the City's efforts toward sustainable energy, given the above analysis, it appears that this Intro could create another unfunded mandate that will divert both programmatic funds and staff time of nonprofits. Nonprofits should not be required to comply until the City is prepared to offer real help, including technical assistance and funding for recommended upgrades.

We are asking that Intro 1163-2016 be amended in the following manner:

1. Create a special class for nonprofit owners, including special outreach and assistance.
2. For City-contracted nonprofits, contract dollars should be increased to cover the cost of upgrades.
3. For nonprofits that do not contract with the City, low-cost financing options should be available for recommended upgrades.
4. Work with energy providers to “pre-populate” benchmarking information to reduce the need for nonprofits to hire outside consultants.
5. Extend the date of required compliance to five years and start the compliance “clock” only after the assistance mentioned above is implemented.
6. Clarify and specify the type of assistance that will be offered, the time frame in which it will be offered, and how nonprofits can report any lack of assistance to the City to avoid being held in noncompliance in situations in which they did not receive assistance.

We welcome the opportunity to speak with you about these matters. While some of the undersigned organizations will be testifying at the bill’s hearing, all can be reached through Sharon Stapel, President, Nonprofit Coordinating Committee of New York, at 347.451.9936 or [sstapel@npccny.org](mailto:ssstapel@npccny.org).

Very truly yours,

Jennifer Jones Austin, FPWA

David Pollack, Jewish Community Relations Council of New York

Joe Rosenberg, Catholic Community Relations Council of New York

Doug Sauer, New York Council of Nonprofits, Inc.

Allison Sesso, Human Services Council

Susan Stamler, Executive Director United Neighborhood Houses

Sharon Stapel, Nonprofit Coordinating Committee of New York

Keith Timko, Support Center | Partnership in Philanthropy

cc:

The Honorable Donovan J. Richards, Council Member (via email to Franck Joseph, Chief of Staff, fjoseph@council.nyc.gov)

The Honorable Corey D. Johnson, Council Member (via email to Louis Cholden-Brown, Director of Legislative and Budget Affairs, LCholden-Brown@council.nyc.gov)

The Honorable Costa G. Constantinides, Council Member (via email to Nicholas Widzowski, Director of Legislative and Budget Affairs, nwidzowski@council.nyc.gov)

The Honorable Margaret S. Chin, Council Member (via email to Yume Kitasei, Chief of Staff, ykitasei@council.nyc.gov)

Ramon Martinez, New York City Council Chief of Staff, via email to rmartinez@council.nyc.gov

Laura Popa, New York City Council Deputy Chief of Staff, via email to lpopa@council.nyc.gov

The Honorable Bill de Blasio, Mayor (via email to Maya Wiley, Counsel to the Mayor, mwiley@cityhall.nyc.gov)



AIA
New York

**The American Institute of Architects New York
Testimony before the New York City Council Committee on Housing and Buildings
June 22, 2016**

The American Institute of Architects New York (AIANY) represents over 5,200 registered architects and associated design and construction professionals. AIANY aims to lead, inspire, and educate our members on design and sustainability. We organize engaging programs that focus on outstanding green buildings, current technologies and product research, and sustainable design practices by leading architects. Our efforts are based on the belief that sustainability should be an essential part of the design process and be fully integrated with all aspects of a building, including form, function, site, structure, systems, and construction.

AIANY is partaking in a sustained push for initiatives that reduce carbon emissions in the built environment and create healthy spaces for New Yorkers to live and work. In order to achieve the Mayor's 80x50 goals, both public and private sectors must undergo large-scale changes. AIANY has worked collaboratively with Urban Green Council on these issues, and we support their previous statements on the Energy Code updates. We must move quickly to ensure that the industry can properly learn the code and comply with it. AIANY and Urban Green Council are prepared to ramp up education related to the new codes, but we need the maximum amount of time possible before the code goes into effect on October 3rd. We will briefly outline our thoughts on the remaining bills.

The American Institute of Architects

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Intro 1160

In order for our buildings to be more efficient, we support Intro 1160, which would require the installation of sub-meters in certain tenant spaces. We, however, propose that smaller retail tenants also be included in the bill. Retail spaces can be incredibly energy intensive. By sub-metering retail, as well as residential, spaces this bill can make a significant impact on NYC's energy use.

Intro 1163

We support the effort to expand the group of buildings that are required to benchmark energy and water efficiency, as outlined in Intro 1163, but we suggest that the bill explicitly state that the space's gross square footage be accurate as well.

Benchmarking is essential to energy efficiency because we cannot manage what we do not measure. It also helps building owners identify where money can be saved. Programs, such as the City's Retrofit Accelerator, are in place to assist building owners in upgrading their buildings.

Buildings that are currently benchmarking have demonstrated efficiency improvements. NYC buildings that have benchmarked for four years have reduced energy consumption by an average of 6%, which is comparable to what is being seen in other cities. After the first year of benchmarking, it becomes a relatively straight-forward process. Buildings' basic information will be in the system, so building owners only have to add their energy use information for each successive year. The City-run Benchmarking Help Center can also assist building owners and managers.

Intro 1165

Lighting systems are essential to a building's efficiency. We support Intro 1165 to upgrade certain lighting systems, but we also suggest that the bill allow smaller buildings and spaces ten years to comply with the law, in order to enable upgrades to occur at the



AIA
New York

time of a lease turn over, as it had for larger buildings and spaces. These updates are most successful when the lease turns over.

We are excited that NYC is taking the lead on these efforts and thinking holistically about our next steps. Passing these bills, in addition to the latest Energy Code, as discussed by Urban Green, are increasingly important. We look forward to working with you on this.

The American Institute of Architects

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**City Council Hearing on Energy Efficiency
Committee on Housing and Buildings
June 22, 2016**

Thank you to Chair Williams and other members of the Committee on Housing and Buildings for their important work to address climate change through New York City's buildings.

My name is Josh Kellermann and I work at ALIGN: The Alliance for a Greater New York. ALIGN is a community-labor coalition dedicated to creating good jobs, vibrant communities, and an accountable democracy for all New Yorkers. ALIGN co-coordinates the Climate Works for All coalition with the NYC Central Labor Council and the NYC Environmental Justice Alliance. Climate Works for All seeks to address the dual crises of climate change and inequality by reducing emissions and creating good jobs for New Yorkers.

I sat on the Mayor's 80x50 Technical Working Group and as a result have been tuned in to the conversation about how we move from rhetoric to reality on energy efficiency retrofits of the City's more than 1,000,000 buildings.

Under former Mayor Bloomberg, the City first focused on our largest and most polluting buildings – those over 50,000 square feet in size – for data gathering and low-cost energy efficiency retrofits. It made sense to prioritize these buildings because they are the most technically and financially capable of conducting this work. Now, nearly seven years later, it is high time to expand these programs to a larger set of buildings. We support the Council's effort to expand the Greener Greater Buildings law to buildings over 25,000 square feet. This is another step in the right direction towards addressing the climate crisis.

We also support the Energy Code revisions that increase the efficiency of our buildings. These code changes are a first step in what hopefully will be a series of energy code upgrades ushering our city into an era of passive house standards. I want to emphasize that while some of the energy code changes before this Committee reflect recommendations from the 80x50 Technical Working Group, there are a host of other recommended changes that are not in this bill. These recommendations will be brought to an ad hoc code committee later this year and we encourage the members of the Committee on Housing and Buildings to push the timeline on this process so that we have a set of passive house-like code ready for a vote by the end of 2016. Most code changes only apply when a building is planning to do work that triggers the updated code. This work is happening all the time. Thus, the sooner something is on the books, the greater the impact on our emissions.

I want to make clear, however, that the climate crisis does not exist in a vacuum. It is amplified and sharpened by the deep levels of inequality that divide our city. Those in poverty experience more acutely the impacts of climate change and at the same time are least responsible for creating the climate crisis. It is essential that as the City advances plans to reduce emissions, it uses the opportunity to create good jobs for climate vulnerable New Yorkers. This focus will ensure that we create a truly resilient New York City.

The City currently has no comprehensive jobs plan. There are a few programs and initiatives that exist in relative isolation: The NYC Economic Development Corporation (EDC) and the Mayor's Office of Workforce Development has the Hire NYC initiative and the First Look system; the Mayor's Office of Housing Recovery Operations (HRO) has the Sandy Build it Back program; NYCHA has Section 3 local hiring and the Resident Employment System (RES); among others. Yet the City's bold retrofit plan seems to have no attendant jobs plan. The Retrofit Accelerator does not appear to be linked to a workforce development program. The City's installation of solar on public buildings has, in the past, contracted with low-road contractors who do not create career track job

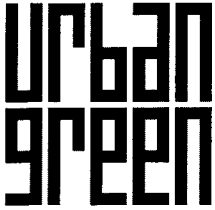
opportunities for New Yorkers. These are massive missed opportunities not just to reduce inequality through our climate investments, but also to create true resiliency in New York City.

I want to note that this is not just about training workers. This is about outreach and recruitment systems that are integrated into low-income communities, this is about wrap-around services to support people moving into the formal economy, this is about ensuring, in fact requiring, that the jobs created are good, safe jobs with benefits. The manufacturing industry that created the middle class in the U.S. were some of the worst, most dangerous and low paying jobs around until workers, communities, and the government made them good jobs.

Lastly, there needs to be a clear game plan for how the City will ensure that the required retrofit work does not undermine affordability. Will there be additional funding available to rent controlled buildings through which the City can prevent this work from resulting in a Major Capital Improvement (MCI) rent increase? What other tools can the City leverage to ensure we are green, and affordable? This issue will become more and more pointed as the mandates increase.

New York City should be known not just for its leadership on climate, but also for its leadership on inequality. We look forward to working with the City Council and Committee on Housing and Buildings to simultaneously address the climate and jobs crises.

Thank you.



**Testimony of Laurie Kerr, FAIA
Director of Policy, Urban Green Council
Before the New York City Council Committee on Housing and Buildings**

June 22, 2016

Good morning Chairperson Williams and members of the Committee. My name is Laurie Kerr. I am a licensed architect and the Director of Policy for the Urban Green Council, which seeks to transform New York City's building industry to achieve a sustainable future. On behalf of Urban Green, I am testifying in favor of Intro's 1160, 1163, 1165, and 1169.

Because of the breadth of today's legislation, we have coordinated our testimony with that of AIANY, with AIANY testifying on the expansion of the Greener, Greater Buildings Plan to buildings between 25,000 and 50,000 square feet and Urban Green concentrating on Intro 1169, the update to the New York City Energy Conservation Code. We fully support AIANY's testimony.

Urban Green supports Intro 1169 in its entirety and strongly encourages City Council to move swiftly to adopt this new energy code, which will need to go into effect by Oct. 3 of this year. Urban Green and AIANY are poised to provide code training to the design community, but time is already very short. Delays in code adoption would exacerbate the problem, potentially resulting in extra costs for the real estate industry should projects need to be amended and re-submitted to meet the new code provisions.

Urban Green supports Intro 1169 for several reasons:

- Achieving the City's target of 80% carbon reductions by 2050 will require new buildings to become dramatically more efficient. Intro 1169 represents a significant step in that direction.
- The core provisions of Intro 1169 are the updates to the energy codes that were adopted by New York State in March. By state law, New York City's energy code is required to be at least as stringent as the state's.
- The NYC-specific provisions that have been added to the underlying state code were developed by a local industry advisory group convened by the Department of Buildings and rigorously vetted by the Department to ensure that only the best and most cost-effective proposals were included.

I would also like to offer testimony in favor of two specific provisions.

1. The first provision would require new houses and new apartment buildings three stories or less in height to comply with the insulation requirements for Zone 6, which includes much of upstate New York. Attached to my testimony

is a cost-benefit analysis performed by Architect/ Builder Jeremy Shannon of three different strategies for complying in a detached framed house and in a townhouse. Using the most cost effective strategy, the detached home would save \$540 per year and pay for itself in 5.6 years; the townhouse would save \$177 per year with a 6.5 year payback. Since a building's thermal envelope is rarely, if ever changed, this means that the initial costs would pay for themselves many times over during the estimated 100 year lifespan of the house.

2. The second provision would close a loophole in the envelope requirements for larger buildings. Currently the code does not account for the heat lost through the metal air conditioners and PTAC units (local heating and cooling units) that puncture the walls of many apartment buildings. This provision would require designers to include the impacts of these units in their energy analysis, and if need be, compensate for the losses by providing more insulation or better windows. Attached to my testimony is a cost-benefit analysis of a 300 unit apartment performed by Steven Winter Associates. It shows that additional insulation would add roughly \$35 to the construction cost of each apartment and this measure would pay for itself within 3 to 4 years.

Thank you for the opportunity to testify today.

Residential IECC

Proposal to change the prescriptive insulation and fenestration requirements from Zone 4 to Zone 6 (except for SHGC requirements)

1. Proposal Summary:

The proposal would require residential construction to be built to the requirements of Zone 6 rather than Zone 4, with the exception of the solar heat gain coefficient requirement, which would remain as Zone 4. Because NYC buildings typically have basements rather than slab on grade or crawl spaces, this change would primarily impact wall insulation, with a slight improvement to window U-factor. This change can easily be documented by designers, either through tabular analysis or via the existing REScheck for Zone 6.

**TABLE R402.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT¹**

| CLIMATE ZONE | FENESTRATION U-FACTOR ² | SKYLIGHT ³ U-FACTOR | GLAZED FENESTRATION SHGC ⁴ | CEILING R-VALUE | WOOD FRAME WALL R-VALUE | MASS WALL R-VALUE ⁵ | FLOOR R-VALUE | BASEMENT WALL R-VALUE | SLAB ⁶ R-VALUE & DEPTH | CRAWL SPACE ⁷ WALL R-VALUE |
|-------------------|------------------------------------|--------------------------------|---------------------------------------|-----------------|----------------------------|--------------------------------|------------------|-----------------------|-----------------------------------|---------------------------------------|
| 1 | NR | 0.75 | 0.25 | 30 | 13 | 3/4 | 13 | 0 | 0 | 0 |
| 2 | 0.40 | 0.65 | 0.25 | 38 | 13 | 4/6 | 13 | 0 | 0 | 0 |
| 3 | 0.35 | 0.55 | 0.25 | 38 | 20 or 13+5 ⁸ | 8/13 | 19 | 5/13 ⁹ | 0 | 5/13 |
| 4 except Marine 4 | 0.35 | 0.55 | 0.40 | 49 | 20 or 13+5 ⁸ | 8/13 | 19 | 10/13 | 10, 2 ft. | 10/13 |
| 5 and Marine 4 | 0.32 | 0.55 | NR | 49 | 20 or 13+5 ⁸ | 13/17 | 30 ¹⁰ | 15/19 | 10, 2 ft. | 15/19 |
| 6 | 0.32 | 0.55 | NR | 49 | 20+5 or 13+10 ⁸ | 15/20 | 30 ¹⁰ | 15/19 | 10, 4 ft. | 15/19 |
| 7 and 8 | 0.32 | 0.55 | NR | 49 | 20+5 or 13+10 ⁸ | 19/21 | 38 ¹⁰ | 15/19 | 10, 4 ft. | 15/19 |

Summary of changes:

1. Fenestration U-factor: 0.35 to 0.32
2. Wood frame wall R-value: 20 or 13+5 to 20+5 or 13+10
3. Mass wall R-value: 8/13 to 15/20
4. Floor R-value: 19 to 30
5. Basement wall R-value: 10/13 to 15/19
6. Slab R-value & depth: 10, 2 ft. to 10, 4 ft.
7. Crawl space wall R-value: 10/13 to 15/19

2. Description of changes, and associated unit costs

The costs and savings were analyzed by Jeremy Shannon, principal of Prospect Architecture – a design/ build firm. Mr. Shannon is a licensed architect, Passive House consultant and tradesperson, heating specialist, and contractor.

No cost increase for window. No basement slab or crawl space analyzed, since these are not typical in NYC.

Wood Frame Wall R value -

Zone 4 = R20 or R13+5

Zone 6 = R20+5 or R13+10

R20 vs. R20+5:

- Labor change = The added R5 continuous insulation for the Zone 6 upgrade would likely result in a 1" layer of Extruded Polystyrene on the exterior of the wall assembly. On a stand along wood framed building with CDX plywood already installed over the wood frame, the 1" installation would take a carpenter and helper 1 day to install 15 4'x8' sheets including trimming around openings. This would result in about a \$1.75 per sq/ft increase in labor.
- Material cost change = Extruded Polystyrene (1"x4'x8' sheet is \$34 = \$1.05 per sq/ft)
- Total upcharge per sq/ft of surface area = \$2.80

R13+5 vs. R13+10:

- Labor change = no significant labor change for this upgrade to add one inch of continuous insulation since most insulation brands come in 2" thick sheets.
- Material cost change = (1"x4'x8' sheet is \$34. 2"x4'x8' sheet is \$66) = \$1 per sq/ft difference.
- Total upcharge per sq/ft of surface area = \$1.00

Mass wall R value -

Zone 4 = R8 exterior or R13 interior

Zone 6 = R15 exterior or R20 interior

R8 vs. R15 exterior:

- Labor = No significant change in installation from a 2" rigid board to a 3". The screws are longer for fastening and the cutting is a little thicker and therefore slightly slower. The 2" labor rate vs. the 3" would be less than a \$0.50 difference.
- Material cost change = 2"x4'x8' sheet of Extruded Polystyrene is \$64. A 3"x4'x8' sheet is \$96 (Cost pending). Difference is \$1 per sq/ft.

- Total upcharge per sq/ft of surface area = \$1.50
- R13 vs. R20 interior:
- Labor = 3.5" of Cellulose densepack insulation would be an acceptable method of achieving the Zone 4 R13 requirement and wouldn't be downgraded in R value as would batt insulation that has gaps and mis-sized pieces. Upgrading to R20 for Zone 6 would require either a 2x6" wall installed inside of the masonry wall or better still the same 2x4" wall pulled out from the masonry to create a 2" gap between the masonry and wood. This shift in framing results in minimal labor cost changes since it is just a different layout for framing but not more work. The added time to blow in the 2" additional cellulose material does add labor time. To densepack a 3.5" wall cavity the labor charge is \$2.5 per sq/ft and for 5.5" it is \$2.75 per sq/ft. Difference of \$0.25 per sq/ft.
 - Material cost change = For a 3.5" wall the cellulose material cost is \$1. The cost of material for a 5.5" wall cavity is \$1.55. Difference of \$0.55 per sq/ft.
 - Total upcharge per sq/ft of surface area = \$0.80

Basement Wall R Value -

Zone 4 = R10/13

Zone 6 = R15/19

R10 continuous vs. R15 continuous insulation:

- Labor = No significant change in installation from a 2" rigid board to a 3". The screws are longer for fastening and the cutting is a little thicker and therefore slightly slower. The 2" labor rate vs. the 3" would be less than a \$0.50 difference.
- Material cost change = 2"x4'x8' sheet of Extruded Polystyrene is \$64. A 3"x4'x8' sheet is \$96 (Cost pending). Difference is \$1 per sq/ft.
- Total upcharge per sq/ft of surface area = \$1.50

R13 cavity vs. R19 cavity insulation:

- Labor = 2x4" wall pulled out from the masonry to create a 2" gap between the masonry and wood. This shift in framing results in minimal labor cost changes since it is just a different layout for framing but not more work. The added time to blow in the 2" additional cellulose material does add labor time. To densepack a 3.5" wall cavity the labor charge is \$2.5 per sq/ft and for 5.5" it is \$2.75 per sq/ft. Difference of \$0.25 per sq/ft.
- Material (Fiberglass Batt) = R13 batt insulation \$0.35 per sq/ft. R19 Batt insulation \$0.55 per sq/ft. Difference of \$0.20 per sq/ft.
- Material (Cellulose densepack) = 2" additional densepack = \$0.55 per sq/ft
- Total cost difference for Batt Insulation = \$0.20 per sq/ft of surface area.
- Total cost difference for Cellulose Densepack Insulation = \$0.80 per sq/ft of surface area.

Floor R Value – (Note that this was not included in either of the examples provided.)

Zone 4 = R19

Zone 6 = R30

- Labor = The Zone 6 code allows for use of R19 if the framing cavity will not allow R30 therefore there is no labor upcharge for this work. To put in a thicker batt insulation between the cavity involves no additional labor. If this insulation is being put in using densepack cellulose then there would be an additional minor labor upcharge of \$0.50 per sq/ft for the addition pumping/install time.
- Material (Fiberglass Batt) = R19 batt insulation \$0.55 per sq/ft. R30 Batt insulation \$0.60 per sq/ft. Difference of \$0.05 per sq/ft.
- Material (Cellulose densepack) = 3" additional densepack = \$0.75 per sq/ft
- Total cost difference for Batt Insulation = \$0.05 per sq/ft of surface area.
Total cost difference for Cellulose Densepack Insulation = \$1.25 per sq/ft of surface area.

3. Analysis of Energy Savings

See attached PHPP software analysis.

4. Cost/ Benefit Analysis for Typical Residential Properties

Case 1a (most cost effective strategy): Sample 3 Story/w cellar Masonry Townhouse

Cost increase from Zone 4 to Zone 6 Construction:

Assumed 18'x45' = 2430 sq/ft + 800 sq/ft Cellar. Two side walls are attached party walls.

Changes and associated incremental cost increases:

- Mass Wall = $30 \times 18 \times 2 = 1080$ sq/ft of exposed surface area = $1080 \times \$0.80 = \864 . (Assumption – going from R-13 interior to R-20 interior)
- Bsmt./Cellar Walls = $10 \times 18 \times 2 = 360$ sq/ft of surface area = $360 \times \$0.80 = \288 . (Assumption – going from R-13 to R-19 cavity)
- Crawl space and slab: Not applicable – no crawl space and basement slab is more than 2' below grade.

- Total estimated cost increase per townhouse = \$1,152
- Cost increase per sq/ft of floor area (3,230) = \$0.36 per sq/ft
- Average cost per sq/ft of floor area for new construction = \$300 per sq/ft
- Percentage of Construction Cost increase over base = 00.12%

Annual Energy Savings

- Townhouse Heating savings for Zone 6 upgrade: 48.25 Therms (100,000 BTU per Therm); assuming 80% heating system efficiency: 68.31 Therms savings
- Townhouse Cooling savings for Zone 6 upgrade: 78.41 Therms
- *Determined by modeling house in PHPP software – see attached.*

Annual Cost Savings:

- Heating: Average yearly dollar savings from thermal performance = \$68 (Assuming \$1.00 per Therm based on statewide averages on NYSERDA's site.)
- Cooling: 78.41 Therms = 7.841 MM BTU = 2,298 kWhr; Assuming AC COP of 4: 574.5 kWhr purchased = \$109 (assuming electrical costs of \$0.19 per kWhr.)
- Total savings: \$177
- **Simple Payback = \$1,152/ \$177 = 6.5 years**

Case 2a (most cost effective strategy): Sample 2 Story/w Basement Fully Detached Framed house

Cost increase from Zone 4 to Zone 6 Construction

Assumed 2-stories 25'x30' = 1,500 sq/ft + 750 sq/ft basement.

Changes and associated incremental cost increases:

- Framed Walls = 20' x 110' = 2200 sq/ft of exposed surface area = 2200 x \$1.00 = \$2,200. (Assumption: going from R13+5 to R13+10)
- Bsmt. Walls = 10' x 100' = 1000 sq/ft of surface area = 1000 x \$0.80 = \$800.
- Crawl space and slab: Not applicable – no crawl space and basement slab is more than 2' below grade.
- Total estimated cost increase detached house = \$3,000
- Cost increase per sq/ft of floor area (2,250) = \$1.33 per sq/ft
- Average cost per sq/ft of floor area for new construction = \$300 per sq/ft
- Zone 6 increase in percentage of Construction Cost increase = 00.44%

Annual Energy Savings:

- Heating savings for Zone 6 upgrade: 154.75 Therms (100,000 BTU per Therm); assuming 80% heating system efficiency: 193.44 Therms
- Cooling savings for Zone 6 upgrade: 249.08 Therms

- *Determined by modeling house in PHPP software – see attached.*

Annual Cost Savings:

- Heating: Average yearly dollar savings from thermal performance = \$193 (Assuming \$1.00 per Therm based on statewide averages on NYSERDA's site.)
- Cooling: 249.1 Therms = 24.91 MM BTU = 7,301 kWhr; Assuming AC COP of 4: 1,825 kWhr purchased = \$347 (assuming electrical costs of \$0.19 per kWhr.)
- Total savings: \$540 per year
- **Simple Payback = \$3,000 / \$540 = 5.6 years**

Summary: These measures are very cost effective, with a less than 10-year payback period. But since the envelope typically lasts a minimum of 50 years (exclusive of windows and some siding materials, which are not relevant to this provision), these measures are extraordinarily cost effective when viewed over their life cycle, paying for themselves many times over.

- 7.7 times in 50 years for the townhouse
- 9.0 times in 50 years for the single family house.

Reference Material: Alternative Insulation Strategies with less cost efficiency for both Case studies:

Case 1b (middle cost efficacy): Sample 3 Story/w cellar Masonry Townhouse

Cost increase from Zone 4 to Zone 6 Construction:

Assumed 18'x45' = 2430 sq/ft + 800 sq/ft Cellar. Two side walls are attached party walls.

Changes and associated incremental cost increases:

- Mass Wall = $30 \times 18 \times 2 = 1080$ sq/ft of exposed surface area = $1080 \times \$0.80 = \864 . (Assumption – going from R-13 interior to R-20 interior)
- Bsmt./Cellar Walls = $10 \times 18 \times 2 = 360$ sq/ft of surface area = $360 \times \$1.50 = \540 . (Assumption – going from R10 continuous vs. R15 continuous insulation)
- Crawl space and slab: Not applicable – no crawl space and basement slab is more than 2' below grade.
- Total estimated cost increase per townhouse = \$1,404
- Cost increase per sq/ft of floor area (3,230) = \$0.43 per sq/ft
- Average cost per sq/ft of floor area for new construction = \$300 per sq/ft
- Percentage of Construction Cost increase over base = 00.14%

Annual Energy Savings

- Townhouse Heating savings for Zone 6 upgrade: 48.25 Therms (100,000 BTU per Therm); assuming 80% heating system efficiency: 68.31 Therms savings
- Townhouse Cooling savings for Zone 6 upgrade: 78.41 Therms
- *Determined by modeling house in PHPP software – see attached.*

Annual Cost Savings:

- Heating: Average yearly dollar savings from thermal performance = \$68 (Assuming \$1.00 per Therm based on statewide averages on NYSERDA's site.)

- Cooling: 78.41 Therms = 7.841 MM BTU = 2,298 kWhr; Assuming AC COP of 4: 574.5 kWhr purchased = \$109 (assuming electrical costs of \$0.19 per kWhr.)
- Total savings: \$177
- **Simple Payback = \$1,404/ \$177 = 7.9 years**

Case 2b (middle cost efficacy): Sample 2 Story/w Basement Fully Detached Framed house

Cost increase from Zone 4 to Zone 6 Construction

Assumed 2-stories 25'x30' = 1,500 sq/ft + 750 sq/ft basement.

Changes and associated incremental cost increases:

- Framed Walls = 20' x 110' = 2200 sq/ft of exposed surface area = 2200 x \$1.00 = \$2,200. (Assumption: going from R13+5 to R13+10)
- Bsmt. Walls = 10' x 100' = 1000 sq/ft of surface area = 1000 x \$1.50 = \$1,500.
- Crawl space and slab: Not applicable – no crawl space and basement slab is more than 2' below grade.
- Total estimated cost increase detached house = \$3,700
- Cost increase per sq/ft of floor area (2,250) = \$1.64 per sq/ft
- Average cost per sq/ft of floor area for new construction = \$300 per sq/ft
- Zone 6 increase in percentage of Construction Cost increase = 00.55%

Annual Energy Savings:

- Heating savings for Zone 6 upgrade: 154.75 Therms (100,000 BTU per Therm); assuming 80% heating system efficiency: 193.44 Therms
- Cooling savings for Zone 6 upgrade: 249.08 Therms
- *Determined by modeling house in PHPP software – see attached.*

Annual Cost Savings:

- Heating: Average yearly dollar savings from thermal performance = \$193 (Assuming \$1.00 per Therm based on statewide averages on NYSERDA's site.)
- Cooling: 249.1 Therms = 24.91 MM BTU = 7,301 kWhr; Assuming AC COP of 4: 1,825 kWhr purchased = \$347 (assuming electrical costs of \$0.19 per kWhr.)
- Total savings: \$540 per year
- **Simple Payback = \$3,700/ \$540 = 6.9 years**

Case 1c (least cost efficacy): Sample 3 Story/w cellar Masonry Townhouse
Cost increase from Zone 4 to Zone 6 Construction:

Assumed 18'x45' = 2430 sq/ft + 800 sq/ft Cellar. Two side walls are attached party walls.

Changes and associated incremental cost increases:

- Mass Wall = $30 \times 18 \times 2 = 1080$ sq/ft of exposed surface area = $1080 \times \$1.50 = \$1,620$. (Assumption – going from R8 vs. R15 exterior)
- Bsmt./Cellar Walls = $10 \times 18 \times 2 = 360$ sq/ft of surface area = $360 \times \$1.50 = \540 . (Assumption – going from R10 continuous vs. R15 continuous insulation)
- Crawl space and slab: Not applicable – no crawl space and basement slab is more than 2' below grade.
- Total estimated cost increase per townhouse = \$2,160
- Cost increase per sq/ft of floor area (3,230) = \$0.67 per sq/ft
- Average cost per sq/ft of floor area for new construction = \$300 per sq/ft
- Percentage of Construction Cost increase over base = 00.22%

Annual Energy Savings

- Townhouse Heating savings for Zone 6 upgrade: 48.25 Therms (100,000 BTU per Therm); assuming 80% heating system efficiency: 68.31 Therms savings
- Townhouse Cooling savings for Zone 6 upgrade: 78.41 Therms
- *Determined by modeling house in PHPP software – see attached.*

Annual Cost Savings:

- Heating: Average yearly dollar savings from thermal performance = \$68 (Assuming \$1.00 per Therm based on statewide averages on NYSERDA's site.)
- Cooling: 78.41 Therms = 7.841 MM BTU = 2,298 kWhr; Assuming AC COP of 4: 574.5 kWhr purchased = \$109 (assuming electrical costs of \$0.19 per kWhr.)
- Total savings: \$177
- **Simple Payback = $\$2,160 / \$177 = 12.2$ years**

Case 2c (least cost efficacy): Sample 2 Story/w Basement Fully Detached Framed house

Cost increase from Zone 4 to Zone 6 Construction

Assumed 2-stories 25'x30' = 1,500 sq/ft + 750 sq/ft basement.

Changes and associated incremental cost increases:

- Framed Walls = 20' x 110' = 2200 sq/ft of exposed surface area = 2200 x \$2.80 = \$6,160. (Assumption: going from R20 vs. R20+5)
- Bsmt. Walls = 10' x 100' = 1000 sq/ft of surface area = 1000 x \$1.5 = \$1,500.
- Crawl space and slab: Not applicable – no crawl space and basement slab is more than 2' below grade.
- Total estimated cost increase detached house = \$7,660
- Cost increase per sq/ft of floor area (2,250) = \$3.40 per sq/ft
- Average cost per sq/ft of floor area for new construction = \$300 per sq/ft
- Zone 6 increase in percentage of Construction Cost increase = 1.13%

Annual Energy Savings:

- Heating savings for Zone 6 upgrade: 154.75 Therms (100,000 BTU per Therm); assuming 80% heating system efficiency: 193.44 Therms
- Cooling savings for Zone 6 upgrade: 249.08 Therms
- *Determined by modeling house in PHPP software – see attached.*

Annual Cost Savings:

- Heating: Average yearly dollar savings from thermal performance = \$193 (Assuming \$1.00 per Therm based on statewide averages on NYSERDA's site.)
- Cooling: 249.1 Therms = 24.91 MM BTU = 7,301 kWhr; Assuming AC COP of 4: 1,825 kWhr purchased = \$347 (assuming electrical costs of \$0.19 per kWhr.)
- Total savings: \$540 per year
- **Simple Payback = \$7,660/ \$540 = 14.2 years**

Additional Impacts

For buildings that are built out to the lot lines and/or zoning setbacks, the increased insulation will result in the loss of some floor area. The area loss is typically 1" thick on each exterior wall.

- For the townhouse, this amounts to 1" x 18' = 1.5 sq/ft of area on each (of 8) exterior walls, including the basement or 1.5 x 8 = 12 sq/ft out of a total of 3,230 sq/ft or an 0.37% loss of square footage.
- For the freestanding house, this amounts to 1" x 110' = 9.17 sq/ft per floor on each of 3 floors including the basement = 27.5 sq/ft. or 1.22% loss of square footage.



MEMO

Date: 20 June 2016
To: Gina Bocra, New York City, Department of Buildings
From: Paula Zimin, Steven Winter Associates, Inc.
Re: NYC ECC: Mechanical Penetrations as Opaque Envelope Components

Introduction

Steven Winter Associates, Inc. (SWA) prepared the following study to determine the cost impacts of accounting for thermal transfer through air conditioning units in wall penetrations when modeling energy code compliance.

SWA used COMcheck software for a sample affordable multifamily development, which SWA believes to be representative of this building type. The building includes studios, 1-, 2-, and 3-bedroom units, and the mechanical penetrations are PTAC units. The study evaluates mass wall construction and steel-framed wall construction and assumes an R-value of 2 for the PTAC penetrations.

SWA analyzed the cost and savings associated with two solutions to compensate for the energy lost through thermal bridging of the PTAC units: increasing insulation or improving windows.

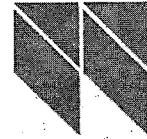
Summary of Conclusion

SWA found that increasing insulation to offset accounting for the PTAC R-value was very cost effective for both mass wall construction and steel-framed construction. For both construction types, increasing insulation would cost roughly \$35 per apartment unit, with a cost-effective payback period: 3.1 years for the mass wall building and 4.4 years for the steel-framed building. Improving windows resulted in paybacks roughly ten times longer, mostly because the code compliant windows used are industry standard. It is expected that developers will opt for the more cost-effective path of increased wall insulation, especially since such walls are already standard practice in the affordable housing community.

Analysis

Sample Building Information Introduction

| | |
|------------------------------|--------------------------|
| Total Conditioned Area: | Approximately 300,000 SF |
| Parking Garage: | No |
| Number of Apartment Units | 300 |
| Gross Above Grade Wall Area: | 131,562 SF |
| Total Window Area (WWR): | 31,025 SF (24%) |
| Total PTAC Area (MWR): | 3,355 SF (2.5%) |



Methodology

SWA first determined the minimally compliant building assemblies to meet code as confirmed by COMcheck in a base case without accounting for the thermal bridging of PTACs. SWA then determined the improvements to the windows or walls required to meet code as confirmed by COMcheck when including the PTAC units as an R-2 opaque wall assembly in the compliance calculation.

Minimally Compliant Building Envelope Assemblies per ASHRAE 90.1-2013, Table 5.5-4

Construction Type 1

| | |
|--------------------|--|
| Wall-Type: | Mass Wall |
| Wall U-factor: | U-0.090 |
| COMCheck Assembly: | R-8.6 continuous insulation + 8" Med Weight, Partially Grouted |
| Fenestration: | Metal framing (all other) |
| Window U-factor: | U-0.42 (fixed) |

Construction Type 2

| | |
|--------------------|--|
| Wall-Type: | Steel-Framed Wall |
| Wall U-factor: | U-0.064 |
| COMCheck Assembly: | R-7.5 continuous insulation + R-13 insulation in studs, 16 inches o.c. |
| Fenestration: | Metal framing (all other) |
| Window U-factor: | U-0.42 (fixed) |

Assumptions

SWA assumed a PTAC size of 36"x20" or approximately 5 SF. It was assumed that one PTAC would be installed in each bedroom and living room (one in each studio). PTAC assembly insulation values were assumed to be R-2. Window performance assumes all windows are fixed, which is the more stringent performance and therefore provides for a more conservative analysis. No additional analysis relative to thermal bridging within a specific wall assembly was evaluated in this study.

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Results: Minimally Compliant Wall Assemblies

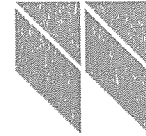
The results provided below define what additional insulation would be necessary to overcome the reduced insulation of opaque areas at mechanical penetrations such as PTACs. In each case, an improvement is recommended for EITHER the continuous wall insulation OR the window performance. However, a mix of both could be used to achieve compliance in COMcheck. In addition, improvements to roof and/or floor insulation were not analyzed, but can also benefit the compliance efforts.

| Additional Envelope Performance Improvements | | | |
|--|--|----|---------------------------|
| | Additional Continuous Insulation R-Value | | Window: Improved U-factor |
| Construction Type 1 | | | |
| Mass Wall+PTAC @2.5% MWR | 1.65 | OR | U-0.399 |
| Construction Type 2 | | | |
| Steel-framed+PTAC @2.5% MWR | 4 | OR | U-0.389 |

Building Energy Cost Implications

As part of this study, SWA also evaluated the energy cost benefits and potential construction cost impacts of the envelope improvements outlined above. SWA used commercially available building materials to evaluate construction cost increases. For each minimally compliant wall assembly, SWA has assumed 2" Mineral Fiberboard Insulation (R-8.4) as the primary code compliant exterior insulation material, and 2-1/8" XPS Insulation (R-12) as the improved exterior insulation material. Below is a comparison of costs for the envelope materials:

| Material | Installed Cost Estimates |
|---|--------------------------|
| 2" Mineral Fiberboard Insulation (R-8.4) | \$1.96 / SF |
| 2-1/8" XPS Insulation (R-12) | \$2.06 / SF |
| Thermally Broken Aluminum Frame, Double Pane Window, Air-fill (U-0.42) | \$957.58 / window |
| Thermally Broken Aluminum Frame, Double Pane Window, Argon-fill (U-0.389) | \$985.26 / window |



The below table describes the energy cost impact for this project by area using the materials outlines above. Overall, the impact of the PTAC penetrations results in a higher total annual building energy cost of about \$2,500.

The recommended insulation improvement from R-8.4 to R-12 exterior insulation is a cost increase of about \$0.10 / SF of net wall area. For this example building, the overall cost increase for the insulation improvement would be approximately \$10,000 – or \$33.33 per apartment -- with a simple payback of 3-4 years.

Alternatively, the overall cost increase for higher performing windows would be about \$28 per window, or a total of approximately \$39,500 for this example building. The window improvement has a much longer simple payback, so it is unlikely to be the alternative chosen.

| Wall Type | Code Compliance Envelope Strategy | Energy Cost / Bldg GSF | Additional Cost \$ | Simple payback (years) |
|-------------------|--|------------------------|--------------------|------------------------|
| Mass Wall | Minimally Code Compliant Wall (with R-8.6 Exterior Insulation) | \$1.06 | | |
| | Minimally Code Compliant Wall (R-8.6 derated with PTAC Penetrations) | \$1.07 | | |
| | R-12 Exterior Insulation | \$1.05 | \$10,000 | 3.1 |
| | Thermally Broken Aluminum Frame, Double Pane Window, Fixed, U-0.399 | \$1.06 | \$39,513 | 43.6 |
| Steel-Framed Wall | Minimally Code Compliant Wall (R-7.5 Exterior Insulation) | \$1.04 | | |
| | Minimally Code Compliant Wall, Derated with PTAC Penetrations | \$1.05 | | |
| | R-12 Exterior Insulation | \$1.04 | \$10,000 | 4.4 |
| | Thermally Broken Aluminum Frame, Double Pane Window, Fixed, U-0.389 | \$1.04 | \$39,513 | 30.4 |

The following utility rates were used to derive the values in the above table:

Electric Costs = \$0.18 / kWh
 Gas Costs = \$1.28 / Therm

Conclusion

PTAC penetrations will reduce the overall insulation effectiveness of any building envelope, however, this can be easily overcome with little or no cost increase with improved exterior insulation or windows. Note these studied strategies are already well integrated with current construction practices within the affordable housing community.



FOR THE RECORD

June 22, 2016

Testimony of the New York Coalition of Code Consultants on Intro 1169-2016

Good morning. My name is Josh Knoller and I'm testifying on behalf of the New York Coalition of Code Consultants (NYCCC). NYCCC is a non-profit membership trade organization whose members specialize in securing construction and development approvals from municipal agencies, as well as building code and zoning consulting. We provide expertise to real estate owners, developers, architects, and engineers and our members help manage billions of dollars in construction activity in New York annually.

As consultants advising our clients on the compliance of many codes including the State Energy Code and the New York City Energy Conservation Code (NYCECC), NYCCC supports Intro 1169 to conform the New York City Energy Conservation Code to the New York State Energy Code.

Having experienced the recent code change in January 2015, NYCCC understands the time the industry needs to absorb the changes, which is why NYCCC respectfully asks that the Council pass this legislation in a timely fashion. Once this legislation is signed by the Mayor, the City will also be required to amend the Rules of the City of New York. Additionally, the DOB will need to conduct outreach and trainings regarding the code change and a text integration.

We thank the City Council for working with the Department of Buildings on this important code change. From the industry perspective, we applaud your efforts to date and hope that you will pass Intro 1169 so that the industry can be most prepared before the code changes take effect on October 3rd. Thank you.



Getting rid of an oversized boiler

By Daniel Karpen, PE.

In March 2014, I was called in by a property owner of a 6-unit apartment building on 42nd Street in the Sunnyside section of Queens, N.Y. From April 2013 through February 2014, fuel oil deliveries to the building totaled 2,900 gallons of Number 2 fuel oil; the cost was \$13,760.43. Thus, the building usage was approximately 600 gallons of fuel oil per apartment unit per year, and the cost was approximately \$2,500 per unit per year. Because the owner did not own the building for less than one year, the annual fuel oil usage and annual cost per year are approximate.

In order to make the building more profitable and to cut the amount of energy used, I was called in to prepare an energy conservation management plan for the building. As time was critical in cutting costs, from the time of the site visit to the presentation of the report to the owner was less than one week, unheard of service in the engineering industry.

The building was built in 1927 as a 3-story walk up, and the apartments were more or less original. These were two apartments on each floor. The one pipe steam system was more or less original. The boiler room was in the cellar along with a shop space.

The boiler was a Weil-McLain low pressure steam boiler, model 336-576-SW. The name plate which would have had the serial number was missing from

the boiler so all I could assume was that the boiler was between 40 and 60 years old.

The boiler is rated to be fired at 2.95 gallons of Number 2 fuel oil per hour. The existing burner firing Number 2 fuel oil was a Carlin Model 200 CRD. The exact firing rate of the boiler at the time of my inspection was not known as I did not take inspect the nozzle. The boiler was running rough, and the oil pressure

To determine the size of a new separate low pressure steam boiler, I performed an ASHRAE peak heating load calculation.

gauge was defective. I did not perform a combustion efficiency test.

The boiler had a tankless coil feeding domestic hot water to the six apartments. The boiler had a 3-inch tapping feeding the two, 2-inch diameter lines to the two risers at the front and rear of the building.

There was 75 feet of uninsulated steam and condensate lines in the cellar. The remaining lines had 1-inch thick pipe insulation.

My recommendations

Con Ed gas was available in the building and was used for cooking in the apartments. The line was sized sufficiently to convert from oil to gas without having to dig up the street.

Because of the development of very efficient condensing hot water boilers, I determined to separate the domestic hot water from the steam heating system. I selected a Navien model NPE-240 tankless water heater with an input of 199,000 BTU of natural gas per hour.

To determine the size of a new separate low pressure steam boiler, I performed an ASHRAE peak heating load calculation. The owner supplied me with a sketch of the building with wall dimensions and the locations

of the windows. I measure all the windows and came up with a peak heating load at an inside design temperature of 68 degrees and an outside temperature of 12 degrees. The heating load in the apartments was 60,732 BTU per hour. I added 20 percent for losses in the boiler room and basement, and the design heating load was 75,915 BTU per hour. Assuming a boiler efficiency of 83 percent, the BTU input was 91,464 BTU of gas per hour. I selected a U.S. Boiler Company Independence PIN3PV boiler with a firing rate of 105,000 BTU per hour of

In my energy conservation management plan, I estimated future costs at about \$3,000 per year, an 80 percent reduction in costs.

natural gas. The next smallest boiler was deemed inadequate to heat the building at peak load conditions.

Next, I went into the apartment units to look at the radiators. The apartments had a great deal of overheating. This problem was due to the oversized radiators, which became more oversized after the installation of new double glazed windows. One apartment had thermostatic radiator valves. It was deemed cheaper to install new smaller radiators in the other five units with an output of 1,536 BTU per hour (6.4 square feet EDR) per radiator than to put TRVs on the existing radiators. I also recommend the following work:

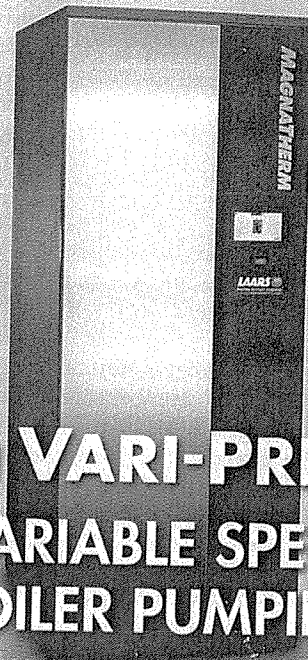
- Insulate all lines in the boiler room with 2-inch thick pipe insulation.
- Install 2-gallon per hour showerheads in all showerheads.
- Install a Honeywell Vaporstat and set it at .3 psi. The maximum distance from the boiler to the farthest radiator was less than 100 feet. Also, keeping the steam pressure low reduces the possibility of steam pipe knocking problems.
- Install a solenoid activated outside air damper on the 10 inch by 10 inch outside air intake to the boiler room.
- Reset the Platinum Heat Timer to the lowest possible setting.
- Install 1/2-inch pipe insulation on the lower 4 feet of all risers in the apartments.
- Weatherstrip the rooftop bulkhead door.

In my energy conservation management plan, I estimated future costs at about \$3,000 per year, an 80 percent reduction in costs. I should note that November gas bill came from ComEd, and the owner told me it was only \$93. He thought it was a mistake. I told him that it was real. The payback period on the energy conservation work was two years. ■

Daniel Karpen is a professional engineer with 34 years of experience in energy conservation engineering. He is based in Huntington, N.Y., and he is licensed to practice engineering in New York State. He can be reached at 631-427-0723 or www.danielkarpen.com.

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How *not* to install a steam boiler

By Daniel Karpen, P.E.

Question: How do you get an elephant out of a box of Jello?

Answer: Just follow the directions on the back of the package.

Question: How do you get a boiler installed in a basement?

Answer: Just follow the instruction manual in the bottom of the crate.

For a project, I was called in by an architect to inspect the heating system in her house and try to figure out what was causing the steam pipe banging problems. The house was a wood frame house on Henry Street in Brooklyn Heights, N.Y., which was built around 1830. It was a stately townhouse, in amazingly good condition. Except for one really big problem: the banging steam pipe.

What do I do in this case? There are three things to look for when there is a banging steam pipe: 1.) the rating of the boiler and the design of the steam piping, 2.) the BTU load of the attached radiation, and 3.) the actual fuel usage during the coldest time of the year.

Beginning with the steam system, what we had in the house was a hybrid one and two pipe steam system (yes, I do see them from time to time). The boiler was a low pres-

Here were two functional cast iron radiators that could have been as old as 140 years. Have you seen mechanical equipment last that long? There were also two similar radiators in the house, as well as other radiators from the early part of the 20th century.

sure Weil McLain EGH-85-S. It was gas fired, with an input of 315,000 BTU per hour and an output of 243,000 BTU per hour of steam. The boiler was several years old and in excellent condition.

Next, I looked at the steam piping above the boiler. It is absolutely essential that it be installed correctly, or else you will have problems. The manual for the boiler from the manufacturer called for a 3-inch diameter header between the two boiler tapings. But, it seemed the

plumber who installed the boiler (who had been in plumbing for 42 years) never opened and read the manual. He put in a 2-inch diameter header.

I thought that "old timers" are supposed to know their stuff. This fellow didn't, but he thought he knew it all.

The next problem was that the distance from the water line to the bottom of the header was supposed to be a minimum of 24 inches, according to the boiler manufacturer's instructions. In this case, it was only 20 inches. That was insufficient to separate the condensate in the boiler from the steam and provide "dry steam."

Also, there was supposed to be 28 inches from the boiler water line to the bottom of the lowest steam carrying line. This was not the case. Again, an issue of not following the boiler manufacturer's instructions.

Now, for the engineering issues. The main steam line carrying steam to the radiators was just 2 inches in diameter. Guess what? This line is capable of carrying only 92,640 BTU per hour of steam.

Next, I inventoried the attached radiation load. I measured the length, height, and width of every radiator, and took notes on the number of sections, and type of tubes and their size. The house was a mini-museum of old steam radiators. There was an old Griffing Iron Company radiator inscribed with a patent date of September 22, 1874. Imagine that!

Here were two functional cast iron radiators that could have been as old as 140 years. Have you seen mechanical equipment last that long? There were also two similar radiators in the house, as well as other radiators from the early part of the 20th century.

One square feet of radiation will emit 240 BTU per hour at a steam pressure of 2 psi. So, I summed up the total EDR in the house. It was approximately 111,312 BTU per hour. I then add a pickup factor for the steam to get to the radiators.

Continued on page 74

Steam

Continued from page 72

The plumber selected the boiler on a whim, and not on any engineering analysis. I told him that if he ever had a problem with a steam heating system, he can call in an engineer to perform the technical analysis.

For my energy conservation work, I insulate all steam and condensate

lines with 3 inches of fiberglass pipe insulation, and my pickup factor is based on the heat losses of pipes buried in the walls of a building. The next step in my evaluation of a steam system is to compare the actual usage of fuel against the attached radiation load. I look at the coldest part of the

winter.

ASHRAE peak heating load calculations are useful, but if you have fuel usage data then you really know what is going on in your building. At the time, the most recent cold period was February 2015. Average usage of fuel was 17 Therms per day, or 70,833 BTU per hour. Assuming the boiler was 80 percent efficient, the average amount of heat required by the building was 56,700 BTU per hour. Not only was the boiler oversized, but the radiators were oversized as well for the house. If we put in smaller radia-

ASHRAE peak heating load calculations are useful, but if you have fuel usage data then you really know what is going on in your building. At the time, the most recent cold period was February 2015. Average usage of fuel was 17 Therms per day, or 70,833 BTU per hour.

tors and reduced the radiation load to under 92,640 BTU per hour, we could have a steam system that could behave itself.

Due to the location of the steam lines in a very narrow crawl space, it was impossible to put in larger lines, except at an enormous expense. The key was to select a boiler with a steam output of not more than 92,640 BTU per hour. Next, we had to perform a heat load analysis of every space in the house and take out the largest radiators, and move smaller radiators around to balance the steam system. The, we purchased some small radiators to replace the largest ones.

With all of the work done, the steam system was as quiet as a mouse.

Daniel Karpen is a professional engineer with over 30 years of experience in energy conservation engineering. He is based in Huntington, N.Y., and he is licensed to practice engineering in New York State. He can be reached at 631-427-0723 or www.danielkarpen.com.

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Why do my vertical steam risers bang so much?

By Daniel Karpen, P.E.

The problems that I find in steam heating systems never fail to amuse me. I was called in by the owner of a four-story brownstone of about 4,000 square feet in the Park Slope area of Brooklyn. He told me that he had very severe steam pipe banging problems.

It is not unusual to see steam pipe banging problems in horizontal steam lines. However, in this case, the steam pipe banging problems were in the vertical risers. This is a very serious problem that is not terribly unusual.

So where did I start? I needed to look at three things: 1.) the BTU output of the boiler 2.) the BTU rating of the steam radiators and 3.) the actual use of fuel by the building.

I went into the basement, accompanied by the owner of the brownstone. The boiler was a Weil McLain model EGH-105, fired by natural gas. The input to the boiler was 450,000 BTU per hour, and its rated output was 360,000 BTU per hour. The boiler was relatively recently installed, about 2010.

When you have excessive steam flowing up a riser that exceeds its capacity, you will have condensate held up in suspension in the vertical risers. You will have water hammer, spitting vents, uneven heat and water level problems in the boiler.

The owner of the house had it entirely gutted and renovated several years ago. New double glazed Low-E windows were installed on the northern front and southern rear sides of the house. The ceiling of the upper floor was insulated heavily with thick closed cell polyurethane spray foam insulation.

The house was almost a passive house. The peak heat-

ing load was the lowest I have ever seen in any building of its size. In February 2015, the fuel usage for building heat was only 230 CCF of gas. This amount is astonishingly low. That winter was one of the coldest in the past 70 years.

Now, let's look at the steam heating system. There are two main steam lines leading to the radiators at the front and rear of the house. Each main steam line is 2 inches in diameter. According to Dan Holohan's book, "The Lost Art of Steam Heating," each steam line has a capacity of approximately 92,640 BTU per hour. The total capacity of two steam lines is about 183,280 BTU per hour.

This boiler was oversized by a factor of two to feed the main steam lines.

Every radiator in the house was measured to determine its BTU output. BTU ratings of radiators were taken from standard charts in accordance with Holohan's book, "EDR, Every Darn Radiator." The total output of the radiators was determined to be about 81,360 BTU per hour.

This boiler was oversized by a factor of four to feed the radiators.

There were two risers; one at 1-1/2 inches in diameter and the other at 1-1/4 inches in diameter. Holohan gives the BTU rating of vertical risers for one pipe steam systems.

In this case, the maximum capacity of the risers was determined to be approximately 96,480 BTU per hour. It appeared that the original design of the steam system was correct.

When you have excessive steam flowing up a riser that exceeds its capacity, you will have condensate held up in suspension in the vertical risers. You will have water hammer, spitting vents, uneven heat and water level problems in the boiler.

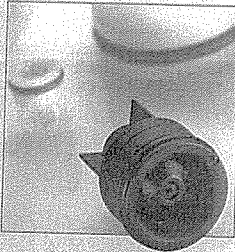
However, the actual average peak heating load at the beginning of 2015 was a small fraction of the capacity of the output of the boiler. From February 5, 2015 until March 6, 2015, the usage of gas for heating was approximately

Continued on page 84

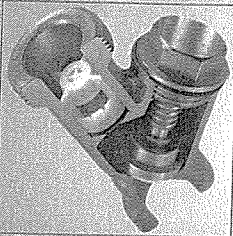
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Steam

Continued from page 82

110 CCF. At 103,000 BTU per CCF, the hourly average usage of gas was only 16,278 BTU per hour. Thus, the boiler was oversized by a factor of 27.6!

What was I supposed to do? The owner did not want to spend the money to install a smaller boiler, as there was no return on this investment. So, I recommended the installation of a Honeywell Vaporstat Model L408J controller.

One might be able to overcome the steam pipe banging problem by setting the steam pressure extremely low at no more than 2 ounces. The idea is to keep the boiler pressure very low so that condensate can fall down against the extremely low steam pressure and not be held in suspension. It should be noted that the highest steam velocity occurs at start up at zero pressure.

Installers of steam boilers need to perform the necessary inspection work prior to the selection of a steam boiler. If in doubt as to what to do, recommend to the owner of the building that they hire an engineer to do the heating load analysis. In every case, it is money well spent. ■

Daniel Karpen is a professional engineer with over 30 years of experience in energy conservation engineering. He is based in Huntington, New York, and he is licensed to practice engineering in New York state. He can be reached at 631-427-0723 or www.danielkarpen.com.

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**Testimony before the Committee on Housing and Buildings
of the New York City Council
By Carl Hum, Senior Vice President
Real Estate Board of New York
June 22, 2016**

Good morning Chairperson Williams and members of the Committee on Housing and Buildings. The Real Estate Board of New York, representing over 17,000 owners, developers, managers, and brokers of real property in New York City, thanks you for the opportunity to testify regarding the update to the New York City Energy Conservation Code. We appreciate our continuing dialogue with the Housing and Buildings Committees, and thank Chairman Williams for his leadership and his continuous communication with the real estate industry.

The new code will enact meaningful increases in energy savings over existing law, and we appreciate the willingness of the Department of Buildings to lead the nation on issues such as air leakage testing. We have been actively engaged in discussions with our membership to help ensure the proposal achieves the increased energy efficiencies of the New York State Energy Code, without introducing avoidable costs or burdens on building operators. We have outlined below several changes that we believe will improve the bill in this regard.

104.1 Inspections

- We believe the included exception for the installation and replacement of heating equipment and appliances must be broadened to allow for the provision of temporary heat during construction before the issuance of a temporary certificate of occupancy.

104.2.1 New, altered, extended, renovated or repaired systems

- The language of this paragraph is overly broad. “Shall be tested” should be changed to “shall be tested or inspected as applicable” to avoid expansion of testing thresholds by rule.

104.2.2 Apparatus, instruments, material and labor for tests

- This paragraph should be removed as it unnecessarily restricts the performance of testing. Instrumentation is normally provided by testing agencies, and thus permit holders should not be required to furnish instruments.

104.4 Temporary connection

- Additional allowances for the use of temporary connections must be added. Common rationales for the use of temporary connections such as boiler outages and system testing during construction would not be covered by the proposal.

C402.1.4.2 Thermal resistance of mechanical equipment penetrations

- To match the intent as described by the Department of Buildings, the word “or” between “through-the-wall mechanical equipment” and “equipment listed in table C403.2.3(3)” should be deleted. Additionally, to facilitate the use of PTACs and PTHPs in affordable housing developments, language such as “or such values as may be demonstrated by analysis or testing and approved by the commissioner or his designee.” should conclude the section.

C402.5.1.3 Air barrier testing

- Item 3 should be clarified to explicitly state that Department of Buildings rules will not have the authority to change the size thresholds noted in Items 1 and 2 without amending the code.

C405.4.2.(2) Interior lighting power allowances: space-by-space method

- The proposed lighting power density reductions for enclosed and open plan offices are significantly lower than the 2016 update to the Conservation Construction Code of New York State Energy. We are concerned that these reductions may be too low to allow for good design without proportionate energy saving benefits.

C408.2.1 Commissioning plan

- The proposed replacement language for Item 2 significantly expands the information that the Department of Buildings must review. Although this language exists in the 2014 New York City Energy Conservation Code, it is unclear what benefit results from the expanded commissioning plans.

C408.2.4.1 Acceptance of report

- REBNY objected to the adoption of this language initially. It is important to note that certain systems covered by this section can only be commissioned depending on the season. We are concerned about the cost and usefulness of reports on systems that are not ready for commissioning created in order to receive a final inspection.

With modification to address the aforementioned concerns, REBNY supports Int. No. 1169-2016 and the City's efforts to update energy use standards. Thank you again for the opportunity to comment. We look forward to continuing our conversations with the Council to continue improving energy efficiency throughout the City for all New Yorkers.

MEMORANDUM OF ANALYSIS

BILL: 1160
SUBJECT: A Local Law to amend the administrative code of the city of New York, in relation to the Installation of sub-meters in certain tenant spaces
SPONSORS: Constantinides, Richards, (in conjunction with the Mayor)

BILL: 1163
SUBJECT: A Local Law to amend the administrative code of the city of New York, in relation to expanding the list of buildings required to be benchmarked for energy and water efficiency
SPONSORS: Daniel R. Garodnick, Donovan J. Richards, Corey D. Johnson, Costa G. Constantinides, Margaret S. Chin, (in conjunction with the Mayor)

DATE: June 22, 2016

REBNY, representing over 17,000 owners, developers, managers and brokers of real property in New York City, supports the effort to reduce our carbon footprint. REBNY's members include national leaders in sustainable development.

Since 2009, buildings of 50,000 SF or greater have been required to perform water and energy efficiency benchmarking, and to sub-meter tenant spaces of 10,000 SF or greater as a result of Local Laws 84 and 88, respectively. In their current forms, almost the entirety of our membership's collective portfolios must comply with Local Laws 84 and 88. **Intro 1163** extends these benchmarking requirements to buildings of 25,000 SF or greater. And **Intro 1160** extends the sub-metering requirements to buildings of 25,000 SF or more with tenant spaces of at least 5,000 SF, or floors of 5,000 SF or more let to two or more tenants. Both of these bills are part of the Administration's larger sustainability efforts to reduce greenhouse gas emissions 80 percent by the year 2050.

It should be noted that the bills seem to go beyond the Administration's goals as articulated in *One City Built to Last*. The report, issued last Earth Day, calls for the sub-metering of only non-residential tenant spaces. While Intro 1160 exempts Class One residential and other real property where the HVAC and heating systems are owned by the dwelling unit owner, all other residential, including multi-family buildings, are covered by the bill.

Accordingly, we offer the following analysis on **Intros 1163** and **1160** to demonstrate the costs implications in complying with these bills.

Water and energy efficiency benchmarking would add annual costs of approximately \$500 to \$2,500 per building report. It should be noted that as more buildings are required to undergo annual benchmarking, private companies offering such services have proliferated. There is now a considerable range of private companies that provide benchmarking services at different price points which in turn, could impact the quality of benchmarking analysis. The reliability of benchmarking data could perhaps be strengthened if utility services would provide annual consumption figures to the consumer and other regulatory agencies provided that appropriate privacy measures are addressed.

Sub-metering tenant spaces requires building-specific design that costs approximately \$0.02 to \$0.03 per square foot, and adds a one-time cost between \$3,000 to \$5,000 per sub-meter with additional on-going costs to maintain and service the sub-meters once installed.

Assume a typical commercial building of 40,000 SF of 10 floors and 14 tenants as example. Because the floorplate is over 5,000 SF but is let to multiple tenants, a sub-meter will be installed for each tenant per Intro 1160. Hence, the upfront costs for this building would be \$42,800. The cost break-down is as follows:

$$\begin{array}{r} \$42,000 \text{ (14 tenants x } \$3,000 \text{ (at minimum))} \\ + \quad \quad \quad \$800 \text{ (} \$.02 \text{ x } 40,000 \text{)} \\ \hline \$42,800 \end{array}$$



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dharris@iccsafe.org
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Honorable Jumaane Williams
Committee on Housing and Buildings
NYC Council
250 Broadway Suite 1754
New York, NY 10007

Dear Chairman Williams:

Please accept the following testimony in support of Int. 1169 which would amend the administrative code of the City of New York, in relation to conforming the New York City Energy Conservation Code to the New York State Energy Code with amendments unique to construction in the City.

As you are aware the NYC and NYS Energy Code is based on the International Energy Conservation Code (IECC), published by the International Code Council (ICC). The ICC, is a member-focused association dedicated to developing model codes and standards used in the design, build and compliance process to construct safe, sustainable, affordable and resilient structures. The IECC is adopted at the state or local level in 48 states, including the District of Columbia, Puerto Rico, the U.S. Virgin Islands, Saudi Arabia and Abu Dhabi. To date, Illinois, Maryland, New Jersey, Vermont, and Washington have adopted the 2015 IECC statewide.

The State Fire Prevention and Building Code Council voted to adopt the 2015 International Energy Conservation Code and ASHRAE 90.1, 2013 along with the rest of the 2015 International Codes (I-Codes). The effective date of these codes will be October 3, 2016. Therefore the City of New York must update its Energy Code so that it continues to stay in compliance with Article 11 of the New York State Energy Law.

The I-Codes, including the IECC are regularly revised and updated by a national consensus process that strikes a balance between the latest technology and new building products, economics and cost while providing for an acceptable level of public and first responder safety. It is an open, inclusive process that encourages input from all individuals and groups and allows those governmental members that are public safety officials to determine the final code provisions. I am pleased that several NYC Department of Buildings, FDNY and other organizations participated in the 2015 ICC Code Hearings. This involvement is critical to the success of 2015 International Codes (I-Codes) as well as each future version. The expertise of New York City officials, design professionals, builders, contractors, labor representatives and all organizations interested in building safety are vital to your adoption efforts as well as ours.

The 2015 International Energy Conservation Codes (IECC) yields positive benefits for U.S. residents and significant energy savings for the nation. According to the Pacific Northwest National Laboratory Report entitled, "Energy and Energy Cost Savings Analysis of the 2015 IECC for Commercial Buildings" issued August 2015, provided an assessment as to whether new buildings constructed to the commercial energy efficiency provisions of the 2015 IECC would save energy and energy costs as compared to the 2012 IECC. PNNL also compared the energy performance of the 2015 IECC with the corresponding Standard 90.1-2013. The purpose of their analysis is to help states and local jurisdictions make informed decisions regarding model code adoption. The report found that "overall, the 2015 edition of the IECC results in site energy savings of 11.5% at the aggregate national level compared to the 2012 IECC edition." The report also noted that 2015 IECC and ASHRAE 90.1-2013, "are within 1% for both energy use and energy cost." The full report can be found at: https://www.energycodes.gov/sites/default/files/documents/2015_IECC_Commercial_Analysis.pdf

Additionally, according to a National Association of Home Builders (NAHB) report dated 3/12/13, revealing what home buyers really want, the “First and foremost” response was, “energy efficiency. Some of the most wanted features involve saving energy, i.e. energy-star rated appliances and windows, and an energy-star rating for the whole home. Nine out of ten buyers would rather buy a home with energy-efficient features and permanently lower utility bills than one without those features that costs 2 percent to 3 percent less.”

Thank you for the opportunity to provide written testimony in support of Int.1169. Please do not hesitate to contact me if I can provide you with any additional documentation.

Sincerely,

A handwritten signature in cursive script that reads "Dorothy M. Harris". The signature is written in black ink and is positioned above the typed name.

Dorothy M. Harris
Vice President, State & Local Government Relations

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1169 Res. No. _____

in favor in opposition

Date: 6/22/2016

(PLEASE PRINT)

Name: Commissioner Rick Chandler

Address: _____

I represent: Dept. of Buildings.

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1163 Res. No. _____

in favor in opposition

w/ suggestions Date: 6/22/16

(PLEASE PRINT)

Name: Dorinda Pollock

Address: 180 RSD

I represent: Jewish Community Relations Council

Address: 225 W 34 St.

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1163 Res. No. _____

in favor in opposition

w/ suggestions Date: 6/22/16

(PLEASE PRINT)

Name: Marcia Eisenberg

Address: 302 W 86 St.

I represent: Jewish Community Relations Council

Address: 225 W 34 St.

**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: Annel Hernandez

Address: _____

I represent: NYC Environmental Justice Alliance

Address: 166A 22nd Street

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1163 Res. No. _____
 in favor in opposition

Date: 6-22-16

(PLEASE PRINT)

Name: Mary Ann Rothman

Address: 110 Riverside Dr. NYC 10024

I represent: Council of NY Cooperatives & Condominiums

Address: 250 W 57 St # 730 NYC 10107

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1163 Res. No. _____
 in favor in opposition

Date: _____

(PLEASE PRINT)

Name: Abby Brown

Address: 257 Park Ave S, 17th Fl, NY, NY 10010

I represent: Environmental Defense Fund

Address: (Same as above)

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. All 19 to July Res. No. _____

in favor in opposition

Date: _____

(PLEASE PRINT)

Name: Alex Gleason

Address: 275 7th Ave 18th Fl. agleason@nyccle.org

I represent: NYC Central Labor Council, AFL-CIO

Address: 275 7th Ave 18th fl. agleason@nyccle.org

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

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

in favor in opposition

Date: 6/22/16

(PLEASE PRINT)

Name: Daniel Harpen, P.E.

Address: 3 Harbor Hill Drive

I represent: Huntton, N.Y. 11745

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1169 Res. No. _____

in favor in opposition

Date: _____

(PLEASE PRINT)

Name: DANIEL H NALL

Address: _____

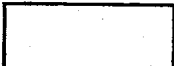
I represent: ACEC, NY

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. 1160 Res. No. _____

in favor in opposition

Date: 6/22/16

Name: Daniel Harper (PLEASE PRINT) PE

Address: 3 Harbor Hill Drive

I represent: _____

Address: 3 Harbor Hill Drive, Huntley, NY 11745

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card



I intend to appear and speak on Int. No. 1163 Res. No. _____

in favor in opposition

Date: 6/22/16

Name: Daniel Kayten (PLEASE PRINT) PE

Address: 3 Harbor Hill Drive

I represent: _____

Address: Huntley, N.Y. 11743

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card



I intend to appear and speak on Int. No. 1160 ^{Emergency} Res. No. _____

1169 in favor in opposition

1163
1165 Date: 6/22/17

Name: Victor Nazario (PLEASE PRINT)

Address: 25 West 18th Street N.Y.

I represent: 32 BJ SEIU

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1160, 1163, 1165, 1169 Res. No. _____

in favor in opposition

Date: 6/27/16

(PLEASE PRINT)

Name: Laurie Kerr
Address: 20 Broad Street #1709 New York, NY 10005

I represent: Urban Green Council

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

I intend to appear and speak on Int. No. 1160, 1163, 1165, 1169 Res. No. _____

in favor in opposition

Date: 6/22/16

(PLEASE PRINT)

Name: JORDAN LEVINE
Address: _____
I represent: THE NEW YORK LEAGUE OF CONSERVATION VOICES

Address: 30 BROAD STREET, 30th FL, NY NY 10004

**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: 6/22/16

(PLEASE PRINT)

Name: Nilda Mesa
Address: Director of MOS

I represent: _____

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. 1163 Res. No. _____

in favor in opposition

Date: 6/22/16

(PLEASE PRINT)

Name: Joseph Rosenberg

Address: 1011 First Ave

I represent: Catholic Community Relations

Address: Council

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

[]

I intend to appear and speak on Int. No. 1160, 1163, 1165, 1169 Res. No. _____

in favor in opposition

Date: 6/22/16

(PLEASE PRINT)

Name: Eric Goshaw

Address: 536 La Guardia Place New York, NY 10012

I represent: American Institute of Architects New York

Address: _____

**THE COUNCIL
THE CITY OF NEW YORK**

Appearance Card

[]

I intend to appear and speak on Int. No. 1163 Res. No. _____

in favor in opposition

Date: _____

(PLEASE PRINT)

Name: FRANK RICCI

Address: _____

I represent: Rent Stabilization Assoc.

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: Josh Kellermann

Address: _____

I represent: ALIGN

Address: 50 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. ^{1160, 1163} 1165, 1169 Res. No. _____

in favor in opposition

Date: 6/22/16

(PLEASE PRINT)

Name: Samantha Wilt

Address: 19 Croton Ave, Hastings on Hudson, NY

I represent: Natural Resources Defense Council

Address: 40 W. 20 St, NYC, NY

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