TESTIMONY OF THE MAYOR'S OFFICE
BEFORE THE NEW YORK CITY COUNCIL
COMMITTEE ON
ENVIRONMENTAL PROTECTION

December 4, 2018

I. INTRODUCTION

Good afternoon. My name is Mark Chambers and I am the Director of the Mayor's Office of Sustainability (MOS). I want to thank Chairperson Constantinides and members of the committee for this opportunity to testify on behalf of the de Blasio Administration on Introduction 1253, mandating reductions in greenhouse gas emissions from large buildings, Introduction 1252, enabling Property Assessed Clean Energy (PACE) financing, and Introduction 1251 related to energy efficient grades for buildings. Last year, Mayor de Blasio called for bold action to require buildings to undergo retrofits to reduce greenhouse gas emissions, improve energy efficiency, and create jobs. These bills are major steps in that direction, and we look forward to working together to ensure we're doing all we can.

As the wildfires in California and recent hurricanes in the Atlantic and Gulf of Mexico emphasize, time is not on our side when it comes to the climate crisis and cutting greenhouse gases (GHGs). Just last month, thirteen United States government agencies warned that the damage from climate change could cut as much as ten percent from the American economy by century's end if significant steps aren't taken to rein in carbon.

Buildings are among the world's – including New York City's – larger sources of carbon emissions, meaning solving our climate crisis has to start in the places where we live, work and play. And while these three bills, which focus on buildings, move our city in the right direction, they are only part of the solution. The Administration, in close partnership with the Council, is intent on cutting GHG emissions from *all* sectors as fast as possible and transitioning to renewable energy and cleaner modes of transportation. This includes doubling down on our commitment to reduce GHG emissions 80 percent by 2050 by aligning our efforts with the Paris Agreement to keep worldwide temperature increase to 1.5 degree Celsius beyond which we risk catastrophe.

There is no time to rest when it comes to climate change. We are constantly asking ourselves, what more can we do? Why, because collectively there is no government, institution or company on earth that is doing enough to address this existential dilemma. Making matters worse, the fossil fuel industry is so rich and powerful, and hydrocarbons so central to our economy, that this battle was always going to be uphill. We know this is a battle that can be won but it can only be won with intense urgency – and we need more of that right now.

So what's the next step? How can we be bolder, how can we be more audacious? The answer partly rests in the future of the bills we are here to discuss today, which are in line with the proposals that Mayor de Blasio put forth September 2017. Because these bills are indicative of the actions cities and states across world need to take to give humanity a fighting chance against climate change.

II. REQUIRING RETROFITS

The Crux of the Problem

It's still not widely understood that when it comes to climate change and carbon pollution in the city, buildings are the number one problem. When we think about pollution, it's understandable that we think about tailpipe exhaust from our cars, but in New York City and in cities across the world it is actually our buildings that are the biggest problem. The

carbon footprint for buildings – which is primarily a product of the energy used to power, heat and cool buildings – accounts for almost 70 percent of New York City's GHG emission.

Here in New York City, more than 100 institutions have committed to voluntarily cutting carbon from their buildings through the City's Carbon Challenge. While these property owners should be applauded for the leadership, many other big building owners have not grasped the urgency of the problem. Simply put, we can't wait for the vast majority of building owners to get off the sidelines. That's why we have to mandate carbon reductions in large buildings now.

Solving the Problem

Introduction 1253 is a practical straightforward approach to reducing GHGs from buildings both public and privately owned. This mandate focuses on buildings larger 25,000 square feet or larger. By 2022, the worst polluting large buildings will be required to cut emissions or face stiff penalties. More stringent targets will be set for 2024 to 2030. In addition, the City is actively working with Con Edison and National Grid to study what additional policies and targets could be phased in for 2030 to 2050. This approach doesn't dictate specific technologies or retrofit pathways, providing building owners the flexibility to choose the upgrades that best suit their buildings and budgets.

The Benefits of Retrofits

If enacted, Introduction 1253 would reduce GHG emissions in large buildings impacted by mandate by 20 percent 2030 and 80 percent by 2050. These emissions reductions will improve local air quality, preventing nearly 90 air-quality related hospitalizations and 35 deaths by per year, keeping us on track towards our goal to have the cleanest air of any big city in America.

As we all know, the climate crisis will hit the disempowered the hardest. But fighting climate change and fighting economic inequality can be two fronts in the same battle. Climate change is an enormous challenge but if addressed meaningfully, it's also an opportunity to provide our residents with lifelong skills they can use for careers that put them solidly in the middle class. This bill will create approximately 14,700 good paying, green jobs like retrofitting windows and building envelopes, installing green energy, and improving the efficiency of our heating and hot water systems. Through Mayor de Blasio's Green Job Corps initiative, the Administration is committed to paying for the training to prepare New York City residents to do this work.

This plan also acknowledges the affordable housing crisis in this city. Large buildings with one or more rent stabilized or income-restricted units account for about half of all GHG emissions from buildings in the city. With this bill, more buildings will now have to conduct energy audits and undertake retro-commissioning to optimize how building equipment and systems function together. When it comes to energy retrofits, tenants should not be unfairly burdened by the cost of necessary building improvements. We look forward to working with the council on ways to encourage emission reductions from these buildings without unnecessarily burdening tenants.

Supporting Building Owners

Undoubtedly there will be resistance to a plan like this; people will lobby hard for the status quo, that's usually what happens when new ideas arise. Case in point is Washington State's November ballot initiative where people tried to take matters into their own hands to cut carbon only to be crushed by the money power of Big Oil. We can't let the deniers and those with deep pockets whose profits are at risk deter us. The clear fact of the matter is that the magnitude of the climate crisis means we have to urgently change the way we live. The science is clear: we have to cut carbon now and cutting it from the largest source make the most sense.

We also have to acknowledge another fact that there are costs to this kind of change; retrofitting buildings will not always be easy or inexpensive. There are building owners with limited means, who genuinely need help making their buildings cleaner to meet the mandate. That's why the Administration is also strongly supportive of Introduction 1252, which enables Property Assessed Clean Energy financing or PACE financing within the city. The city's PACE program

will provide long-term loans at lower interest rates to owners of all building types. PACE loans, which attach to the building, rather than to the owner, require little or no money up-front, and are paid back based on the projected energy savings. This can enable owners to do the necessary retrofits, save them thousands of dollars a year in operating expenses, all without excessively disrupting their cash flow. PACE financing, which is enabled in 36 states and Washington, D.C., is a proven mechanism for improving energy efficiency and expanding clean energy in buildings.

The PACE program will also complement a wide variety of City and State programs *already* in place that offer financial support for building energy efficiency. The Administration is committing $32 million to expand our Retrofit Accelerator to provide free technical assistance to any building larger than 25,000 square feet. The Retrofit Accelerator will grow the market for energy retrofits space through education and training of contractors and trades in order to meet the demands of buildings that need to reduce emissions. But let's remember that every building owner subject to the mandate is getting an upside too: any time you retrofit, you can reduce your energy use and thus your energy bill.

But I want to emphasize that there will be consequences for anyone who ignores this new policy. The Administration supports enforcement to encourage compliance, and intends to work with Council to ensure there are reasonable but consequential penalties to ensure the work is done. Simply put, the cost of inaction will be higher than cost of compliance, and our Department of Buildings stands ready to enforce this mandate.

Mayor de Blasio has long supported a legislative mandate to cut emissions from our largest buildings. Over the coming weeks, the Administration looks forward working the Council and stakeholders to fine tune the bill in a few areas, such as:

- Achieving emission reductions from affordable housing buildings without unnecessarily burdening tenants;
- Ensuring compliance timelines are aggressive yet achievable;
- Structuring penalties in manner consistent with the costs associated with compliance;
- Evaluating portfolio-level emissions targets for public buildings;
- Providing accommodations for critical facilities and commercial tenant and industrial process loads, such as through the purchase of offsets; and
- Making sure that the benefits of clean distributed generation are accounted for properly.

With regard to Introduction 1251, relating to energy efficiency grades in Local Law 33 of 2018, the Administration supports a grading scheme appropriate for New York City buildings. We want building owners to be transparent about their efforts to become more energy efficient.

IV. CONCLUSION

When it comes to climate change, the problems we face are daunting but we actually have more tools at our disposal than we realize. Done right, these bills are powerful tools for our city, and powerful examples for other cities around the country, for cutting carbon from buildings. We look forward to working with the Council on leading the way. Thank you. I am now happy to answer any questions.

TESTIMONY OF CARL HUM, REAL ESTATE BOARD OF NEW YORK
BEFORE THE NEW YORK CITY COUNCIL COMMITTEE ON ENVIRONMENTAL PROTECTION
ON INTRO NO 1253
DECEMBER 4, 2018

Good morning Speaker Johnson, Chair Constantinides and members of the Committee on Environmental Protection. I am Carl Hum, General Counsel and Senior Vice President at the Real Estate Board of NY. Joining me are David Cohen of Local 32BJ SEIU and Donna DeConstanzo of the Natural Resources Defense Council.

We are delivering joint testimony because our organizations collectively recognize the profound societal threat that climate change poses, made abundantly more pressing in light of the recent IPCC report and National Climate Assessment, which show that GHG reductions will need to be closer to 90% by 2050. To that end, our organizations, inspired by the Urban Green 80x50 Buildings Partnership, have been working together to create effective and sensible ways to achieve the GHG reductions to fight climate change, while creating additional significant benefits for New Yorkers.

New York City has among the lowest GHG emissions per capita of large US cities, but buildings – occupants including commercial and residential tenants along with base operations - are responsible for two-thirds of the City's GHG emissions. Therefore, it is critical and logical to focus on reductions from this sector.

Our organizations appreciate the Council's leadership on this issue, and specifically, Chair Constantinides' introduction of such bold legislation to regulate GHG emissions. We support the Council's efforts and look forward to working with you on this legislation and other related initiatives.

Energy efficiency and reducing energy consumption in buildings is the best, fastest, and cheapest way to achieve our greenhouse gas reduction goals, while also creating local jobs, reducing energy costs, decreasing other harmful pollutants, investing in our city, increasing electric grid reliability, and improving our buildings to be better homes and workplaces. Among REBNY's membership are early adopters and innovators of energy efficiency. These include builders of the largest passive house structure and LEED-certified office towers, in addition to the creators of real-time building management systems that have realized 40% reductions in energy consumption across portfolios.

REBNY supports the bill's intention to act quickly and with ambition, but also wants to ensure we proceed wisely - focusing on our long-term goals while being cognizant of our short-term realities. With an aim of reducing GHG emissions 40% below 2005 levels by 2030 and achieving at minimum an 80% reduction by 2050, our organizations jointly offer suggestions to improve the bill.

We appreciate the bill's call for a "carbon trading study" to encourage investment, preserve a minimum level of benefits for all covered buildings, and not result in any localized increases in pollution. Such a program would permit the ability to trade efficiencies among buildings or portfolios, allowing owners to achieve emissions limits or energy performance targets most cost-effectively, without sacrificing the City's GHG reduction goals and the local benefits derived from achieving them. Tokyo's carbon trading program should be referenced as a workable model to explore.

However, we have concerns about the bill's initial compliance period that require absolute GHG reductions by 2022 – 2023. The American Council of Engineering Companies will tell you that the capital improvements needed to meet the bill's initial targets require at minimum two years to be planned, financed, implemented and assessed. In sharing that assessment, we estimate that over 450 million square feet of retrofits would need to be completed during this initial period, overwhelming the available workforce and building owners' ability to successfully implement the required retrofits within that timeframe.

In addition, since LL84 benchmarking data is still being collected for buildings between 25,000 and 50,000 square feet and will not be available until 2019 at the earliest, we believe that imposing requirements for these buildings prior to an appreciation of the benchmarking data is premature.

Moreover, the bill's allotment of GHG/sf targets among five categories of occupancy groups does not take into account the very different types and occupancies of buildings, their societal value or the nuances within individual occupancies such as hours of operations or end-user intensity. For example, grouping Occupancy types "B," "I" and "M" together means that a 24/7 hospital needs to meet the same threshold as a lightly occupied office operating only 40-50 hours per week.

REBNY shares other concerns, in particular, the bill's exclusion of buildings with at least one rent-regulated unit which effectively means that over a third of GHG emissions from buildings over 25,000 sf will not be addressed. This and other concerns will be described by my fellow panelists to whom I now concede the floor and my remaining time.

RENT STABILIZATION ASSOCIATION • 123 William Street • New York, NY 10038

FOR THE RECORD

MEMORANDUM

INTRO. 1253

The Rent Stabilization Association (RSA) represents 25,000 owners and managers of multiple dwellings in New York. The buildings that they own and manage contain over 1 million units of housing. RSA fully supports the intent of Intro 1253 and its goal of reducing greenhouse gases emitted from NYC buildings. However in its current form we cannot support the bill for several reasons.

RSA has been a committed member of the task force convened by the Urban Green 80x50 Buildings Partnership for the last 2 years. Working with environmental groups, energy consultants, energy providers, not for profit operators of buildings, and representatives of other real estate trade associations we have crafted an outline for legislation that achieves the goals everyone wants to see and is doable. Urban Green will submit separate specific comments. As the task force worked through the various issues in Intro. 1253 it was brought to our attention that the metrics used to specify the reductions in energy use are entirely based on benchmarking data derived over the last 5 years. This data was garnered from buildings of 50,000 sf or greater. The proposed bill will apply to buildings with square footage of 25,000 sf or more. There is no data at all for this class of housing and the metrics may be very different given the number of different types of buildings in this size range. At a minimum RSA feels that the metrics for buildings between 25,000 and 50,000 sf be on a different time line than for buildings over 50,000 sf.

Additionally RSA would like to see a simpler definition of the reductions that owners are expected to achieve. The current mandates in the bill are meaningless to the vast majority of owners and managers because they require a calculation that has rarely been required of an owner. I think it's fair to say that virtually every council member that would be asked to vote on this bill could not explain to an owner or manager what the bill requires.

Finally it's clear that the timelines are not realistic. There are not enough consultants, contractors, or time to line up financing for the large number of buildings effected in the timeframe specified.

Testimony by Annie Garneva,
Director of Communications and Member Services of the New York City Employment and Training Coalition (NYCETC) & Member of Sane Energy Project

Before the New York City Council Committee on Environmental Protection
Chairman Costa Constantinides

in support of passage of Int. 1253

December 4, 2018

Good afternoon and thank you for giving members of the public and various impacted communities the opportunity to testify on the importance of legislation that would tackle the twin imperatives that drive our current and near future - climate breakdown and rampant economic inequity.

My name is Annie Garneva, Director of Communications and Member Services of the New York City Employment and Training Coalition (NYCETC). The New York City Employment & Training Coalition (NYCETC) supports the workforce development community to ensure that every New Yorker has access to the skills, training, and education needed to thrive in the local economy, and that every business is able to maintain a highly skilled workforce. With over 150 members, NYCETC works with community-based organizations, educational institutions and labor management organizations engaged in New York City workforce development, to improve policy, practices, and outcomes to achieve economic inclusion for the city's workers, job-seekers and employers. I am also testifying as an active member of Sane Energy Project, a grassroots organization committed to replacing fracked gas infrastructure with community-led, sustainable energy across New York State.

Our city and country are suffering from the interconnected crises of climate breakdown and deepening economic inequity. And yet again, the frontline communities that suffer the most are low income communities and communities of color that have always carried the deepest burdens of the climate and economic crises. These interconnected problems must have interconnected solutions.

Through NYCETC, I understand the negative life-long consequences faced by the 2.1 million New Yorkers who are underemployed or out-of-work and without a clear pathway to a job, career, and self-sufficiency for themselves and their families. This struggle has been exacerbated by under-investments in economic and workforce development programs for all residents, weaking access to economic opportunities for those within our communities that need it most. This is why the NYC Employment and Training Coalition is here today with so many varied voices lending our support to Intro. 1253, which would both drastically decrease climate pollution by setting necessary high energy efficiency standards for our city's large buildings and create thousands of high-quality jobs for local residents.

If enacted and strongly enforced, Intro. 1253 would push a large increase in owners of 50,000 large buildings to look to comprehensively overhaul their buildings and upgrade over the coming decades. Firms that do energy efficiency work from design to renovation to construction will need a lot more staff to be able to enter into and thrive within new markets that they currently don't service because energy efficiency. By shifting energy efficiency from a volunteer practice for building owners and developers to a mandated one, the City will trigger innovation, a more robust labor force and long-term career opportunities within the energy efficiency field.

At minimum, the passage of this bill is projected to create more than 4,000 jobs per year, with potential for more as the energy efficiency sector grows and solidifies itself in a more robust market. Energy efficiency upgrades would create jobs in everything from upgrading building systems (such as HVAC, boiler and radiator controls), weather-stripping, to improved insulation and LED lighting, not to mention renovation and construction. In fact, one 2015 study finds that the implementation of similar energy efficiency mandates between 2015 and 2050, including reaching Zero-Net-Energy by 2030, will create approximately $5.8 billion dollars in construction each year and create 82,780 new jobs annually. These estimates include almost 33,000 construction industry jobs; 26,000 indirect jobs in fields like transportation and administration and 24,000 induced jobs in fields like retail and hospitality.[1]

Not only are these good-quality jobs, with strong middle-class wages and well defined opportunities for advancement, they are also accessible to a variety of communities that have often been excluded from economic growth, including low-income communities and communities of color. These would also be local jobs that cannot be outsourced and, to ensure access to these jobs and a viable workforce, will require targeted investments from the City and employers in quality training programs that build a stronger talent pipeline.

Quality training programs and partnerships between businesses and training providers already exist, and are ready to be scaled up with an infusion of targeted investments and higher demand for services. For example, one of NYCETC's members is Green City Force, a program that trains young adults from low-income communities, including many NYCHA residents, in the

[1] Mazria, Edward. "ACHIEVING 80x50: Reducing Energy Use, Creating Jobs, and Phasing Out Carbon Emissions in New York City's Buildings." Architecture 2030. https://architecture2030.org/achieving-80x50-nyc/

clean energy sector. Most recently, Green City Force and their employer partner Franklin Energy Services won a NYCETC annual award for their collaborative partnership over the last 2 years that has led to the training, hiring and promotion of over 25 young people into not just jobs, but careers. Investment in these kinds of employment and training models are imperative to ensuring that the jobs and economic benefits of Intro. 1253 are accessible to New Yorkers.

Given that this is the first and best legislation of its kind in the world to tackle the energy efficiency of large buildings, this is a vital opportunity for NYC to set the standard for how urban communities can successfully mitigate climate change and income inequality. We urge you to pass Intro. 1253 and prioritize the creation of good jobs that solve the climate crisis.

Thank you for your time and consideration of these matters. We at the Employment and Training Coalition would be happy to answer any questions from the Council to the best of our ability.

Contact:

Annie Garneva
Director of Communications and Member Services
NYC Employment & Training Coalition (NYCETC)
agarneva@nycetc.org
646.866.7098 (o) | 908.578.6013 (m)

Testimony of Con Edison
Before the New York City Council
Committee on Environmental Protection
December 4, 2018

Introduction

Good morning. Thank you, Mr. Chairman, and members of the Committee for the opportunity to provide comments today on Intro 1253.

My name is Jason Litwak and I am the Director of Government Relations for Con Edison. I am joined by my colleague, John Catuogno, Director of Resource Planning and Forecasting for Con Edison.

Our comments today are focused on Con Edison's roles in supporting New York City's greenhouse gas emission reduction goals and how this proposed legislation affects Con Edison's 3.4 million electric, 1.1 million gas, and 1,600 steam customers and the energy infrastructure that supports them.

Sequencing is Essential

Building emissions reduction mandates, like those in this legislation, are essential milestones to meeting the City's goal to reduce by 80% GHG emissions by 2050 (80 x 50). To best meet de-carbonization goals, renewable assets must be developed and made operational. Transmission facilities to deliver green electrons to our customers must be also be built. That way, the infrastructure is there to support new building emissions reduction mandates as they are implemented.

Our customers want clean, safe, reliable power and Con Edison is committed to taking the necessary steps to advance a clean energy future. In September of this year, our affiliate Company, Con Edison Development acquired 980 MW of solar and wind projects - which once the acquisition is complete - will make our parent company, Con Edison, Inc., the second largest solar power provider in North America.

Con Edison asks this Committee and the Council at large for your strong support for the following prerequisite strategies, programs, and investments that will best set the stage for making Intro. 1253 a success.

These include supporting:

- Utility ownership of large scale renewable generation to take advantage of low-cost capital and other business synergies;

- The development of the necessary transmission infrastructure to deliver that renewable energy to New York City;
- Making energy efficiency programs a growing and important part of our core business;
- Smart meter technology and implementation;
- Supporting the development of our Smart Solutions for Natural Gas program and renewable natural gas.
- Finally, we ask for your support to ensure that battery storage, which improves grid resiliency and reliability, is permitted and becomes an integral part of our energy infrastructure.

80 x 50 Support

As mentioned, Con Edison supports 80 x 50 and we consider ourselves an integral part of the solution in reaching this important policy goal.

Nowhere is Con Edison's commitment to reducing GHG emissions in the City more evident than our recent, and unprecedented partnership with the City and National Grid to jointly fund and conduct a study which will identify pathways to achieving the 80 x 50 reductions.

The scope of the study is to develop and assess at least three paths to achieve the 80 x 50 goal. Our expectation is that the study will also identify key regulations, laws, and policies that could be modified or adopted to accelerate progress toward the goals.

The results of the study will be released a year from now, likely after the passage of this bill but before the mandates take effect. In light of this, Con Edison expects the study will help inform and shape future energy use metrics. Those metrics will be created by a task force established by this legislation. Although energy providers are mentioned in this bill as possibly being part of the task force, given our integral role in the New York City's energy landscape and the effect mandates will have on our customers, we request the legislation be amended to guarantee the New York City's energy providers a seat on the task force to provide meaningful input.

Electrification and Customer Cost

We certainly understand the urgency to create policy to move us closer to 80 x 50 as a complement to the anticipated results of the joint study.

We understand that this is not an electrification bill, but we believe that without proper sequencing of underlying strategies, such as more energy efficiency and the development of more renewable electricity resources, the emissions limits mandated by this legislation – or any legislation for that matter - will certainly have the effect of increasing not only buildings' electricity usage but also customer bills and costs.

Increasing electrification is a worthy goal, but one simply does not get the environmental benefits of electrification until the carbon intensity of the energy supply is substantially reduced. To gain the intended GHG reduction benefits of electrification, a greener grid is needed. Despite ongoing efforts, that necessary greener grid does not yet exist.

Requested Exceptions

Finally, and significantly, in its current form, this legislation makes no exceptions for buildings under the exclusive control and use of electric, steam, and gas utilities regulated by the NYS Public Service Commission that are used exclusively for the purpose of generating, storing, transmitting, regulating, and delivering these energy commodities.

For example, as currently drafted this legislation will have the effect of curtailing green energy production by utility companies thereby frustrating its goal of reducing building GHG emissions.

Con Edison operates steam generating plants - some of which produce electricity. These Con Edison facilities are currently subject to the provisions of Intro 1253. The Con Edison steam system – the largest district steam system in the world - provides significant environmental benefits by reducing the need for on-site boilers and chimneys at customer premises and aligns with the spirit of this legislation by avoiding approximately 1 million tons of building CO_2 emissions per year through the use of cogeneration.

Therefore, to allow this legislation to reach its full potential, an exception for these Con Edison steam-generating and other similar Con Edison energy related facilities in this legislation is necessary. We look forward to working with the Committee on addressing this important matter.

Conclusion

Thank you once again for the opportunity to join you here this morning. We look forward to continuing to work hand-in-hand with stakeholders and customers to draw upon the best ideas in the marketplace, implement cost-effective solutions and give customers new ways to better manage their energy use.

We would be happy to answer any questions you may have.

NEW YORK BUILDING CONGRESS

December 4, 2018
Testimony before New York City Council
Committee on Environmental Protection
Re: Intro. 1253

Good morning Chair Constantinides and Committee Members. My name is Justin Pascone, Director of Policy for the New York Building Congress. On behalf of my organization, I would like to express our support for the goals of this legislation and the efforts the City Council has taken to reduce our carbon emissions.

The New York Building Congress has, for almost a hundred years, advocated for investment in infrastructure, pursued job creation and promoted preservation and growth in the New York City area. Our association is made up of nearly 550 organizations comprised of more than 250,000 professionals. Through our members, events and various committees, we seek to address the critical issues of the building industry and consistently promote the economic and social advancement of our city and its residents.

Our members know the outsized role New York's built environment has on the production of carbon. New York Building Congress is aligned with the City's goal of reducing greenhouse gas emissions by at least 80 percent by 2050. New York City was responsible for 52 million metric tons of greenhouse gases in 2016, two-thirds of which came from buildings. While the city is on its way to reducing greenhouse gas emissions, it still has a long way to go.

The Building Congress supports the intentions of this legislation and recognizes that achieving our 80x50 goal requires significant reductions in emissions produced by the city's buildings. We also recognize that there are gaps that exist in the current legislation that should be addressed in order to successfully implement this policy. These include:

- In order to obtain the required 12 months of building carbon emission data needed to demonstrate compliance with the 2022 milestone, all required building alternations and retrofits need to be completed by December 31 of 2021. The thousands of buildings that would need to complete this comprehensive and complicated process should have a longer timeframe.
- The metrics used for measuring building emission intensity and categorizing buildings do not have consensus among industry experts. Legislators should work with the industry and stakeholders to find a set of metrics that are appropriate and contextual so that true carbon reductions can be achieved. The Building Congress and our members would look forward to participating in these discussions.
- While we fully support the need to preserve affordable housing for New Yorkers, the elimination of all rent-regulated/affordable housing from compliance would not support the goal of meaningful carbon reduction from our buildings.

New York City's building industry should serve as a national and international example of combating climate change through our built environment. The Building Congress supports efforts to incentivize energy-efficient and resilient building design and construction, as well as efforts to bring our aging building stock into the 21st century. We look forward to working with the Council to achieve these necessary goals.

Thank you for the time to be heard on this important matter.

MHANY Management Inc.
(A Mutual Housing Organization)
1 Metro Tech Center North 11th Floor
HUD Approved Housing Counseling Agency
Brooklyn, NY, 11201
Ph: 718-246-8080 Fax: 718-246-7938
www.mutualhousingny.org

TESTIMONY BEFORE NEW YORK CITY COUNCIL on INTRO 1253-2018
December 4, 2018
Ismene Speliotis, Executive Director, MHANY Management Inc.

Good morning and thank you for the opportunity to testify in support of Intro 1253- 2018 and an opportunity for New York City to be a leader for Climate Change.

As you know and have heard all morning; we are in the midst of an environmental crisis that must be boldly addressed. Thoughtful, serious, effective proposals for curbing emissions and reducing our carbon footprint will benefit individual residents, building owners, neighbors and neighborhoods, the City overall and will set an example for other large, post-industrial cities with an aging infrastructure to adopt necessary retrofit needs and step up to become "agents of change" that reduce the factors that negatively impact climate change rather than continuing to turn a blind eye to continually destructive climate conditions.

What Intro 1253 offers is a road map for change that focuses on the largest buildings that currently generate some of the most serious pollutants and with explicit programmatic and physical changes will have the greatest positive impact on our environment. The beauty of Intro 1253 is that it offers opportunities to improve our environment while at the same time not breaking the private sector bank, not passing costs on to already struggling low, moderate and middle income residents of New York City and actually providing an opportunity for additional living wage job generation that will train and employee a local workforce to achieve these laudable goals.

THE FACTS:

- this legislation fights climate change, drastically cutting climate pollution in NYC, while creating good jobs
- This bill would require large buildings to upgrade to modern energy efficiency standards. Buildings in NYC account for nearly 70% of climate pollution. Only 5% of the City's building stock- large, often luxury towers- account for nearly half (30%) of NYC buildings pollution.
- It would cut climate pollution from large buildings (25,000' sq and larger) by about 40% by 2030, with cuts in pollution starting in 2022 and achieve 80% pollution cuts by 2050.
- Cutting climate pollution at that speed meets the levels the world's scientists at the UN said are needed to keep the planet from cooking… and New York City from going underwater. It hits the levels of the Paris climate agreement.
- Upgrading energy efficiency like this also creates thousands of good jobs, yearly, especially for communities of color in renovation and construction.
- It also means cleaner air for New Yorkers, which is particularly important for anyone who has respiratory problems, asthma or any other lung condition.
- This is the first and best legislation of its kind in the world. That's great, because New York City should lead. We aren't just the world's most important city, which influences what other cities do. New York City also has so much at stake because if we don't act, the climate crisis will drown our city in the coming decades.

I would also urge City Council and the New York City Mayor's Office not to rest on their laurels. Intro. 1253 represents an incredible opportunity to slash emissions from our largest and most-polluting buildings. It is a good and extremely important step.

But New York City has set laudable goals to reduce its greenhouse gas emissions 80% by 2050 and to do its part under the Paris Climate Agreement to limit global warming to 1.5° Celsius. These goals will not be achievable without significant additional carbon emissions reductions in the coming years, and much of the additional reduction will need to come from the City's building stock. Our City's legislative and executive branches will need to continue to identify potential emissions reductions and act to require or incentivize emissions reductions.

Moreover, there remain significant additional opportunities to slash buildings emissions, and I would encourage the groups in this room to continue their work to identify such opportunities, to explore potential paths forward and to build consensus around climate solutions that work for all New Yorkers.

In short, my organization supports Intro. 1253 both for its projected impact on buildings emissions and for the consensus around buildings emissions reductions that it represents.

Thank you.

For more information, please contact NYCCAA Executive Director Amy Turner at amy@nycclimateaction.org or (646) 504-4623.

BIT BUILDING

A Program of Southface

BIT Building Information Sheet

What Is BIT Building?

BIT Building was created by a group of real estate and facility management professionals seeking to develop a building performance improvement program for existing buildings that would enable all types of property owners and operators to understand and adopt high-performance best practices.

The program presents a set of cost-effective industry standards that may be implemented in commercial, institutional and multifamily building types, regardless of current performance. BIT Building is practical and effective, enabling building operators to participate on their own schedules and within their own budgets to achieve third-party recognition for their improvements.

How Does It Work?

You and your building are at the forefront of BIT Building. You may have a business to manage, multiple responsibilities to fulfill or several other properties to maintain, and BIT Building is designed for you and your success. The program contains 16 industry best practices, structured for you to undertake on your schedule and within your budget.

For each best practice, BIT Building gives you tools and resources for implementation, as well as connection to other people pursuing the same best practice. As you implement the best practices, you should see consistent improvements in your building's performance, reductions in resource use and operating expenses, and improvements in productivity and occupant wellbeing. Better buildings and people, bit by bit.

How Much Does It Cost?

BIT Building is designed to be affordable for you and your organization. The annual subscription fee is designed for discretionary budgets, and volume discounts apply. The more buildings you enter, the better the rate! Rates are also specific to an organization's legal structure.

DISCOUNT FOR NUMBER OF BUILDINGS

	0	10%	15%	20%	25%
	1-10	11-20	21-20	31-50	>50
BUILDING TYPE	*SUBSCRIPTION FEE PER BUILDING PER YEAR*				
Private for profit	$500	$450	$425	$400	$375
Government	$400	$360	$340	$320	$300
Governmental authority Education	$350	$315	$298	$280	$263
Not for profit BitUser access only	$125	$113	$105	$100	$95

Rates are subject to change. Check Bitbuilding.org for current rates.

For more information and to register, visit www.bitbuilding.org

BIT BUILDING

A Program of Southface

BIT Building Information Sheet

What Does BIT Building Provide?

BIT Building is designed to empower facilities staff to improve building performance while increasing their career skills:

- Affordable annual subscription
- Digital program participation
- Access to experts to support compliance paths
- Performance approach to operations and maintenance (O+M)
- Opportunity for peer-to-peer networking
- Self-paced approach to performance improvements
- A single place to learn about data-proven best practices and track their impacts
- Consistency in property management across portfolios
- Reduced operating costs and increased ROI for owners/investors
- Easy integration into corporate reporting
- Compatibility within discretionary/operating budgets
- A building baseline to measure and manage rent increases and long-term value, creating more predictable budgets and expenses
- Development of best-in-class facilities management knowledge and skills

Who Is Southface?

Southface, a nonprofit organization, has promoted sustainable homes, workplaces and communities through education, research, advocacy and technical assistance since 1978. Southface continues to be a leader in sustainability throughout the Southeast.

Each day, Southface staff and board work toward a more regenerative future by educating people about resource-conscious lifestyles, researching cutting-edge technologies, advocating for clean forms of energy and engaging in projects to improve efficiency of the built environment. For more information visit southface.org.

Enroll

Provide basic building information and pay a small annual enrollment fee

Implement

Implement 16 proven best practices

Improve

Track and improve energy, water & waste performance from your own historic baseline

Achieve

Receive third-party achievement designations for significant improvement

Testimony of Elizabeth D. Kelly
Manger of Sustainability Programs
The Community Preservation Corporation

Hearing before the New York City Council Committee
in Relation to Establishing a Sustainable Energy Loan Program
December 4, 2018

Good morning. Thank you Councilmember Constantinides, Speaker Johnson, and other distinguished members of the New York City Council. My name is Elizabeth Kelly and I am the Manager of Sustainability Programs at the Community Preservation Corporation (CPC), a nonprofit affordable housing and community revitalization company. CPC was formed in 1974 to help New York City restore and rebuild communities that had been devastated by deterioration and abandonment. Today we help neighborhoods across the state meet their housing and revitalization challenges. Since our founding, we have financed over 193,000 units of affordable housing and invested more than $10 billion in communities around the state to support more equitable and sustainable neighborhoods.

CPC believes the cost savings associated with energy efficiency and clean energy investments are critical to the long-term financial stability of multifamily properties and the preservation of housing affordability. In my role, I work with affordable housing stakeholders to bring creative, private sector solutions to the industry, and catalyze energy efficiency and clean energy projects. CPC is committed to supporting private sector solutions that advance the adoption of sustainable housing. Since 2015, we have deployed almost $600 million of private capital to fund energy retrofits, substantial renovations, and clean energy projects.

I appreciate the opportunity to testify in support of the proposed legislation authorizing the establishment of a sustainable energy loan program or Property Assessed Clean Energy (PACE) financing in New York City. The City's goal to reduce carbon emissions by 80 percent by 2050 is critical for the continued success of our city, our country, and our environment. To aid the Administration's goals, CPC has focused on supporting renewable and efficiency investments as part of first mortgage financing. However, in order to scale sustainability, New York City needs additional financing resources that account for the diversity of our building stock, and its financing needs throughout a building's lifecycle.

PACE offers New York City a straightforward and reliable source of capital to finance renewable energy systems and energy efficiency improvements, as well as related reports and verification. While CPC has promoted these investments in conjunction with mortgage financing, PACE offers the ability to finance such investments as opportunities arise, throughout all stages of the capital cycle.

PACE's voluntary financing enables building improvements that generate utility savings to be funded by private capital and repaid through the building's property tax bill. As PACE

assessments are non-accelerating and remain with the building upon sale, they provide a pathway for owners to opt-in to finance improvements at any time of a building's life or capital cycle. Furthermore, PACE's low-cost financing fills a critical funding gap for affordable housing buildings with limited cash flow and provides a solution for small buildings that traditionally lack access to private capital solutions.

PACE is a proven solution which has received bipartisan support in a diverse set of municipalities across the country. In addition, property assessments for the public good, as provided for in the legislation, is a model which has previously succeeded to fund health and safety initiatives and economic development throughout the city.

Ultimately, PACE financing provides our city's real estate owners with a mechanism to more easily invest in improvements to curb carbon emissions. Given the crucial role buildings will play in achieving the Administration's emission reduction goals, the City must provide building owners with a diverse set of tools to enable them to invest in energy efficiency as simply and easily as possible. CPC encourages the Council to support this legislation.

Thank you.

###

New York City Environmental Justice Alliance
166A 22nd Street, Brooklyn, NY 11232 | www.NYC-EJA.org

On the ground – and at the table

New York City Environmental Justice Alliance testimony to the New York City Council Committee on Environmental Protection in support of Intro. 1253 in relation to reducing greenhouse gas emissions by through an energy efficiency mandate.

December 4, 2018

Good morning Chairperson Costa and Members of the City Council. My name is Annel Hernandez and I am here to testify on behalf of the New York City Environmental Justice Alliance (NYC-EJA) in support of Intro. 1253 in relation to reducing greenhouse gas emissions through an energy efficiency mandate. 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 members 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 communities of color to thrive, and coordinate campaigns designed to affect City and State policies including energy policies affecting 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 of clean energy targets. NYC-EJA also co-founded the Climate Works for All coalition with Align and the NYC Central Labor Council with the goal of reducing emissions, creating good jobs, and protecting environmental justice communities. Our coalition knows that no sector or industry is more critical than the building sector if New York City is going to hit its stated goal of reducing emissions 80% by the year 2050.

As we take bolder steps to reduce our carbon footprint, the City should guarantee protections for low-income neighborhoods and communities of color. Although improved energy efficiency can potentially reduce the energy burden and increase affordability for low-income tenants, the investment in building retrofits may be used as a justification to drive up rental costs for rent-regulated tenants. We are encouraged that Intro. 1253 also takes key steps toward acknowledging the importance of New York City's rent-regulated housing, by providing a separate compliance mechanism for these buildings which will prevent owners from using MCIs to potentially displace tenants. Low-income New Yorkers should be able to access the benefits of clean energy without the threat of gentrification and displacement. We also hope that State government adopts model rules for protecting tenants from rent increases and evictions, preventing the deregulation of apartments, as they relate to investments in energy efficiency, as well as other much needed updates. We also have concerns around the energy efficiency trading scheme, as market based strategies have had negative impacts on environmental justice communities.

Low-income communities and communities of color also face disproportionate climate risks, many of which could be ameliorated through equitable energy policies and strategic investments. For example, NYC's twelve most heat vulnerable neighborhoods are predominantly high-poverty areas where residents are majority people of color. The confluence of extreme heat and lack of access to energy efficient buildings is a quiet threat facing low-income people, people of color, and the elderly. In New York City, 36 percent of

low-to-moderate income households are energy burdened, paying a much higher proportion of their income on energy costs. During heat waves, citywide use of air-conditioning strains the grid, increasing the likelihood of blackouts and brownouts. For heat-vulnerable residents living in energy inefficient homes, lack of power during a heat wave increases risks of dangerous heat exposure.

NYC-EJA commends the New York City Council for holding a hearing on this transformative energy efficiency legislation. 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 while optimizing economic, housing, health, and environmental benefits for the most burdened and climate vulnerable New Yorkers.

Testimony of Catherine McVay Hughes before the
The New York City Council Committee on Environmental Protection
Oversight Hearing: Int 1251-2018, Int 1252-2018, Int 1253-2018
Commitment to Achieve Phased-In Reductions in Greenhouse Gas Emissions by 2050
Tuesday, December 4, 2018 10:00AM — City Hall, Committee Room

Good morning, Chair Constantinides and Council Members Espinal, Levin, Menchaca, Richards, Ulrich and Yeger. Thank you for the opportunity to testify. My name is Catherine McVay Hughes. I served 20 years on Manhattan Community Board One, half that time as Chair or Vice-Chair. After Superstorm Sandy, I was appointed Co-chair of the NY Rising Community Reconstruction Program for Southern Manhattan. Today I am representing the **Financial District Neighborhood Association.** The Financial District is home to roughly 50,000 residents and the fourth largest business district in the country -- and one out of every 18 jobs citywide is located here.

After the sixth anniversary of Superstorm Sandy, we remember its devastating impact on NYC which has over 500 miles of shoreline. Sandy caused 48 deaths in New York mostly due to drowning. Sandy also did an estimated $71 billion in economic damage in the NY-NJ region, with $19 billion in losses to NYC. While the storm's immediate impact lasted only weeks, major infrastructure systems, including mass transit and electrical and telecommunications systems, sustained lasting damage, some of which is still not repaired.

Resiliency in the face of climate change can be achieved by a multi-prong strategy including decreasing greenhouse gases emissions (GHGs) by increasing energy efficiency and transitioning to renewable fuels from carbon-based. We support the following bills with caveats:

- **Int 1251-2018**[i]: A Local Law to amend the administrative code of the city of New York, in relation to a **building energy efficiency grade**[ii]
- **Int 1252-2018**[iii]: A Local Law to amend the administrative code of the city of New York, in relation to establishing a **sustainable energy loan program** -- for the purposes of providing certain building owners with funding for the installation of renewable energy systems or energy efficiency improvements.
    - § 11-3006 **Reporting** should also include an annual deadline when results of performance of renewable energy systems and energy efficiency improvements financed are shared so that best practices can be shared publicly.
- **Int 1253-2018**[iv]: A Local Law to amend the New York city charter and the administrative code of the city of New York, in relation to the **commitment to achieve certain reductions in greenhouse gas emissions by 2050**. This bill would establish the Office of Building Energy Performance, as well as greenhouse gas emissions limits for existing buildings and expand existing retro-commissioning requirements to certain buildings over 25,000 square feet.
    - § 28-320.1 Definitions: **FOSSIL FUEL** currently only "means a fuel such as coal or gas", but it should also include No. 2, No. 4 and No. 6 Heating Oil. How are buildings that use steam generated by Con Edison classified?

A recent article[v] highlights how real estate can be managed efficiently and reduce GHGs and save money through smart tech implementation. For example, since 2005, Rudin Management has reduced its GHG by more than 200,000 metric tons of carbon dioxide equivalent, the equivalent of taking 38,465 cars off the road and translates to an estimated $19.4 million in energy cost savings across its commercial portfolio overall.

The need to act now to reduce GHGs was confirmed by the release of two recent reports:

1. **Fourth National Climate Assessment**[vi] – a major scientific report issued by 13 Federal agencies. This report addresses Impacts, Risk and Adaptation, including what measures can be taken to try to curtail human activities that contribute to global warming (November 23, 2018)
2. **Global Warming of 1.5°C, an IPCC special report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty**[vii] – The Intergovernmental Panel on Climate Change (IPCC) states that "limiting global warming to 1.5ºC would require rapid, far reaching and unprecedented changes in all aspects of society, with clear benefits to people and natural ecosystems, limiting global warming to 1.5ºC compared to 2ºC could go hand in hand with ensuring a more sustainable and equitable society." In addition, "One of the key messages that comes out very strongly from this report is that we are already seeing the consequences of 1°C of global warming through more extreme weather, rising sea levels and diminishing Arctic sea ice, among other changes." "The **IPCC stated that to keep to the 1.5C goal, governments would have to slash emissions of greenhouse gases by 45% by 2030.**"[viii]

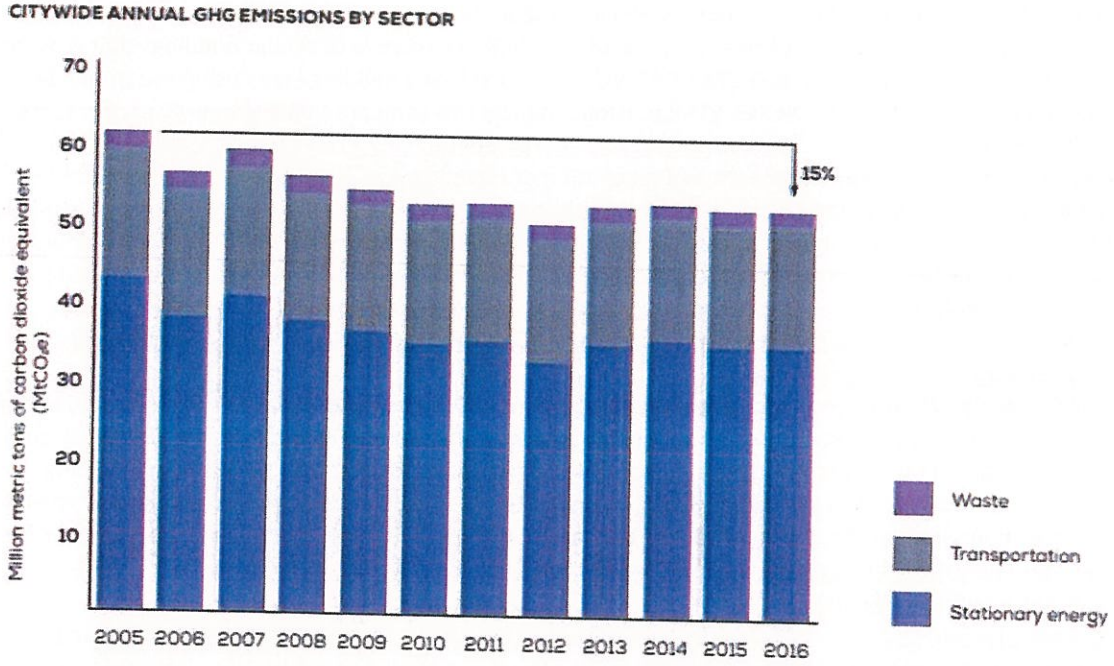
Right now the COP24 (the informal name for the 24th Conference of the Parties to the United Nations Framework Convention on Climate Change) are meeting in Poland. They say, "decisive action in the next two years will be crucial" and "any delay will only make it harder and more expensive to respond to climate change."[ix]

In conclusion, Sandy taught us the importance of preparation and the necessity of investing in rapidly reducing GHGs to prevail in the worst potential impacts of climate change. A few things to remember:

1. **The future of the National Flood Insurance Program (NFIP) continues to be uncertain and has just been extended for one week and is due to expire shortly this Friday, December 7, 2018**[x]. "If the NFIP expires, the residential housing market in at-risk areas could effectively grind to a halt, as potential buyers would no longer be able to obtain the insurance required by the banks responsible for issuing mortgages to these individuals....The NFIP is USD 20 billion in debt, even after Congress forgave USD 16 billion in November 2017. Additional claims this year from hurricanes Florence and Michael will only serve to deepen the hole the NFIP finds itself in"[xi]. We do not know if or how much the federal government will assist in rebuilding our communities after the next Superstorm Sandy.
2. **Moody's, a major credit rating agency, added climate to credit risks and warns cities to address their climate exposure or face rating downgrades.** In addition, **S&P ratings incorporate Environmental Sustainable Governance Guidelines (ESG) and Climate to the extent that it affects an entity's ability to pay its debt.** Cities that suffer downgrades will not be able to make the investments they need, including the investments required to adapt to climate change and to recover from future storms.
3. **Waterfront of Financial District and the South Street Seaport continues to be as exposed** as at Superstorm Sandy over six years ago. The City's Lower Manhattan Coastal Resiliency (LMCR) Project has funding shortfalls for the entire segment south of Brooklyn Bridge and has only provided plans for Interim Flood Protection Measures (IFPM) for the South Street Seaport which will not be implemented until after the 2019 hurricane season[xii]. Also, the U.S. Army Corps of Engineers (USACE) is only at the beginning of a long process in its evaluation of a Regional Storm Surge Barrier. A recent article reported that "Downtown Landlords and Business Leaders Worry About the Next Big Storm."[xiii]
4. **Energy Efficiency and Energy Independence are also a Homeland Security Issue.**

Supporting Data for Testimony of Catherine McVay Hughes

In September 2014, New York City committed to reduce greenhouse gas (GHG) emissions by at least 80 percent by 2050 (80 x 50, Local Law 66 of 2014), with an interim target to reduce emissions 40 percent by 2030 (40 x 30). The graph below shows that since 2005, NYC has reduced Citywide Annual Greenhouse Gas Emissions (GHGs) by 15% in 11 years. However, GHG emissions dropped the most by 2012 and rebounded after that, instead of following the downward trend. NYC committed itself to reduce GHG emissions by at least another 25% within the next 11 years. Can the City keep this promise? And how? Most of NYC's GHGs come from two sources: buildings (67%) and transportation (30%). Therefore, this package of energy efficient building legislation is more important than ever to meeting the City's target.



Source: 1.5°C: Aligning New York City with the Paris Climate Agreement, September 2017, p. 43

Following up on one item from my April 12, 2018 and October 22, 2018 testimonies:

Mayor's Management Report (MMR)[xiv] – the City must track the financial cost of climate change and add indicators to capture sea level rise, energy use and greenhouse gas emissions. The now 450-page September 2018 MMR which increased from its 372-page Preliminary 2018 MMR annual report released in February 2018 continues to fail to report on the City's targets and goals to meet its C40 Commitment by 2020 and its "80 by 2050" target. Since the MMR also reflects the City's values and priorities, this document needs to be updated to include indexes that are annually measured and publicly shared, so that progress can be monitored and evaluated going forward. Also, Local Law 22 of 2008 requires a 30 percent reduction in citywide greenhouse gas emissions by 2030 and requires annual inventory and analysis of greenhouse gas emissions no later than every September 7th and to post on the City's website a report regarding actions taken. Where is that 2017 data?

Affiliations (for purposes of disclosure): Catherine McVay Hughes is a member of the Board of the Battery Park City Authority, Earth Institute at Columbia University Advisory Board, CERES Presidents Council, Lower Manhattan Development Corporation, The Trust for Governors Island, South Street Seaport Museum, WTC Scientific Technical Advisory Committee, Princeton Climate Analytics and Storm Surge Working Group. She holds an MBA from the Wharton School of Business and a Bachelor of Science degree in Civil Engineering from Princeton University.

---

[i] This bill would update the ranges for energy efficiency grades; If such score is equal to or greater than [90] 85 the energy efficiency grade shall be A; equal to or greater than [50] 70 but less than [90] 85, the energy efficiency grade shall be B; equal to or greater than [20] 55 but less than [50] 70, the energy efficiency grade shall be C; less than [20] 55, the energy efficiency grade shall be D; non-compliance, the energy efficiency grade shall be F; https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3761080&GUID=19EFEA3A-ADFE-47E5-94E9-6F8DA9EF8B3E&Options=&Search=

[ii] "**ENERGY EFFICIENCY SCORE**. The term "energy efficiency score" means, for a building, the Energy Star rating for such building or a score that assesses the energy use of such building relative to similar buildings that is assigned through the benchmarking tool. ENERGY STAR RATING. The rating that a building earns using the United States Environmental Protection Agency ENERGY STAR portfolio manager to compare building energy performance to similar buildings in similar climates." https://www1.nyc.gov/assets/buildings/local_laws/ll33of2018.pdf

[iii] ""**Energy efficiency improvement**" means any renovation or retrofitting of a building to reduce energy consumption, such as window and door replacement, lighting, caulking, weatherstripping, air sealing, insulation, and heating and cooling system upgrades, and similar improvements, determined to be cost-effective pursuant to criteria established by the authority. However, "energy efficiency improvement" shall not include lighting measures or household appliances that are not permanently fixed to real property." https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3761079&GUID=6D07BB04-3355-4C2F-AC39-07C636842490&Options=&Search=

[iv] "**BUILDING EMISSIONS.** The term "building emissions" means greenhouse gas emissions as expressed in metric tons of carbon dioxide equivalent emitted as a result of operating a covered building and calculated in accordance with rules promulgated by the administering agency. **BUILDING EMISSION INTENSITY**. The term "building emissions intensity" means, for a covered building, the number obtained by dividing the building emissions by such building's gross floor area, expressed in metric tons of carbon dioxide equivalent per square foot per year." https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3761078&GUID=B938F26C-E9B9-4B9F-B981-1BB2BB52A486&Options=&Search=

[v] https://www.cpexecutive.com/post/rudin-reduces-ghg-emissions-through-smart-tech-implementation/

[vi] https://www.globalchange.gov/nca4

[vii] https://www.ipcc.ch/report/sr15/

[viii] https://www.bbc.com/news/science-environment-46398057#

[ix] https://www.bbc.com/news/science-environment-46398057#

[x] https://www.businessinsurance.com/article/20181130/NEWS06/912325387/Congress-adopts-7-day-extension-for-National-Flood-Insurance-Program

[xi] https://www.air-worldwide.com/Blog/What-Happens-if-the-NFIP-Does-Not-Get-Another-Extension-/?utm_source=Eloqua&utm_medium=email&utm_campaign=blog-notification

[xii] https://www1.nyc.gov/assets/lmcr/downloads/pdf/LMCRCB1Briefing4.17.184PM.PDF

[xiii] Commercial Observer, 11/29/2018; https://commercialobserver.com/2018/11/downtown-landlords-and-business-leaders-worry-about-the-next-big-storm/?fbclid=IwAR3Zlue_OxDGxumEXEwA9TgXSjSbhik5zVYqcxltO5nG5Bf-SxzG3uBGH5I#.XAFQW81pu8c.facebook

[xiv] MMR is mandated by the City Charter, serves as a public account of the performance of City agencies, measuring whether they are delivering services efficiently, effectively and expeditiously, https://www1.nyc.gov/assets/operations/downloads/pdf/mmr2018/2018_mmr.pdf

FOR THE RECORD

Comments from the Building Owners and Managers Association of Greater New York on Int. No. 1253-2018, in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2050, and Int. No 1251-2018, in relation to a building energy efficiency grade

The Building Owners and Managers Association of Greater New York (BOMA/NY) appreciates this opportunity to submit the below comments for the record. We look forward to working with Council Members and Council staff on this proposed legislation.

BOMA/NY represents more than 750 property owners, managers, and building professionals who own or manage 400 million square feet of commercial space in New York City. We are an association within BOMA International, a federation of 90 US associations and 19 international affiliates that own and operate approximately 10.5 billion square feet of office space in the United States.

Int. No. 1253:
Int. No. 1253 seeks to set a schedule to reduce emissions from buildings by 80% by 2050. While BOMA/NY applauds and supports this goal, the bill itself carries a number of major flaws that need to be addressed.

The bill establishes a new Office of Building Energy Performance and an Advisory Board that are tasked to develop proper metrics and methodologies, create policies, set emissions limits, and evaluate costs and benefits, among other critical tasks. Without undertaking these vital studies, there is no fair or proper way to determine, measure, or meet emissions reductions. But instead of waiting for the findings of these bodies, the draft bill sets specific reductions in the very near term, for 2022 and 2023. Starting in 2024, the bill lays out a new emissions limit to go into effect or else will shift to the approach developed by the Advisory Board.

This approach creates numerous problems and should be abandoned. First, it really makes little sense to have one policy approach for two years, then likely a completely different one after that. Second, the use of energy intensity, or energy per square foot, is fully inappropriate. Tenants drive energy use in buildings through hours of operation, comfort needs, plug loads, and number of people, among other factors. Many tenants in large commercial buildings operate businesses such as hedge funds, law firms, and trading floors, that require and consume large amounts of energy. Much of the energy they use is electricity from the grid. A building owner has no real control over tenant energy use or electricity generation supplying the grid. In addition, this approach penalizes densely populated buildings, which might use more energy in total but use less energy than if that population were spread out over a larger area.

One Penn Plaza, Suite 2205 . New York, New York 10119 . Phone: (212) 239-3662 . EFax: (646) 706-0503 . Website: www.bomany.org

A Fourth issue is that, as of now, it is unclear exactly how energy use converts to emissions in New York City, as there are no listed carbon conversion factors on electric (kwh), gas (therms), or steam (mlbs). The Advisory Board is tasked with setting these conversion factors, which will take some time. Finally, for buildings with emissions over the threshold, it will be very difficult to meet the proposed law's 2022 timeframe. For these reasons, we need the Advisory Board to work out the proper metrics, methodologies, schedules, and other items prior to setting emissions limits.

The draft bill allows the Advisory Board to investigate a "trading mechanism" as a means to reduce emissions, which is further spelled out in 28-320.7.11[1]. This is almost certainly the best way to reduce emissions in New York City. Large cities are inherently relatively efficient, so reducing emissions in cities can be hard and will be expensive. There are, however, some buildings stocks that it would be relatively cheap to remove significant amounts of emissions from, although these buildings can be financially challenged and unable to take advantage of even the low-hanging fruit. One example is NYCHA housing, which needs billions of dollars to improve efficiency. Instead of fining buildings and having that money disappear into the general fund, we need a mechanism whereby building owners could pay directly for easy, cheap, and much-needed emissions reduction projects at NYCHA housing (and other building types excluded from the bill, as appropriate), instead of taking on expensive, even impossible, energy efficiency projects in their own buildings.

As the bill is currently written, over half of NYC buildings would not be included in the law, meaning that the 80% reductions would have to come from about 40% of buildings. It is extremely unlikely that such a result can be reached, and if it can, it will be at a tremendous cost. We need to include as much of the building stock as is possible so that we can get at more opportunities to reduce emissions where it is easiest and cheapest to do so.

Much of the emissions reductions will have to come from cleaner electricity generation, especially electricity on the grid. As emissions limits drop, buildings may well electrify more building systems, such as heating equipment. However, as stated, building owners have little control over grid electricity generation. This matters in several ways. First, if the grid doesn't "green" as fast is we need, buildings will be stymied and will not be able to meet future emissions limits. The bill should include language tying emissions reductions requirements to the availability of carbon-free or low-carbon emissions. Second, as the New York Energy Consumers Council shows, electrification will mean that the amount of electricity used in general and at peak times will increase significantly, and peak use with shift from summer to

[1] Section 28-320.2.2 states that working groups, subsets of the advisory board, will produce reports on different issues, including on "an approach for a trading mechanism as described in section 28-320.11." The reference to 28-320.11 should be to 28-320.7.11.

winter. This will lead to a need for considerable new infrastructure, which in turn will raise electricity costs for all electricity consumers.

The penalties for not achieving emissions limits are entirely too steep. Larger buildings could face annual fines from over half-a-million dollars to well over one million dollars. Smaller buildings with less capital could easily face fines beyond their means to pay. Fines need to be reduced from their current levels, and a way needs to be established to ensure that the money collected only goes to emissions reduction projects. Again, the "trading mechanism" approach described above, or one similar to it, could price costs based on actual energy efficiency projects and could make sure money is spent to solve emissions problems.

Int. No. 1251:

Int. No. 1251 revises recently passed legislation that requires building owners to post grades in their lobby based on their Energy Star score. This proposed bill would change the range of Energy Star scores that would corelate with each letter grade. The minimum score for an "A" would drop slightly, while the minimum score for the other grades would go up.

BOMA/NY opposed the original bill, because it will be confusing to tenants and others who might see it, and because tenant energy use, over which buildings have little control, significantly influences your Energy Star score. We would oppose this bill on the same grounds.

In addition, EPA recently recalibrated their Energy Star model, as a result of which many buildings' Energy Star score dropped significantly. The largest score drops seemed to have occurred in New York City and Boston. It appears that very large buildings using district steam, which describes most BOMA/NY buildings, seem to have been inordinately impacted. We and our allies have submitted comments on these issues to EPA as part of their follow-up work evaluating the new scoring system, and we are scheduled met with them on December 30th to further discuss matters. At the very least, we would ask for a delay in implementing any letter grade requirement until these issues are resolved and if such resolution creates a fair scoring system for New York City Buildings.

Thank you for accepting this testimony.

ASSOCIATION FOR
ENERGY AFFORDABILITY INC

105 Bruckner Boulevard New York, NY 10454 • Phone: 718.292.6733 • Fax: 718.292.7711

FOR THE RECORD

COMMENTS TO THE NEW YORK CITY COUNCIL
ENVIRONMENTAL PROTECTION COMMITTEE
ON BILL INTRODUCTION 1253-2018:
COMMITMENT TO ACHIEVE CERTAIN REDUCTIONS IN GREENHOUSE GAS EMISSIONS BY 2050
Submitted December 4, 2018

The Association for Energy Affordability (AEA) offers these brief comments on Introduction 1253, whose laudable goals we fully support. AEA is a nonprofit organization dedicated to achieving energy efficiency in new and existing buildings to foster and maintain affordable, healthy housing and communities. AEA engages in a broad range of educational, technical, and construction management activities and services to support this mission. AEA works with building owners and managers, especially those providing affordable and supportive housing, to save energy to improve occupant health and comfort, manage operating costs, and keep rents affordable.

AEA has been actively engaged with other stakeholders and New York City on the issues of energy efficiency and building energy use mandates. In accordance with our mission, we are committed to energy efficiency and affordability – of both utility bills and housing, which are inextricably linked. Meeting the city's laudable and necessary climate action goals, and increasing the health, safety and comfort of our buildings, necessitates a significant increase in building efficiency. However, we also feel strongly that the financial investments needed to achieve these goals should not adversely impact housing affordability and our most vulnerable populations through rent increases.

AEA very much appreciates the hard work of the Council, Council staff and stakeholders in crafting a bill that attempts to increase building efficiency while protecting affordable housing. We do, however, respectfully suggest the bill be revised to make it more robust and to ensure all buildings, including rent regulated housing, are addressed.

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

AEA suggests the following revisions:

1) Move from an exemption for rent regulated housing within the definition of covered buildings to a deferred coverage approach. Including rent regulated housing but with caveats on how and when they will be required to comply will enable these buildings to be easily covered by the mandate once processes and financial incentives to ensure costs are not passed on to renters have been addressed, which they must be. While such a deferral is necessary in the short term, we must ensure the building efficiency of rent regulated housing improves substantially and to the same level as non-regulated housing or we will simply be perpetuating inferior housing for lower income households. A better approach would be to require certain measures, such as those identified in the Urban Green 80x50 Building Partnership recommendations, that do not trigger MCI, and providing for the full mandate to apply when the Advisory Board deems it is appropriate and feasible to do so and still protect tenants (for example, through financial support and/or changes in MCI provisions).

2) Ensure that any alternative compliance option involving purchases of green energy come from truly incremental and sustainable sources that contribute to New York's climate goals. Green energy purchases as an alternative compliance option should be restricted to those technologies eligible under New York's Clean Energy Standard and to generators located in New York. We note, however, that green power purchases do not help make housing healthier, safer or more comfortable and, furthermore, may not improve air quality in New York City.

3) Undertake further review and adopt changes to the variances included in the bill since the current language is vague and provides too much discretion. The variance provisions are vague, which could lead, perhaps inadvertently, to buildings being arbitrarily and inappropriately excused from compliance. Financial hardship variances should require clear and detailed information and strict standards of proof.

4) Change the Energy Auditor requirements to reference and be identical to those used for Local Law 87 compliance. New York City has in place requirements for energy

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

auditors and the use of different standards for different programs would be confusing and in appropriate. Furthermore, we believe the requirements for energy auditors under Local Law 87 are more appropriate than those proposed here, which require the audit to be conducted by a design professional, potentially with additional certifications.

We thank you for the opportunity to comment on this important initiative, and we would be happy to discuss our recommendations at any time.

Respectfully submitted,

David Hepinstall
Executive Director

Valerie Strauss
Director of Policy & Regulatory Affairs

National Grid Statement
On
New York City's Proposal to Reduce Greenhouse Gas Emissions

McKenzie Schwartz, Climate Change Compliance Analyst
December 4, 2018

Good afternoon. My name is McKenzie (Kenzie) Schwartz, Climate Change Compliance Analyst, National Grid. Thank you for the opportunity for us to present our support for the objectives of this legislation.

Climate change is the greatest challenge that humanity faces and at the same time it's the greatest challenge of the energy industry.

National Grid believes in the science of climate change and has a blueprint for drastically reducing greenhouse gas emissions (GHG) 80 percent below 1990 levels by 2050 (80x50) called the "Northeast 80x50 Pathway."

Our approach aligns with New York City, New York State and the Northeast clean energy transition policies – including the proposed NYC legislation Int. No. 1253 -- to help reduce greenhouse gas emissions by 2050. We are a strong advocate for policy and regulatory approaches that provide reasonable methods to help achieve emissions targets in a reliable and

affordable way on behalf of our customers. And we look forward to the opportunity to collaborate with the City on this new legislation.

For National Grid, climate change isn't a political question, but scientific fact, and we believe that innovation and a diverse set of stakeholders at the table will enable us to reach the clean energy future that we all want. We are happy to join with the NYC Council in its pursuit to help combat climate change through this proposed legislation.

National Grid is also co-sponsoring a study with the Mayor's Office of Sustainability and Con Edison to begin the process of evaluating different pathways that New York City can pursue to effectively reach its goal of achieving 80 percent reduction in carbon emissions over 2005 levels by 2050, while maintaining safe, affordable, and reliable delivery of energy. The alignment of these efforts will help us achieve the greenhouse gas reductions we are all hoping to achieve. And while we pursue this goal, we will be looking for ways to reduce carbon emission in a cost effective way for our customers.

At National Grid, we've already taken concrete steps to move toward a clean energy future. Modernizing our infrastructure to meet 21st century

demands and connecting customers to renewable energy will help us toward a future of an integrated, decarbonized energy system.

We show our commitment to that future through innovative projects such as our four Reforming the Energy Vision (REV) pilot projects incorporating cogeneration, gas demand response, smart homes and geothermal technology; the Newtown Creek renewable natural gas (RNG) demonstration project (in partnership with New York City Department of Environmental Protection). Over the years, we have also partnered with NYC and have phased out the use of #6 and #4 heavy oils in approximately 800 buildings. And we are looking at opportunities in the transportation sector to help drive down greenhouse gas emissions. We have also developed a new aggregate data upload process leveraging the EPA portfolio manager site to make it easier for our customers to obtain their annual aggregate usage data that is used to comply with Local Law 84 and Local Law 87.

We also continue to play an important role in transforming the heating sector through energy efficiency and oil-to-gas conversions.

Those who convert to natural gas heat enjoy convenience, a price discount compared to competing fuels and a "green" benefit that reduces emissions. Each year in New York City and on Long Island National Grid adds about 8,000 residential and commercial customers who shift from oil heating to natural gas – the equivalent of pulling 500,000 cars off the road for one year. As we bring on additional Renewable Natural Gas (RNG) projects, like Newtown Creek, we will begin to decarbonize the gas networks through which we deliver energy to our customers.

For nearly a decade, National Grid has provided customers with award winning energy efficiency programs that have helped save tens of thousands of therms annually, reducing energy use and their carbon footprint. In 2017, we provided more than $20 million in energy efficiency services and incentives to save our customers more than 4 million therms per year. We also offer a variety of rebates and incentives on energy efficient products to help customers save energy and money and we process more than 9,000 customer energy efficiency rebates each year. We are in the process of launching an e-commerce site which will provide customers instant rebates on eligible EE measures. We're also partnering

with Con Edison, offering a new one pipe steam system energy reduction program.

And, we're committed to doing more to help our customers make more informed energy choices and develop new energy products and services.

National Grid looks forward to working with New York City to help finalize this legislation, and apply our array of energy solutions to help the City achieve its aggressive greenhouse gas emission targets.

Thank you.

##########

FOR THE RECORD

Testimony of Richard Leigh, PhD, PE, LEED AP
Visiting Professor of Physics, Department of Mathematics and Science,
Pratt Institute, Brooklyn, NY
before the
New York City Council Committee on Environmental Protection
In relation to the
Commitment to achieve certain reductions in greenhouse gas emissions by 2050,
Intro 1253-2018
Committee Room, City Hall, New York, NY
December 4, 2018

Good afternoon, Chairman Constantinides and Members of the Committee, especially my own Council Member, Mark Levine. I'm very pleased that you are a sponsor of this extremely important proposed legislation. I am Richard Leigh, and I am a Visiting Professor of Physics at Pratt Institute, where I primarily teach green building science. I was also Director of Research at Urban Green Council for eight years, ending in 2016, and am now a "Senior Advisor" there, and also a member of the Building Partnership. You have heard the Partnership's thoughts presented by John Mandyke, and in today's testimony I am speaking solely for myself.

During my time at Urban Green I was originator and lead author of the 2013 study "90 by 50," in which we showed that New York City could reduce its carbon emissions 90% by 2050 using current, although cutting edge, technologies. (www.urbangreencouncil.org/content/projects/90-50) Using data from the Lend-Lease costing department, we found that in buildings the changes would be cost-effective due to energy savings if the capital could be amortized over twenty-five years, like a mortgage. I mention this as evidence that your mission is not quixotic, although it will certainly be difficult.

Intro 1253 has many features that will contribute to ensuring a sustainable future, including the creation of a dedicated Office of building energy performance, and the formation of a Committee to develop rigorous and realistic targets for greenhouse gas (GHG) reductions. The legislation also recognizes that it will take some years for the Office and Committee to carry out their work, and that many in the building community will take no immediate action if the law simply refers to regulations being developed by a committee. To circumvent these delays, legislation includes (§ 28-320.3) "backstop" limits on emissions, one set effective during the periods 2022 - 2024 and a second, effective during 2024 – 2029. The legislation states that any limits developed by the Office and Committee must be at least as stringent as these backstop values. I would like to focus on these backstop emission limits.

What is the purpose of these backstop limits? First, it is to ensure that emission reductions start soon and are adequate to put the building sector on a path to 80 by 50. But to ensure the success of the legislation, the limits should also be technically feasible, reasonably fair across building sectors, and should ensure that reasonable, informed actions by building owners and managers will lead to compliance with the legislation. If compliance is unfair, difficult to verify, or snatched away by changes beyond the control of the building managers, the legislation will be reversed and serious harm done to our efforts.

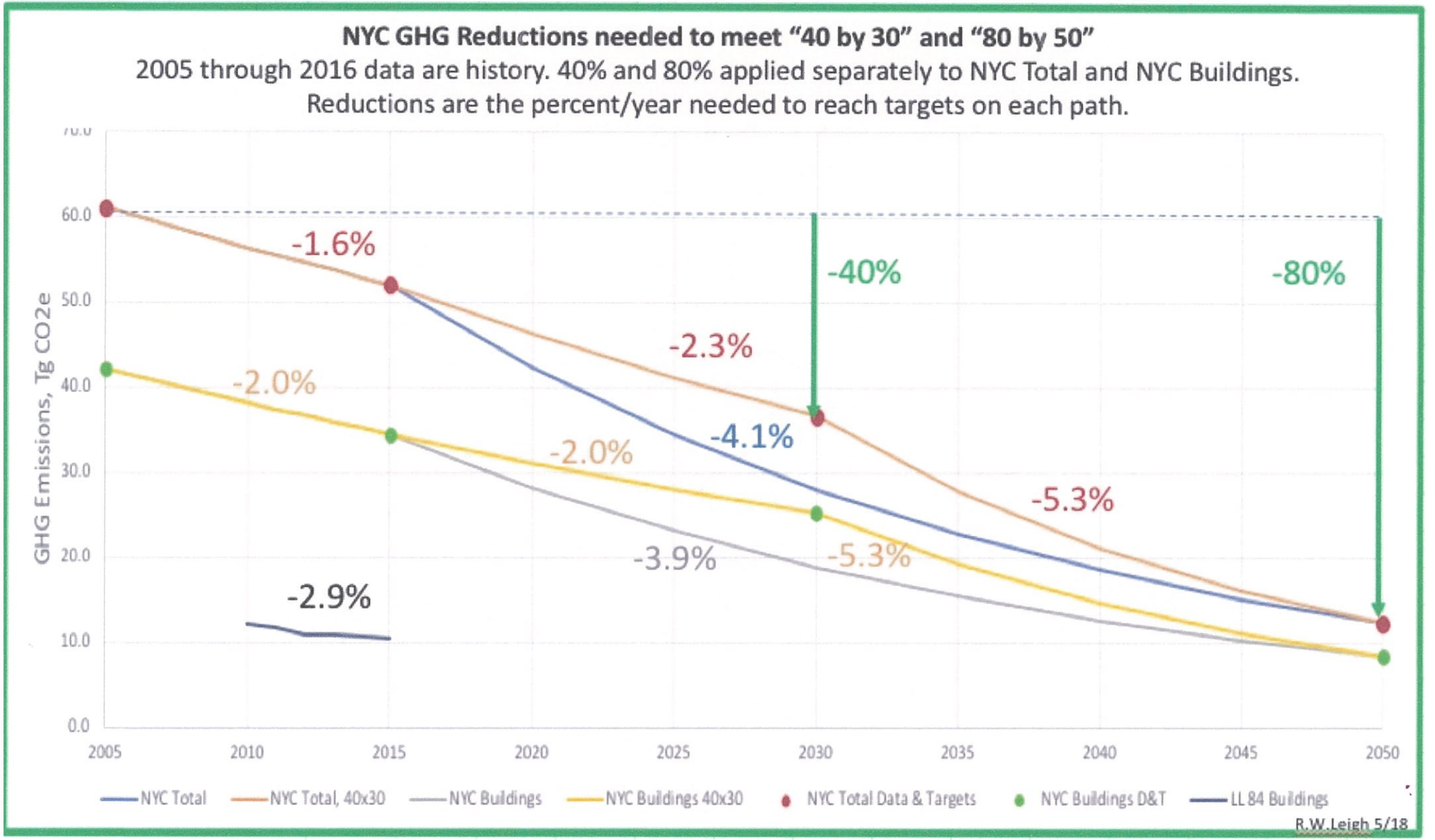
The emission limits are based on an apparently straightforward metric: emissions of CO_2 and other GHGs, known collectively as CO_{2e} per square foot of interior building area. The limits to be in place for 2022-2024 range from 0.005 to 0.009 ton CO_{2e}/ft^2 per year, depending on building occupancy group, and from 0.001 to 0.005 ton CO_{2e}/ft^2 per year or 2024-2029. I have four areas of concern with these limits:

- First, they are excessively stringent on the time scale proposed. For the 2022-2024 limits (effective three years and one month from today), as presented, something like 20% of both residential buildings and office buildings would have to lower their emissions by 10 to 20%, which would in many cases require capital expenditure. The process of engineering, financing, and carrying out construction work on this scale is extremely challenging, and will often not be possible. Moreover, these expenditures will not normally be synchronized with the building's capital plans. Even for the 2024-2029 period, coordination with capital expenditure cycles may be difficult, at least initially.
- Second, although there are differences in the limits for different building use and occupancy classifications, the limits do not seem to recognize that, for instance, a supermarket typically uses two to three times the source energy of a retail store, but both are classified "M" (along with "B" and "I") in this scheme. If this scheme is pursued, the building classifications must be made much more fine grained.
- The use of CO_{2e} as a metric is a source of problems in itself. About 30% of GHG emissions from buildings are due to electricity, and the emissions from buildings therefore depend on emissions by the generators of electricity. New York City currently has relatively low emissions associated with its electricity consumption, but that will change in 2021, when the Indian Point nuclear power plant is expected to be shut down. Urban Green Council has calculated that New York City's GHG emissions may return to 2010 levels in that year. (www.urbangreencouncil.org) Over ensuing years, as off-shore wind and other low-carbon sources of electricity are implemented, the carbon intensity of the grid will again improve, and emissions from buildings will decline. These gyrations will be completely beyond the control of building managers, who will be held responsible and fined for changes in the grid as the legislation is currently written. The resulting resistance could set the effort back years.
- Finally, the limits as written are too stringent to serve as a "backstop." The 2024-2029 limits will require over half of all covered buildings to lower their emissions by at least 30%, and much more for those at the high end of the distribution. These "backstop" limits should not be calibrated to meet 80 by 50. They need only be enough to ensure the building owners and managers start to work. The Office and the Committee can then prepare limits that will be more stringent, and consistent with 80 by 50.

To overcome these obstacles and ensure the success of this effort, I ask you to consider:

- Change to a source energy metric, rather than CO_{2e}. This will eliminate the Indian Point problem. The Office and the Committee can use a GHG metric if they find it advisable.
- Switch to a scheme that requires every building to lower its source energy consumption by some set percentage (2-4%) per year. This will eliminate issues around occupancy, usage, and variations in construction, but the same overall reductions can be required.
- Alternatively, require all New York City buildings to achieve increasingly challenging scores on the US EPA's Energy Star rating system. Although Energy Star has issues, this will at least bring building usage and occupancy into the criteria, so low-use buildings do not get a free pass, and buildings with server farms are not unfairly penalized.

Thank you for the opportunity to make these remarks. Although I may have sounded critical, it is only because of the great importance of this task, and the need to generate legislation that will produce the required emission reductions in the real world. I would be happy to answer any questions, and can be reached at rleigh@pratt.edu or 646-872-0493.


NYC GHG Reductions needed to meet "40 by 30" and "80 by 50"
2005 through 2016 data are history. 40% and 80% applied separately to NYC Total and NYC Buildings.
Reductions are the percent/year needed to reach targets on each path.
GHG Emissions, Tg CO2e
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2005
2010
2015
2020
2025
2030
2035
2040
2045
2050
-1.6%
-2.3%
-5.3%
-40%
-80%
-2.0%
-2.0%
-5.3%
-4.1%
-3.9%
-2.9%
NYC Total
NYC Total, 40x30
NYC Buildings
NYC Buildings 40x30
NYC Total Data & Targets
NYC Buildings D&T
LL 84 Buildings
R.W.Leigh 5/18

BRIGHT POWER

Your Energy & Water Management Partner

The Committee on Environmental Protection
The Honorable Costa G. Constantinides, *Chairperson*
City Hall Park, New York, NY 10007

Jeffrey Portman

Testimony submitted in response to Ints. 1253 and 1251

I am the Founder and CEO of Bright Power, one of NYC's leading clean energy and energy efficiency companies. We currently employ over 120 people in NYC, and have been growing 30% every year for a decade. As a creator of both jobs and carbon reductions, we welcome the Council's and Mayor's leadership on energy and climate issues.

Regarding Int 1253, we applaud the structure of this bill which sets ambitious targets for energy and emissions reductions in NYC's larger buildings. Such a policy will have a strong, positive impact on the business of Bright Power and other players in the energy efficiency industry, creating good jobs, increasing economic activity, and improving buildings.

However, we have four primary concerns:

1. **Schedule.** The implementation schedule of the targets is overly ambitious, particularly for 2024. Trying to hit targets this aggressively could lead to shoddy work and detrimental boom-bust cycles in the energy efficiency contracting market. We would recommend a more gentle ratcheting down of maximum emissions targets over a longer time period.
2. **Renewable Energy.** Define what "green energy sources" are acceptable to offset carbon emissions. In addition to customer-sited systems, we suggest that renewable energy purchased from community solar and other systems that feed New York's energy grid should be allowed.
3. **Insufficiently Nuanced Building Categories.** There needs to be more different emissions limits for more categories of buildings, accounting for type of use, occupancy, and other key operating characteristics. For example, 9-5 office buildings and 24/7 hospitals should not be held to the same emissions standard.
4. **Interactivity with Int 1251.** In the ENERGY STAR scoring system, electricity use has high source EUI and therefore leads to lower ENERGY STAR scores. Consequently a building that reduces carbon emissions for Int 1253 by increasing electricity usage could find that it ends up with a lower letter grade under Int 1251. Put another way, 20% of multifamily buildings today would be under the Int 1253 2022 limit AND receive a D under proposed Int 1251 grades.

Further regarding Int 1251, we have worked extensively with ENERGY STAR grades and don't think the new proposed ranges for A, B, C and D make much sense. The most logical breakpoints would be quartiles: 75-100= A, 50-74 = B,

25-49 = C, 1-24 = D. But more importantly, rather than changing these grades, we encourage the Council to put its effort into developing -- in collaboration with the energy efficiency, environmental and real estate communities -- a NYC-specific energy and carbon metric, to roll out as soon as possible.

Through our EnergyScoreCards platform, and in partnership with others including the Building Energy Exchange, we have done extensive research on understanding the energy performance of buildings in NYC and beyond, the drivers for energy efficiency and inefficiency, and what energy and carbon improvements are feasible in different scenarios. We would be happy to share our knowledge with council staff and the working group to develop future CO2 reduction methodology that is fair, rigorous and grounded in deep knowledge of NYC buildings.

In summary, we feel that, with adjustments to Schedule, Green Energy definition and Building Categories, Intro 1253 would result in a helpful new policy that will lead NYC toward economic growth and its 40x30 and 80x50 carbon goals.

C-PACE ALLIANCE

Testimony in Support of Bill T2018-3294 To Create a Sustainable Energy Loan Program
Cliff Kellogg, Executive Director, C-PACE Alliance
December 4, 2018

Good morning. My name is Cliff Kellogg, and I am the Executive Director of C-PACE Alliance. We are a coalition of six of the largest capital providers of Commercial PACE financing, as well as leading law firms and an accounting firm, all of whom are experts in Commercial PACE transactions (www.c-pacealliance.com). C-PACE Alliance members invested hundreds of millions of dollars in C-PACE transactions in programs nationally.

The C-PACE Alliance strongly supports bill T2018-3294 that will create a New York City sustainable energy loan program similar to a C-PACE program. C-PACE programs enable commercial property owners to pay for energy efficiency upgrades and renewable energy systems via a voluntary assessment that is added to their property tax bill. This system overcomes many of the obstacles that can deter owners from making worthwhile energy improvements. Nationwide, more than 1,700 C-PACE transactions enables over $750 million in upgrades.

The City Council should pass bill T-2018-3294 because New York City's building stock includes older, inefficient structures that are overdue for energy improvements.

Finally, we would like to draw the Council's attention to four areas for improvement in revised bill language or in rulemaking:

1. Clarify that all unpaid assessments will be enforced in the same manner as unpaid taxes. This means that participate in the City's tax lien sale program AND that the City will not accept partial payments of a property's tax bill.

2. The Program Administrators' administrative fees should be kept low. Many successful programs operate with administration fees of 1 percent or less, with per-transaction caps. Annual servicing fees are justifiable only to cover the program' out-of-pocket expenses.

3. Obtaining mortgage holder consent for all C-PACE financing should be mandatory. Because unpaid assessments are senior in priority to a traditional mortgage in liquidation, obtaining lender's consent avoids problems from a mortgage holder saying it was unaware of the assessment. This requirement should be in the rules, if not in the bill itself, for all C-PACE financing.

4. C-PACE Alliance requests the deletion of §11-3004 that subordinates C-PACE assessments to all other liens and arising out of taxes and assessments, and other city charges and interest. Reducing energy consumption is a public benefit just like sewer and water charges. To make PACE "less than" other taxes undermines its reception in the capital markets. If New York City subordinates the C-PACE assessments to other charges, it decreases the likelihood of collecting assessments, raises the cost of capital, and reduces the number and scale of energy upgrades.

We would appreciate more certainty on the timing of enforcement through tax lien sales or foreclosures, since this is in the City's hands.

Thank you for the opportunity to support Bill T2018-3294. Our members look forward to funding energy improvements in New York City soon.

###

URBAN INGENUITY

The New York City Council - Committee on Environmental Protection
Hearing on T2018-3294, A Local Law to amend the administrative code of the city of New York, in relation to establishing a sustainable energy loan program

Testimony of Bracken Hendricks
President & CEO, Urban Ingenuity | DC PACE Program Administrator
December 4th, 2018

Good morning Committee Chair Constantinides and esteemed members of the Committee on Environmental Protection. My name is Bracken Hendricks. I am president and CEO of Urban Ingenuity, a company based in Washington, DC with a presence in New York City. My company serves as program administrator for the District of Columbia's Commercial PACE financing program, on behalf of the DC Department of Energy and Environment. I testify today to register my strong support for T2018-3294 and to share insights on commercial PACE based on Urban Ingenuity's experience designing, launching, and successfully operating DC PACE in collaboration with local government. Thank you for the opportunity to testify on this important legislation.

DC PACE was first established by an act of the DC Council in 2011, then refined as a financial product through a pilot phase and legislative amendments, and ultimately commercially launched as a scaled program in 2015. Urban Ingenuity has served as the third-party program administrator since the program's inception. Despite its small geography the District has one of the ten largest PACE programs in the country by dollars deployed, representing approximately $40M that has funded 26 projects to date. The program has benefitted a wide range of building types, including: houses of worship, community centers, non-profit offices, retail establishments, commercial office buildings, charter schools, affordable and market-rate multifamily housing, and a stadium.

Today property owners face significant financial barriers for energy and water saving upgrades. Despite long-term savings, upfront costs of improvements are a major obstacle for many owners, and information barriers and other market failures stand in the way of robust adoption of clean energy. As a result, there is a large unmet capital market need. Organizations like non-profits, churches, and small businesses are particularly underserved. PACE offers three key benefits that should be understood by Council: 1) It can fund 100% of project capital costs overcoming upfront cost barriers, 2) It can be cash flow positive, with ongoing debt service paid for out of utility bill savings, and 3) The obligation is tied to the property not the borrower's credit, which can diversifying access to capital for beneficial cost saving projects. Together these features make PACE a useful companion to energy efficiency mandates, in funding near-term costs in order to access larger long-term benefits.

I want to call particular attention here to DC's experience with PACE in service to housing affordability and community development. One third of all DC PACE projects have served multifamily housing. This includes the first use of PACE on a Low-Income Housing Tax Credit (LIHTC) property, and the first HUD approval of PACE for a project receiving ongoing rental subsidies through a housing authority. We worked with the District's revenue bond program to structure the first tax-exempt PACE project allowing a community-based non-profit to fund major building upgrades at low tax-exempt rates, lowering operating costs. We also secured the first PACE approval from the U.S. Small Business Administration outside California, setting national guidelines that now allow small business owners to underwrite PACE with SBA loans. DC is not alone in this innovative work to expand PACE for economic development. In this State, Energize New York has successfully used Qualified Energy Conservation Bonds to buy down interest rates for affordable housing and non-profit organizations. In Michigan PACE has been used extensively to upgrade US Department of Agriculture funded affordable housing. In each case PACE brought new resources to existing public finance programs.

In New York City you are fortunate to already have a strong ecosystem of tools and institutions that reduce barriers to efficiency and clean energy. The New York City Energy Efficiency Corporation (NYCEEC) deserves special mention as the nation's first local green bank, along with important state agencies like NYSERDA and the NY Green Bank. The PACE bill before you today will work with this suite of financing products, incentives, and technical assistance to lower cost barriers and make green building upgrades affordable to local property

owners. PACE is unique within this toolkit, with longer terms and key characteristics that make it useful for capital-intensive projects, multi-measure retrofits, and customers who are highly cashflow sensitive, enabling larger and deeper retrofits. PACE will also benefit from this policy ecosystem. For example, NYCEEC's predevelopment loans can help owners conduct feasibility analysis and engineering to secure long-term PACE financing, while NYSERDA technical assistance and rebates will accelerate uptake of PACE. NYC PACE will be highly complementary with these existing resources and help to fill capital gaps for underserved customers.

PACE also supports energy and climate goals beyond efficiency. In D.C., storm water retention is a critical policy objective, causing many new buildings to face high regulatory retention standards. DC PACE has been used successfully to support measures like green roofs and porous paving to help owners meet these standards, and the District to meet environmental goals. PACE can also be used to fund resilience through solar and battery storage installations or microgrids, helping protect residents from grid outages like those in Superstorm Sandy. Resilience is increasingly a matter of social justice, as the losses of a changing climate are felt both in economic harm and human suffering. Finally, PACE is a tool for supporting community solar and grid stability. By offering stable long-term debt to fund capital investments at the building level, PACE can support the heavy lifting of rewiring regional distribution networks to manage energy demand and balance distributed generation, improving system reliability and stabilizing loads. All of these investments also mean good jobs.

Finally, I'd like to cite few lessons learned from our experience over several years. First, I encourage this Committee to pass legislation that sets financial and technical underwriting criteria through administrative policies informed by stakeholders, rather than in legislation. When municipalities have instituted strict underwriting through statute, it can unintentionally exclude properties with non-traditional credit like affordable housing, or restrict the amount of financing owners can access even for desirable but capital intensive projects like net-zero energy buildings. The District's PACE-enabling legislation originally contained a Savings-to-Investment requirement that mandated project savings exceed costs of debt service. Over time we realized this test failed to account for a range of public benefits, and recently amended the legislation. Allowing program guidance to set standards creates flexibly to respond to market needs while maintaining consumer protections.

In addition, an open market design should be your program standard, to permit participation from a wide range of qualified financial institutions including local and regional banks along with national PACE-specialty lenders. An open market creates competition, drives down costs and increases customer choice, and lets capital providers build customer awareness. In DC however, we realized that local banks found it difficult to offer fully amortizing 20 year fixed rate PACE products. To expand involvement of community lenders, DC PACE accommodated local banks by allowing PACE notes with periodic rate adjustments on fully amortizing notes. This simple accommodation now means that local bankers are among the program's biggest funders.

In closing let me say that while PACE promotes high end green building, we learned from experience that it is first and foremost a solution for addressing deferred maintenance and for funding large capital improvements that are otherwise hard for building owners. As such, PACE is not just a tool for LEED certified buildings in high rent neighborhoods. Rather, commercial PACE will be as likely to serve local retail in outer boroughs, to retool manufacturing, or to swap out boilers in owner-occupied warehouses to cut utility bills and protect jobs.

For all of these reasons, I urge the Committee to advance T2018-3294 and launch a well-designed commercial PACE program for New York City. I welcome any questions and am available to further support your work on this important legislation as you launch NYC PACE. Thank you for this opportunity to testify before you today.

Bracken Hendricks, CEO, Urban Ingenuity & DC PACE Program Administrator
Contact: 202-796-8925 | info@urbaningenuity.com | www.urbaningenuity.com

ACEC New York

American Council of Engineering Companies of New York

Testimony on Intro. 1253

Submitted to the City Council Committee on Environmental Protection
December 4, 2018

Good morning Chair Constantinides and Committee members. My name is Josephine Zurica, PE, LEED AP. I am Principal at Dagher Engineering and Vice Chair of the American Council of Engineering Companies of New York's (ACEC New York) Energy Codes Committee on whose behalf I am appearing today. Thank you for this opportunity to testify.

ACEC New York represents close to 300 consulting engineering and affiliate firms throughout New York State, with a concentrated presence in New York City. Our members plan and design the structural, mechanical, electrical, plumbing, civil, environmental, fire protection and technology systems for the City's buildings and infrastructure.

This year, our Association adopted "Principles for Reviewing New York City energy legislation." These Principles state; *"New York City should strive to be a leader in sustainability, green building, energy efficiency and carbon emissions reduction. In doing so, the City must take into account scientific principles, operational uncertainties within buildings, and must have reasonable expectations regarding future advances in technology."*

Bearing this in mind, ACEC New York supports the goal of Intro. 1253 but opposes the bill in its current form. We have identified the following issues with the bill as drafted and offer the recommendations below:

Timing: The 2022 and 2023 enforcement periods are too soon. The engineering community in New York will be adversely impacted as there will not be time to organize, develop methodologies and best practices, address insurability issues as well as design, construct and commission what in many cases will be major alterations to buildings needed to achieve success for our clients in satisfying these carbon reductions requirements. **Recommendation 1:** Enforcement should begin in 2024, allowing enough time to prepare. **Recommendation 2:** Require the Working Group, as established in the bill, to publish a Reference Standard for building designers to:

- Make the stakeholders' responsibilities clear.
- Establish an accepted standard of care for building design.
- Maintain insurability.
- Avoid lawsuits between stakeholders.

Structure of Carbon Reduction Regulations: The building classification system as currently proposed in the bill (pages 8 and 9) is completely inappropriate for regulating carbon emissions. A hospital has no relationship to a big box retail store when it comes to energy use, any more than a 24 hour financial trading operation has in relation to the millions of square feet of general office tenants in our Class B buildings, yet the bill, as currently written would treat all these building occupancies according to the same limits. With this system, some owners will never be able to meet the requirements no matter what efforts they undertake, and some will do so without even trying. As a result, there will be little

incentive to attempt to reduce carbon emissions and we will not make progress toward our shared goal. Furthermore, the fact that no benchmarking data yet exists for buildings between 25,000 and 50,000 square feet is problematic. In many cases these buildings may bear little similarities to their larger neighbors for which there is collected data. As a consequence, the initial building emissions intensity limits established for buildings 25,000 to 50,000 square feet will be entirely conjectural. **Recommendation 1:** Intro 1253 should instead use the building classification system that is already in place (for several years now) for energy benchmarking (Local Law 84). The proposed building emissions intensity limits in the bill can easily be adapted to this system. In addition, the initial carbon dioxide equivalent metrics should be identified in Intro 1253 for the 2022 and 2023 compliance years and should be specific to New York City. **Recommendation 2:** In the initial enforcement period, 2022-2023, the city should issue notices of either compliance or non-compliance to building owners, stating what the penalty will be for non-compliance in the future (i.e., not collecting penalties in this initial period). It is important to appreciate for every dollar an owner spends on a penalty that is one less dollar they have to spend on carbon reduction. This period will enable the city to determine whether the initial building emissions limits are reasonable for building types that have been benchmarked, and to obtain data for buildings for which there is no benchmarking data. This information can be used by the Working Group to revise building emissions limits that will achieve the greatest reduction overall for the entire city building stock, while insuring that limits are equitably levied across each segment of the building stock.

Affordable Housing Exclusion: While we fully support the need to maintain affordable housing for New Yorkers, the blanket exclusion of ALL affordable housing, which we understand would include entire buildings where only a portion of the units are affordable, takes too much of New York's carbon emissions off the table. **Recommendation:** In order to reach 80x50, revisit removing such a large percentage of the building stock in this effort.

Thank you for this opportunity to provide testimony. If you have questions or would like to meet to discuss these comments with representatives of our Energy Codes Committee, please let us know.

CATHOLIC COMMUNITY RELATIONS COUNCIL

80 Maiden Lane, 13th Floor, New York, New York 10038

Testimony of Joseph Rosenberg
Executive Director, Catholic Community Relations Council before the
New York City Council Committee on Environmental Protection
December 4, 2018

Good morning Chair Constantinides and Members of the City Council Committee on Environmental Protection. I am Joseph Rosenberg, Executive Director of the Catholic Community Relations Council, representing the Archdiocese of New York and the Diocese of Brooklyn.

The aim of reducing gas emissions is a necessary one, not just in our City but worldwide. This is a topic of tremendous consequence and global significance. Any legislation intended to successfully address this challenge must be far ranging in scope but must also create a viable process for property owners. Without establishing appropriate criteria and realistic timelines, not only will owners risk the failure to meet these goals, but the attempted costs of compliance could have unforeseen consequences on many property owners, and ultimately result in collateral damage to our City.

The core mission of the Archdiocese of New York and the Diocese of Brooklyn is to help the needy in New York City, be it the hungry, the poor, the immigrant and the refugee, the elderly and the disabled. Many of the Church owned properties covered by this bill house these mission driven social service operations. Scarce monies that are available to both the Archdiocese of New York and the Diocese of Brooklyn are used for operating and expanding these human service provider priorities, keeping our houses of worship open, and allowing the Catholic schools to provide quality education for over 82,000 New York City children.

The Catholic Church in New York City owns over 370 properties that would be covered by this legislation. These properties consist almost exclusively of houses of worship, schools and low-income housing developments. The low-income housing properties include Federal 202 projects for seniors and Section 8 developments where rents and financing are administered and regulated by HUD. The City Council's interest in exempting rent regulated housing from these legislative mandates should also cover Section 202 and Section 8 projects. These two programs, although not covered by rent regulation laws, house extremely low-income individuals and families under Federal rules and regulations. They deserve the same exemption that the Council is providing to rent regulated developments under New York law.

You are familiar with the architecture of many of our churches, which are often over 100 years old and contain high vaulted ceilings and ornamental stained glass. These are unique and complex characteristics that challenge and defy many sophisticated efforts to implement energy reduction measures. Houses of worship should be exempted by the provisions of these bills.

All of this is a reminder that not all buildings fit the same profile and have the same energy reduction challenges, nor do all owners have the same resources to comply with these unrealistic time frames and financial burdens. We, therefore, ask that a specific dedicated funding stream for religious organizations and nonprofits be created to help us comply with these mandates.

This legislation requires all property owners with buildings 25,000 square feet or more to meet these emission reductions standards by as early as 2022. This is an unrealistic timeframe, especially for large building upgrades that require years to plan and finance. The deadlines also do not take into account that some buildings might have recently installed viable and energy efficient building systems including boilers, roofs and heating systems. Are these all to be replaced at great cost even if they have a life expectancy of many additional years in order to meet an inflexible energy percentage reduction by a certain date?

The deadlines contained in these bills are especially daunting for religious organizations. Few, if any, of our parishes have experience with energy management of their properties due to staff with limited technological expertise, constrained finances and difficulty accessing available resources. Technical assistance should therefore be provided to religious organizations and nonprofits to comply with the goals of these bills. Although the language is vague, we do appreciate that Intro. 1253 refers to establishing programs in order to assist compliance from building owners who do not have adequate financial resources and technological expertise. This is a helpful start, although additional details and funding commitments to achieve these goals need to be specified.

Intro. 1253 also creates an advisory task force to include representatives of practically every sector affected by these mandates. They include construction trades, the green energy industry, residential and commercial tenants, the business sector, environmental advocacy organizations, the public utilities industry and nonprofit institutions. We are greatly affected by these proposed mandates and ask that religious organizations be part of this task force. We also urge that the task force not serve merely an advisory function and instead should be part of the administering agency's efforts to define and implement this mandate.

It is important for all of us to dedicate ourselves to the reduction of greenhouse gas emissions. It is also just as important, however, that the mechanism and financing for doing so be viable and not create unforeseen and unfortunate consequences for religious organizations, nonprofits and the residents of our City.

Thank you.

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

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

Testimony Before the Environmental Protection Committee
December 4, 2018

Good morning Chairman Constantinides and members of the Environmental Protection 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. We wish to speak today in support of the guiding principles behind the three pieces of legislation before you, but also to raise some questions and offer some suggestions. CNYC was pleased to participate in the Building Partnership convened by Urban Green Council to discuss energy regulations, and we support the gamut of suggestions published in the Blueprint for Efficiency.

CNYC recognizes the care that has gone into crafting the comprehensive bill that sets standards for measuring concrete and specific progress toward the City's ambitious goal of reducing our 2005 carbon footprint statistics by 80% by the year 2050, through the establishment of an Office of Building Energy Performance. We appreciate that the legislation acknowledges that housing cooperatives and condominiums have little control over actual energy use inside apartments. We also recognize and appreciate the efforts to differentiate among types of buildings when establishing progressive requirements for energy conservation progress, but this needs to be expanded considerably to take into consideration hours of operation, nature of the population (e.g.:seniors v. large families in housing; labor intensive vs. technology intensive businesses, services, etc) if expectations are to be realistic and achievable.

The majority of CNYC members will need to undertake significant capital projects to comply with the levels of reduction required by the proposed legislation. Not only will these capital expenditures have to vie with other mandates, but the tight time frames in the current bill make it a real challenge to engage in the careful long range technical and capital planning every building need to undertake to address energy requirements along with all the other mandates and requirements of City law. Short term 'fixes' or one -off projects may help meet an interim requirement, but could, in the long run, prove to have

Please turn the page . . . . .

been a side track or an unnecessary expense.. Once in place, new systems need to be tested, fine tuned, and integrated into building operation before they function as they should. This would make it difficult to impossible for most buildings to meet the interim requirements for the years 2022, 2023, 2024 proposed in this legislation, most particularly the smaller 25,000 to 50,000 square foot building that are only this year first subject to benchmarking requirements, with the insights that one hopes will result. And larger building that have already invested in costly new equipment and sophisticated retro-commissioning protocols recommended in their energy reports, are wondering whether they will have the opportunity to amortize these investment.

Buildings need to plan for the long term and the very long term, seeking input from experts, mapping out a progressive program of upgrades, replacements, etc. and finding the funds to implement these projects. Yes, many energy projects eventually recover the cost of their installation through energy saved, but how is the initial cost covered? In cooperatives and condominiums, home owners must either borrow to meet these unanticipated additional costs or reach into their own pockets for assessments and higher carrying charges.. Co-op underlying mortgages are typically refinanced at ten year intervals, so boards and finance committees try their best to foresee and provide funding for all major projects the cooperative will face in the interval, while still keeping debt at a level that does not overwhelm resident owners. Condominiums associations have far less borrowing power and have little recourse other than to the home owners to meet the cost of these mandates.

CNYC supports with enthusiasm the legislation establishing a Sustainable Energy Loan Program to fund energy improvements and encourages the widespread use of this program as well as expansion of the services of the NYC Retrofit Accelerator. We are pleased to learn of expanding efforts by NYSERDA and local utilities to help in energy conservation and carbon reduction efforts. We also suggest linking the improvements to meaningful incentives, such as an enhanced and financially realistic J-51 program or property tax abatements calibrated to demonstrated energy savings.

The legislation that seeks to modify the letter grades required by Local 33, so that benchmarking scores would provide be more in line with American school grades would be more readily understood than the scale prescribed in Local Law 33. However, since the legislation also call for a new performance metric tailored to New York City buildings, we respectfully suggest that the new NYC metric be used as the basis of eventual energy grades, and that the requirement for such grades be postponed until that metric has been created and tested.

Thank you for your consideration; I welcome any questions you might have.

New York City Council

Committee on Environmental Protection

Hearing Testimony: Int. 1253-2018 (fossil fuel building limits), Int. 1252-2018 (loan program)

Andrew Title, Senior Director, State Government Affairs

GREATER NEW YORK HOSPITAL ASSOCIATION

Chair Constantinides and members of the Environmental Protection Committee, my name is Andrew Title. I am the Senior Director for State Government Affairs at the Greater New York Hospital Association (GNYHA). GNYHA's members include all of the hospitals and health systems in New York City, both public and voluntary, as well as others throughout New York State, New Jersey, Connecticut, and Rhode Island. Thank you for the opportunity to share our thoughts today on Int. 1253-2018.

GNYHA member hospitals, which are collectively the biggest employers in New York City, are committed to doing their part to fight climate change. We applaud the Council for taking up this important issue and support the intent of Int. 1253.

Many hospitals have already made large investments in improving energy efficiency. A large portion voluntarily joined the Mayor's Carbon Challenge, whose original goal was reducing energy use by 30% by 2020 and now aims to reduce it by 40% by 2030. (Five have agreed to work toward 50% reductions by 2025.)[1] Hospitals are working hard to meet these goals with the resources available, upgrading HVAC (heating, ventilation, and air conditioning) and lighting systems, reducing electricity consumption, phasing out heavier fossil fuels like number four and six fuel oil, and promoting energy conservation in the workforce.

However, GNYHA is extremely concerned about the unintended consequences of Int. 1253, which—as currently constituted—would adversely impact hospitals' most important mission: providing excellent patient care.

For the vast majority, the bill's targets are simply unachievable. Right now, it places the same energy-use limits on hospitals, academic medical centers, and commercial buildings—each of which serves very different functions, complies with different regulatory requirements, and operates during different hours. New York City's hospitals and health systems have some core goals: providing high-quality care 24 hours a day, 7 days a week, keeping their patients comfortable and safe, and achieving medical breakthroughs. To meet these goals while reducing their carbon emissions, they need evidence-based, realistic emissions goals that are the product of careful analysis.

The current approach for 2022 and 2023—hard caps on emissions based on building occupancy groups that don't take into account intensity of use and density—fails that test. We are similarly concerned about the plan for 2024 through 2029, which gives the City flexibility in setting emissions limits but nonetheless sets more stringent standards.

The financial penalties resulting from these unrealistic emissions limits—which are far above the Mayor's Challenge goals—would impose enormous financial burdens on New York City hospitals and ultimately put their viability at risk, potentially leading to further hospital closures in medically

[1] See http://www.nyc.gov/html/gbee/html/challenge/hospitals.shtml.

underserved areas where they are most needed and the loss of many good-paying union jobs. We have consistently communicated these concerns to the Council since the first version of the bill was introduced in October 2017.

Since Int. 1253's release on November 21, hospitals have done their best to calculate its potential impact. While they are still analyzing this highly technical legislation, *multiple institutions have estimated tremendous monetary penalties for exceeding its limits on total building emissions.* And unlike for-profit businesses, hospitals do not have the luxury of passing on these costs to anyone except governments and commercial insurance companies. Either way, this would result in increased costs for New Yorkers. For this and a variety of other reasons, we urge the Council to exempt hospitals from the bill's financial penalties and instead incentivize realistic efficiency upgrades.

We outline our concerns in greater detail below.

The bill's goals are unrealistic. Many hospitals use a combination of solar, wind, cogeneration,[2] and other "green" sources to supply as much of their buildings' energy needs as practicable. But the amount of non–fossil fuel energy hospitals would have to purchase to comply with this bill simply does not exist. *Available renewable energy only meets a small portion of New York City's demand, since most capacity is located outside the five boroughs.* That will not change until utilities and governments invest in new power plants and transmission lines to deliver that energy to buildings.

For example, one alternative to fossil fuels is nuclear energy. But if the Indian Point nuclear plant in Westchester County closes as expected, complying with this bill will become even harder. (The plant currently provides about a quarter of New York City's electricity.) In the circumscribed urban spaces that most New York City hospitals occupy—where real estate is often astronomically expensive—options like solar, geothermal, and wind are often not economical or even impossible to pursue.

Another problem with the bill is that it encourages buildings to shift toward electricity and severely penalizes them for any use of fossil fuels, even if that use represents a huge net reduction in greenhouse gases emitted. In recent years, Con Edison and the New York State Energy Research and Development Authority have heavily incentivized hospitals and other buildings to do the exact opposite: build onsite power plants, especially through natural gas-fired cogeneration—to avoid overloading the power grid during peak use times. While cogeneration often does involve burning fossil fuels, Int. 1253 ignores that they are many times more efficient than single-generation facilities—and penalizes hospitals for merely doing what they've been asked to do by state authorities

[2] These highly efficient plants, often natural gas-fired, harness the byproducts of energy production to power heat or air conditioning systems.

and utilities to prevent blackouts and brownouts for New Yorkers. This "regulatory whiplash" is extremely problematic.

We appreciate that the Council has made an effort to help hospitals retrofit their facilities—which are among the oldest in the country—via the loan program proposed in Int. 1252-2018. However, we do not believe that this financing plan would be sufficient, since it doesn't include any certainty on the funds potentially available and could end up saddling stressed institutions with even more debt. Further, hospitals cannot meet the bill's current standards because of the previously mentioned lack of green energy capacity.

Instead of placing the burden of fighting climate change on buildings, GNYHA urges the Council to focus on infrastructure development and addressing carbon emissions comprehensively with utilities and state and federal authorities.

Hospitals have unique and intense energy requirements. This is not something they can easily change—and putting arbitrary limits on fossil-fuel use would adversely impact quality of care and the communities hospitals serve every day. Int. 1253 places hospitals and nursing homes (Group I occupancies) in the same category as office buildings and retail (Group B and M occupancies). This doesn't make sense: these buildings have totally different functions, health and safety rules to comply with, and power demands.

In addition to standard energy needs—heating, cooling, light, air conditioning, heat—hospitals must remain in a constant state of operation to deal with whatever emergencies may arrive in the emergency department. Resiliency and reliability are also critical. During natural disasters and power failures, hospitals must retain the capacity to operate on their own and should not be penalized for maintaining cogeneration capacity that can help supply power during failures. They also house specialized, sensitive, and energy-intensive patient care equipment such as CT scanners, MRI machines, and a wide variety of computer equipment and servers to run the health information technology infrastructure.

Hospitals must also comply with numerous stringent standards to ensure sanitary air and infection control, which put great demands on their energy use. These medically necessary requirements, which are set by accrediting agencies and governments, cannot be relaxed. For example, the Centers for Medicare & Medicaid Services, the federal agency that regulates hospitals, has adopted American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) standard 170, which requires New York City hospitals to complete 15 air changes per hour in units like

operating rooms to ensure sanitary conditions.[3] Hospital air-change requirements are almost uniformly higher than commercial buildings, which generally complete three air changes per hour—yet right now the bill sets the same emissions limits for these extremely different building classes.

Another factor adding to hospitals' high energy requirements is the extensive research and training that occurs at New York City's world-renowned academic medical centers (AMCs). These institutions train tomorrow's doctors and regularly achieve medical breakthroughs that benefit our great city and the entire world. However, much of this research requires specialized equipment that uses a great deal of energy.

Many New York hospitals are struggling. Thirty around the State with less than 15 days cash on hand are already on a New York State Department of Health "watch list" and receive hundreds of millions of dollars annually from the State to keep their doors open. There are watch list hospitals in the Bronx, Brooklyn, and Queens, and Manhattan and Staten Island also have severely challenged institutions.[4]

Safety net hospitals serve communities with high uninsured populations and many Medicaid and Medicare beneficiaries. Unfortunately, these programs reimburse hospitals at well below the actual cost of delivering care. In order to make up the difference and stay afloat, hospitals must, if they can, negotiate higher rates with commercial insurers to cover the losses from public programs. Not all hospitals have enough privately insured patients to achieve this cost shift, which is the cause of the financial distress we have seen among our inner city safety net hospitals.

No one wants hospital closures. But the financials for New York State hospitals are among the smallest in the country: even the healthiest report operating margins of one to three percent (the national median is 2.7%).[5] These numbers are well below the profit margins of some of the City's successful for-profit businesses. If the most stable hospitals and health systems predict that Int. 1253's fines for noncompliance would be astronomical, it's hard to see how struggling safety-net institutions could come close to making the investments to comply with the bill's mandates.

The bill currently exempts buildings with rent-regulated apartments to prevent rent hikes on poor and working-class New Yorkers. Landlords that own these buildings have limited resources because of limits on the rent they can charge. The vast majority of New York City hospitals are

---

[3] An "air change" is the number of times the total volume of air from heating, ventilation and cooling systems enters and exits a room in an hour. The ASHRAE standard is available at https://www.techstreet.com/ashrae/standards/ashrae-170-2017?product_id=1999079&ashrae_auth_token=12ce7b1d-2e2e-472b-b689-8065208f2e36.

[4] New York City hospitals in the program include Brookdale Hospital, Jamaica Hospital, Flushing Hospital, St. John's Episcopal Hospital, Interfaith Medical Center, Kingsbrook Jewish Medical Center, and Wyckoff Heights Medical Center.

[5] See https://www.beckershospitalreview.com/lists/224-hospital-benchmarks-2018.html.

subject to similar constraints because the majority of their patients are enrolled in Medicaid[6] and Medicare, whose rates they have no control over—not to mention a large amount of uncompensated care from treating uninsured patients. We believe similar consideration should be extended to hospitals, particularly since many of them serve the same poor and working-class neighborhoods.

Int. 1253 would adversely affect workers and their communities. Collectively, hospitals and health systems are the biggest employers in New York City. These critical "anchor institutions" form the economic lifeblood of their neighborhoods, purchasing goods and services from local businesses and providing community benefits like school health centers, charity and uncompensated medical care, health fairs, and internship programs.

By imposing massive costs on hospitals, this bill—in its current state—would jeopardize thousands of jobs for union and non-union nurses, doctors, technicians, custodial staff, clerical staff, and technicians, among many others. And for the jobs that survive, it will be even harder to find money to increase salaries and maintain benefits like health coverage, tuition reimbursement, training funds, and pensions. We need to be extremely careful about putting these valuable institutions at risk—especially the struggling safety net institutions spread throughout the five boroughs—because of the people they employ and the communities they serve.

Major changes to the bill are necessary. GNYHA believes that hospitals should have a status similar to rent-regulated buildings. An exemption from the bill's penalties would be the simplest, most equitable way to ensure that New Yorkers continue to have access to world-class care, minimize increases in the cost of medical services, avoid hospital closures for communities across the city, and protect the jobs of thousands of workers and families that depend on them for their livelihoods.

To the extent practicable, GNYHA is committed to working with the Council on this issue. We are in the process of assembling a working group of hospital engineers to provide technical advice as this bill moves forward. However, this must be done in a deliberate way rooted in reality, rather than fidelity to an arbitrary timeline. We urge the Council to commit to determining the financial impact Int. 1253 would have on hospitals and other critical health care institutions—and how the bill's targets compare to current usage—before legislating.

I am happy to answer any questions you may have. Should you have any questions in the future, please contact me (atitle@gnyha.org) or David Labdon (dlabdon@gnyha.org).

---

[6] Medicaid rates have been frozen for the last 10 years. In the last state budget, 1199 SEIU United Healthcare Workers East and GNYHA were able to secure a $2 billion fund to increase them. Increased costs from Int. 1253 could wipe out those gains, which would have otherwise gone towards worker salaries, operations and equipment, and otherwise investing in patient-care infrastructure.

32BJ SEIU
Stronger Together

SERVICE EMPLOYEES
INTERNATIONAL UNION
CTW, CLC

HÉCTOR J. FIGUEROA
President

LARRY ENGELSTEIN
Executive Vice President

KYLE BRAGG
Secretary Treasurer

LENORE FRIEDLAENDER
Assistant to the President

VICE PRESIDENTS
SHIRLEY ALDEBOL
KEVIN BROWN
JAIME CONTRERAS
JUAN HERNANDEZ
ROB HILL
ALISON HIRSH
DENIS JOHNSTON
GABE MORGAN
MANNY PASTREICH
ROXANA RIVERA
JOHN SANTOS
JOHN THACKER

Capital Area District
Washington 202.387.3211
Baltimore 410.244.6299
Virginia 202.387.3211

Connecticut District
Hartford 860.560.8674
Stamford 203.674.9965

District 1201
215.923.5488

Florida District
305.672.7071

Hudson Valley District
914.328.3492

Mid-Atlantic District
215.226.3600

National Conference of Firemen and Oilers
606.324.3445

New England District 615
617.523.6150

New Jersey District
973.824.3225

Western Pennsylvania District
412.471.0690

www.seiu32bj.org

Committee on Environmental Protection

Intro. 1253
A Local Law to amend the New York City charter and the administrative code of the city of New York, in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2050

Testimony of David Cohen, Political Manager

December 4, 2018

Good morning Speaker Johnson, Committee Chair Constantinides and Committee Members. My name is David Cohen, Political Manager for SEIU 32BJ here in New York.

On behalf of the union's 85,000 members who work in our city's buildings, thank you for the opportunity to testify here today on Intro. 1253.

Our members sit at the nexus of this bill's impact. They live in communities and hail from countries that are disproportionately impacted by climate change as well as work in buildings that will be covered by the proposed law. In many instances it is our members who will serve as agents for change on the ground – utilizing skills taught in our green training programs to make their buildings more energy efficient. Our members also experience firsthand as tenants the challenge of maintaining affordable housing in our growing city.

On behalf of the union I applaud the efforts of the Committee Chair and the council to engage with stakeholders throughout the drafting process, including with my colleagues from the organizations I share the panel with today, and I strongly encourage the continuation of this dialogue. It is essential that we move forward with a plan to reduce emissions that is broadly supported, technically feasible and does not hurt or leave out those already vulnerable.

I acknowledge the care taken in drafting the bill to avoid the unintended consequence of triggering rent increases in rent regulated units by removing all buildings with one such unit from the definition of covered buildings. However, leaving these buildings out exempts over a third of the city's building square footage, making the long term efforts to achieve substantial reductions significantly harder by leaving a smaller portion of buildings subject to performance standards.

Important also, carving these buildings out risks denying rent-regulated tenants the benefits of cleaner air, more energy efficient apartments and lower energy costs.

We believe that the Advisory Board created by this bill – with the addition of housing advocates to its composition - should be empowered to consider how rent-regulated buildings can participate. This effort should be informed by the outcomes of the renewal of rent stabilization laws due to occur in Albany in 2019.

As an interim step, we encourage the council to consider the recommendation made by the 80x50 Buildings Partnership, convened by Urban Green, with respect to low-cost energy saving measures that do not trigger MCI increases. In addition, we support separate action by the council to appropriate funds to assist rent regulated properties improve their energy performance, including assistance on voluntary deep energy retrofit measures.

It has taken a number of years to get to this point where we have diverse groups converging to improve and support this ambitious endeavor. We thank the council for the leadership and cooperation it has demonstrated throughout this process as we work towards what will be a groundbreaking final bill.

Statement of
Donna De Costanzo
Director, Eastern Region, Climate and Clean Energy Program
Natural Resources Defense Council

Before the
New York City Council
December 4, 2018

Good morning, I am Donna De Costanzo, Eastern Regional Director for the Climate and Clean Energy Program of the Natural Resources Defense Council. Thank you for the opportunity to deliver testimony on the groundbreaking legislation before you today.

NRDC has been working in New York City on issues related to climate change and energy efficiency for decades, including working extensively with the City on the landmark Greener, Greater Buildings Plan and subsequent bills. In this era in which the Trump Administration has been waging a complete assault on the most fundamental clean energy and climate initiatives, New York City continues to be a critical leader, as action at the local and state levels is now more important than ever.

We fully support the Council moving forward with a framework to significantly reduce energy consumption in our buildings and look forward to working with the Council to advance Int. No. 1253 and improve upon it so that it is as effective as possible. To that end, we offer the following specific comments:

Flexibility:

We believe that energy efficiency should remain the focus of the legislation, particularly due to the many benefits associated with it beyond carbon reduction, including reduced energy bills, the creation of good, local jobs, the reduction of other harmful pollutants, and increased reliability of the grid. If options beyond efficiency may be used to meet the bill's requirements, particularly if a "building emissions intensity" metric is used, we recommend that the Council include parameters in the bill regarding how targets may be met.

Assuming that renewable energy may be used to meet the bill's targets, we urge the Council to only permit the use of renewable projects for purposes of compliance that are deliverable into the NYISO Zone J, thus only including local green power purchases, and to ensure that they are additive, and not duplicative, of other requirements.

In addition, we recommend that the Council adopt New York State's definition of renewable energy pertaining to its Clean Energy Standard, as the currently included definition of "Green Energy Source" may permit technologies that we don't consider to be renewable, such as municipal solid waste incineration.

Also, though we believe that there are specific, limited instances in which a variance from requirements may be warranted, the variance provisions currently included in the legislation are too broad and provide a significant amount of discretion to the DOB.

Requirements

We join others in voicing concern over the bill's blanket exemption of buildings with at least one rent-regulated unit. The City will not be able to achieve its greenhouse gas reduction goals with this exclusion. The exemption directly contradicts the conclusion made by the Mayor's Technical Working Group and reiterated by the Urban Green 80x50 Buildings Partnership report that in order to achieve citywide GHG reductions of 40 percent by 2030, buildings of all types and sizes must participate. With this exemption, the majority of the burden of meeting our emissions reduction goals from buildings will rest upon less than 40% of New York City's total building stock – and over a third of the GHG emissions that come from buildings over 25,000 square feet will not be addressed.

It is also important that these buildings and tenants get the benefits of energy efficiency. These are the buildings that often need energy efficiency upgrades the most and these are the tenants that would benefit most from lower energy and operating costs, and better functioning apartments. Of course, any framework including rent-regulated housing must protect against displacement and maintain affordability while advancing emissions reductions and energy efficiency.

Given the current concerns and challenges associated with Major Capital Improvements (MCIs), we recommend that rent regulated buildings that meet early compliance criteria be required to implement the low-cost prescriptive measures reflected in the Urban Green 80x50 Buildings Partnership recommendations, which would not trigger an MCI, for the early compliance period. We also believe that the Advisory Board created by this bill –with the addition of housing advocates – will be better equipped to address how rent-regulated buildings can participate, especially with the benefit of knowing how the Rent Stabilization Law will be addressed in Albany next year.

Regarding the early 2022-2023 compliance period, to address feasibility concerns while still achieving the City's emission reduction goals, we suggest that the Council consider briefly deferring the initial compliance period and staggering compliance, requiring the worst performers to cut their energy use or emissions by an established percentage instead of reaching an absolute target. We recommend that the Council focus on the largest buildings in an initial year, perhaps over 100,000 square feet, followed by buildings over 50,000 square feet in the second year.

In addition, we agree with the Council's intent to include a backstop that will ensure that we achieve our 40 x '30 greenhouse gas reduction target, but recommend reassessing the current structure to ensure that we achieve our goals in the most effective and sensible way possible.

Finally, we also strongly support the Council's efforts to establish a commercial PACE program, as included in Int. No. 1252, which will provide much-needed assistance to building owners for financing energy efficiency retrofits and other clean energy technologies. It is critical that the City, State and utilities integrate their efforts to the greatest extent possible to provide the financial and technical assistance that will be needed to meet the City's goals envisioned through this legislation, as well as the State's ambitious energy efficiency targets.

Once again, we thank Councilmember Constantinides, Speaker Johnson, and the Council for their leadership and stand ready to help improve and move forward this momentous bill that is not only critical for New York City's future, but will also serve as an important model for other cities around the country.

Testimony from ALIGN on Intro 1253

Brett Thomason, Climate Organizer

My name is Brett Thomason; I work for ALIGN: The Alliance for a Greater New York, and I coordinate our Climate Works for All Coalition. We represent environmental, climate justice, community and labor groups that have been collectively advocating for legislation just like intro 1253, for the past several years. This bill, if passed will be the single most significant thing the city can do to dramatically reduce its pollution at a pace and scale that has been called for by the Paris agreements. As you may know, almost 70% of the City's pollution comes from buildings, with nearly 30% of that coming from just 3% of its very largest buildings. We think it's well past time for the City to require the owners and operators of these buildings to clean up. There is no question that we know how to make these improvements and upgrades to buildings. Far too many New Yorkers suffer through heat waves in hot summer apartments or open their windows during the winter to counteract the effects of overheated units. With proper temperature controls, modern boilers, insulated pipes, new windows and insulated walls, we can dramatically increase the comfort of the places where we work and live and save millions of dollars on utility bills. We applaud the legislation's early timeline of 2022, that addresses the buildings with the "lowest hanging fruit:" those that have not undergone any upgrades or modernization. Making these efforts early will have immediate and profound implications for air quality and pollution reduction and be a big step forward for people who live in and around those buildings.

I want to highlight also that this legislation is not only good for the climate and good for our environment. It's also a huge win for the building and construction sector. Many of our coalition partners are labor unions that represent the hardworking women and men in the construction industry. A mandate to reduce pollution from buildings means thousands of high-paying jobs will be created every year upgrading buildings, floor to ceiling in order to make them more energy efficient. A bill like this is an investment in good, "green" jobs that protect our environment and help our communities thrive.

Finally, a word about housing and affordability: this legislation takes careful steps to ensure that tenants in rent-regulated housing do not have the cost of upgrades and improvements passed on to them in the form of MCIs. We know that rent law is set in Albany, so we have little control of it here in the city. Many of our partners and allies will be looking to reform housing policy in the coming legislative session, but until that time comes, then it is imperative that the Council keep buildings with rent-regulated housing on a separate compliance path. We do not want to see climate legislation pitted against affordability in one of the most expensive cities in the nation, where homelessness, wrongful eviction and rent burden are already rampant. We view this as a temporary solution; either until state law changes or until the City allocates some of its budget for energy efficiency in rent-regulated buildings. However, I would be remiss if I didn't point out that our organization, and many others, worked hard with the Urban Green Council, to put forth a recommendation by which these buildings could see energy efficiency improvements in the form of low-cost/no cost upgrades that wouldn't trigger MCIs. While we are supportive of any bill that doesn't trigger MCIs, we would prefer that the Urban Green's approach be used so that we are getting some improvements in all buildings.

In closing, this bill would represent groundbreaking, landmark legislation unlike no other that any city has taken. We are supportive because it dramatically reduces pollution at a pace and scale that the current climate crisis requires, while also creating thousands of good jobs while

protecting tenants from rent hikes and displacement. We urge the Council to pass this important legislation as quickly as possible, and look forward to New York implementing this ground-breaking policy to address climate change.

[For written testimony only]

We have serious concerns about the penalty amounts and enforcement measures as currently drafted in Intro 1253. As currently written, we think that it would be too easy for bad-actor owners to submit fraudulent reports with no consequence. There are multiple other arenas where landlords have proved themselves all too willing to fraudulently submit paperwork or reporting to skirt around regulation. We would propose that the newly created Office of Building Energy Performance be directed to perform a satisfactory number of audits per year so that owners have the reasonable expectation in any given year that their building energy report could be audited and verified by a government agency.

In regards to the penalties; we worry that at the current levels, they are too low to incentivize the energy efficiency work that the legislation is intended to encourage building owners to do. If the penalties do not compound after a year of non-compliance, than it will be too easy for building owners to write them off as the cost of doing business in the City and fail to deliver the public benefits that energy efficiency improvements on their buildings provide. We would suggest a compliance multiplier be added to the legislation, so that every year of noncompliance, the penalty doubles, and does not reset until a report is submitted that satisfies the given year's benchmark for efficiency gains.

Reducing Carbon Emissions by Eliminating Use of Tropical Woods on New York City Lands and by NYC Agencies and Public Benefit Corporations

Testimony of Tim Keating, Director, Rainforest Relief
P.O. Box 8451, Jersey City, NJ 07308 • 917/543-4064

12/4/18, Environmental Protection Committee, New York City Council

Dear Councilmembers,

Thank you for the opportunity to address the city's greenhouse gas emissions, in an effort to mitigate the fast-approaching, Civilization-induced changes in Earth's climate, due to increasing greenhouse gas emissions and increasing loss of mechanisms that reduce atmospheric greenhouse gases.

Rainforest Relief fully supports all efforts to reduce the use of fossil fuels by and in New York City. That includes for electricity and heat generation or for transportation of people and products.

Today, however, I would like to focus on another major cause of emissions that most often goes unseen and unsung, in which consumer countries' participation is less obvious and more complex, and therefore is easily ignored, but in which New York City participates in a major way. I'm referring to emissions from deforestation and forest degradation.

[Overall, emissions from the production and transport of the materials and products used by a city's governments, businesses and residences likely far outpaces the emissions from the burning of fossil fuels or other sources of emissions. Because procurement, extraction and initial production take place in other countries, end-users get to ignore responsibility for the resulting emissions. Yet, in a Capitalist system, both supply *and* demand are drivers of production. The relative weights of either end of that equation likely differ from product to product and material to material, but in general, who is responsible for the emissions from the production of, say, plastic bottles? The petroleum company? The country where the oil is drilled? The tanker company? The importing company? The chemical company? Or perhaps the store selling the thousands of 24-packs of bottled water? Or is it the 80+-year-old woman who, like my mother did, only trusted her water if it was from a bottle?]

More specifically, the primary factor leading to deforestation is the logging of high-value tropical hardwoods. So, how do we spread the accounting for the deforestation? Does is accrue to the illegal logger? The log buyer at the port? The ocean freight company? The US wholesale importer? Or is it the agency ordering the wood? Or even the engineer or architect who specified it in the project? We have always contended that those seeking and specifying products from other countries must at least share responsibility for the ensuing forest degradation, the resulting deforestation, the resulting species extinctions and the resulting greenhouse gas emissions.

Regardless of who is responsible, the emissions generated to extract or procure materials are often underreported and thus go unaddressed. For instance, estimates are that across the board, up to 80% of logging in the tropics is done illegally. Many countries underreport illegal logging for obvious reasons.

New York City is a major contributor to greenhouse gases from deforestation and forest degradation. I first became aware of the large-scale use of tropical hardwoods in New York City in 1994, when, as far as I was aware, I stood for the first time on the boardwalk in Coney Island. By then, Rainforest Relief had already staged campaigns in New Jersey targeting Atlantic City and Avon-by-the-Sea and was in the midst of a multi-month campaign in Ocean City. I moved into Brooklyn the next year and after another year of observation, I had concluded that the NYC city government was the single largest end-user of tropical hardwood in North America. Later, after years of travel to other cities, including in Europe and Asia, and communications with forest action groups around the world, by 2005 I had revised that assessment to conclude that NYC government agencies and public benefit corporations combined created the largest end-use of tropical hardwoods in the world outside of the tropics.

In order to give you a sense of the impact of the use of tropical hardwoods by and within the city, I first need to provide a bit of background regarding deforestation. I hope you can bear with me, as it is this information that I believe has been the stumbling block to enough understanding of the problem to compel people to take action.

According to the Environmental Defense Fund (EDF), 32 million acres of tropical rainforest — roughly an area the size of New York State — were cut down each year between 2000 and 2009 — that is, ten New Yorks in a decade. And the pace of deforestation is only increasing.

Before fully appreciating this number, it's important to understand the operating definition of "deforestation". The United Nations Food and Agriculture Organization defines deforestation as a clearing of 90% – 100% of tree cover. This distinction is critical, given that most forest impact does not include the complete clearing of forest cover. Destruction of tree cover of less than 90% is considered forest *degradation.* For the last three decades, almost every analysis of the contribution of forest clearing to greenhouse gas emissions has only considered deforestation. In their 1995 State of the World's Forests, UNFAO charted the factors contributing to deforestation and only made mention that 70% of deforestation due directly to agriculture clearing was *precipitated by the existence of logging roads.* It was this paragraph that prompted Rainforest Relief to redraw the pie chart, with logging's contribution doubled.

Flipping the UNFAO data around, World Resources Institute showed that, globally, *a logged forest in the tropics was eight times more likely to be completely deforested than one remaining unlogged.*

Yet, this degradation went unreported, since it simply did not show up on satellite imagery. Only in 1995 did Dr. Daniel Nepstad and colleagues ground-truth satellite images with on-the-ground analysis. He concluded that UNFAO's numbers for deforestation should be doubled to include degradation.

In 2005, Dr. Gregory Asner and colleagues a the Carnegie Institution for Science developed a satellite image analysis system designed specifically to map large-scale forest degradation, especially from many types of selective logging. This system was used to map transitions between selective logging activities and full clear-cutting, showing that logged forests in the Amazon are *400% more likely to be completely cleared than unlogged forests.*

In a conversation with Dr. Nepstad in 2015, I asked if he believed degradation had yet been included in calculations of greenhouse gas emissions from forest destruction. His answer was that he did not.

More recent studies have revealed that not only does degradation precipitate deforestation, it is itself is a major source of emissions. In one study by scientists at Winrock International, they concluded that degradation makes up 25% of emissions from total forest destruction. That is, itself, a larger source of GHGs than international air travel, global shipping or waste management. But another study by scientists at

Woods Hole Research Institute concluded that degradation is actually a greater source of emissions than deforestation, around 60% of the combined total.

While not much can be done for the last of these, actions can and should be taken to eliminate the use of tropical hardwoods and temperate rainforest woods by city agencies; state-organized PBCs acting within NYC; and for any projects done on city-owned property.

This would quickly and permanently reduce the emissions of large amounts of greenhouse gases for which the city is at least partly responsible.

[In 1992, legislation passed in New York State to regulate the use of tropical hardwoods by state agencies (including public benefit corporations). As is often the case, this law included all 'sub-central' governments in the state (that is, municipalities), which is often the way laws happen in the state. While this might at first appear to have solved the problem, this also meant that municipalities were precluded from passing stricter laws on this issue. Had the state bill be comprehensive, this would have solved the problem for NYC. However, in moving towards passage, the only people the sponsors heard from were lobbyists from the tropical wood importing association, and to appease them, the bill was weakened. In the original bill, the definition of tropical hardwoods was "any and all hardwood originating from between the Tropics of Cancer and Capricorn". A list of common tropical hardwoods in trade at the time was also included, as a convenience. Because of opposition, a single phrase was changed ("tropical hardwoods shall include, but not be limited to, the following:" became "tropical hardwoods shall be the following:", whereby the exemplary list became the list of banned species, ignoring the other definition. As well, by request, plywood was exempted.

For the agencies in the state, even at the time, the most-heavily used species weren't on the list, which was compiled by a California-based non-profit.]

After 13 years of campaigning by Rainforest Relief, NYC Parks finally concluded that recycled plastic lumber was working best of all materials for benches, and a year later stated an end to the use of tropical hardwoods for new benches and boardwalks. But NYC DOT continues to use greenheart, from Guyana, for pilings (thousands of which are used in the Staten Island Ferry terminal fenders alone, and the decking of the Brooklyn Bridge Promenade; MTA/NYCT continues to use ekki for miles of subway track ties, and public benefit corporations such as NYEDC, Hudson River Park Conservancy, The Battery Conservancy; for-profit companies such as Howard Hughes Corporation, which now manages South Street Seaport, continue to skirt Mayor Bloomberg's policy initiative to reduce the use of tropical hardwoods

It is time for the Council to end New York City's participation in the destruction of tropical forests and the resulting greenhouse gas emissions.

I look forward to working with any councilmembers who are interested in closing the loopholes that allow a parade of hundreds of shipments of rainforest wood to be used in NYC and for NYC infrastructure.

Thank you.

Tim Keating, Director

Rainforest Relief, 917/543-4064

Testimony by John Mandyck
CEO, Urban Green Council
Before the New York City Council Committee on Environmental Protection
Re: Intros 1251, 1252 and 1253

December 4, 2018

Mr. Chairman, members of the committee, my name is John Mandyck and I am pleased to deliver this testimony as CEO of Urban Green Council. Russell Unger is out of town on a previously scheduled trip, or otherwise would have joined me.

Urban Green is a multi-stakeholder non-profit organization dedicated to transforming New York City buildings for a sustainable future. We do this by convening experts on our most critical issues, by providing research that informs policy and drives national conversations, by working with you and your colleagues in government to advocate for needed policy solutions, and by providing knowledge and training to support the 21st century green economy in New York and 13 cities in the U.S, and Canada.

The Blueprint for Efficiency that we delivered to you this fall represents the best of Urban Green. Over the course of eight months and 85 meetings, we convened the 80x50 Buildings Partnership, which includes 70 experts from 40 diverse organizations. We arrived at 21 actionable recommendations for building efficiency that will deliver the largest carbon reduction in the history of New York City.

The Blueprint represents the shared thinking of the city's major building and environmental stakeholders.

When we convened our partners last year, the outcome was completely uncertain. We didn't know if the parties would come. We didn't know if workable ideas could surface. We didn't know if consensus was possible. We didn't know if the outcome would matter to policymakers.

Almost a year later, we're at a hearing where the Blueprint for Efficiency serves as the basis for historic legislation. That happened because those that rarely agreed came together to find a better way. That shared thinking is powerful and it's the essential ingredient that has been missing in most global climate policy debates. But not here. Not now. So Urban Green thanks the 40 organizations in the Buildings Partnership that make this day possible.

Urban Green Council
U. S. Green
Building Council
New York

55 Broad Street
9th Floor
New York, NY 10004

Phone (212) 514-9385
Fax (212) 487-9504
urbangreencouncil.org

We also thank the Mayor who rightly started this conversation and we thank you Mr. Chairman for your continued leadership with landmark legislation for our sustainable future. We also thank Speaker Corey Johnson and the other co-sponsors of this critical bill.

Buildings are the answer to our low-carbon future. They are the single largest source of our carbon emissions. So, the future of sustainability and the future of buildings clearly go hand in hand. Globally, buildings consume about 30 percent of energy, nationally buildings consume 40 percent of energy, but in New York City, buildings consume nearly 80 percent of energy.

We'll never get to our 80x50 requirements without workable policies that lower the energy consumption of our existing buildings. That's exactly what the Blueprint for Efficiency delivers: a 20 percent reduction in energy use for 50,000 of our largest buildings between 2020 and 2030.

We're grateful, Mr. Chairman, that the bill before us represents many of the Blueprint's elements, including a process for creating a new building performance metric, a new office of building energy performance, a strong and representative stakeholder advisory board, and a program for assisting building owners. And we strongly support the collective aim of an effective and long-term building emissions reduction policy.

But we have more work to do for the legislation to include all elements of the Blueprint and the careful balance that was reached among all parties of the Buildings Partnership. We pledge to work with you, your colleagues, and members of the Buildings Partnership to make that happen.

With that goal in mind, the following are Urban Green Council's key areas of concern, which also represent the priorities of many members of the Buildings Partnership:

1. **The proposed early requirements are not feasible in present form.**

   Requirements that would necessitate significant capital improvements in a short period of time are not feasible, in part because of the time required for planning, financing, implementing, and assessing building upgrades.

   Moreover, a policy based on an energy or emissions metric must account for the significant variety of factors influencing energy use (and thus carbon emissions) in large NYC buildings, such as hours of operation, density, and type of activity. A metric based only on building area and occupancy classification is inadequate, as it will not reliably identify wasteful or inefficient buildings.

Given these concerns, the proposed approach for early requirements starting in 2022 is unfeasible in its present form. Members of the Partnership believe there are alternative, more practicable approaches to delivering energy and carbon reductions in the early 2020s. While we have not yet agreed on any particular path, options include requirements based on percentage reductions or on the existing Energy Star metric (which accounts for factors like operating hours). For greater flexibility, owners could have the option of choosing their own path.

2. **The proposed backstop is not feasible in present form.**

Default requirements must reflect a feasible timeline and stringency. The proposed default emissions intensity requirements starting in 2024 would necessitate major upgrades in tens of thousands of large buildings over four years. These requirements would drive massive cost inflation and result in a large proportion of buildings falling short. Also, the stringency of the proposed backstop targets is based on incomplete data, since we don't yet have benchmarking information for buildings between 25,000 and 50,000 square feet.

These default provisions may also be unnecessary. The legislated mandate for the Department of Buildings to develop a workable metric and building performance requirements, based on advice of the newly created advisory committee is legally enforceable. Setting detailed and attainable building-level default requirements will require significant time and effort – time that could take away from other elements of what's already a highly intricate policy.

If the goal of the default requirements is to ensure a minimum level of reductions, sector-level energy or emissions targets are preferable. This is the approach in the Blueprint for Efficiency, which proposed a 20 percent source energy reduction for each major building sector.

It remains critical to send a long-term signal to the market so building owners integrate energy efficiency into capital planning as soon as possible. Potential means to achieve that end include:

- Accelerating the schedule for development of the new metric and associated building-level targets;
- Coupling sector-level targets with example retrofit pathways for typical buildings; and
- Amending the audit and retrocommissioning law to provide an option for owners to submit a capital plan instead of an audit for the second compliance cycle.

3. **Building owners need support and flexibility for successful implementation.**

Successful and cost-effective implementation of widescale emissions reductions depends on government support for owners. The inclusion of a program for assistance to owners and the creation of a sustainable energy (PACE) loan program are strong steps in the right direction. Further developing the plan for government support must remain a priority, including targeted subsidies for nonprofit organizations.

Flexibility in compliance is also critical for successful implementation. As recommended in the Blueprint for Efficiency, the policy should include a requirement to develop a compliance option based on efficiency or emissions trading, on the condition that initial study demonstrates such a program is feasible, effective, and reflective of environmental justice concerns.

Addressing regulatory barriers to energy efficiency will also make emissions reductions easier and less costly for owners. The Blueprint for Efficiency includes several recommendations to achieve this end that should be reflected in Intro 1253 or companion bills, such as removing the month of May from the heating season, streamlining façade inspections, and requiring the city to study ways to facilitate access to tenant spaces for legitimate efficiency upgrades.

4. **Buildings with rent-regulated units can't be left behind.**

Buildings with at least one rent-stabilized or rent-controlled unit make up about 40 percent of large multifamily building area. The proposed full exemption of these buildings would be a major barrier to climate progress.

Based on the consensus approach in the Blueprint for Efficiency, requirements for this sector should include energy conservation measures that do not qualify for rent increases based on Major Capital Improvements (MCIs). That means including measures beyond those in the audit and retrocommissioning law, such as installation of radiator temperature control valves, replacement of steam traps, upgrading master vents, or installation of radiant barriers behind radiators.

The bill should also include a provision to adjust requirements for rent-regulated buildings if the current MCI regime changes substantially.

5. **Building energy grades should come after the development of the new metric.**

The energy performance bill proposes development of a new building performance metric tailored to New York City buildings. The existing energy grades law (Local Law 33 of 2018) should be amended to take effect after this new metric is created,

and to utilize this same metric as the basis of the energy grades. This will ensure consistency across the city's building energy requirements.

Removing my Buildings Partnership hat and speaking for Urban Green, I'll conclude with a few thoughts:

This legislation is critical to reaching our 80x50 mandate. And reaching 80x50 is necessary to demonstrate New York City's climate leadership. We have a lot at stake: New York State has $3 trillion of insured coastal properties – including New York City homes, apartments, shops and office buildings – more than any other state in the country. Yet when we reach 80x50, the effects of climate change and the devasting impact of rising waters in New York harbor will still occur if other cities around the world do not follow.

For others to do so, we need public policies that both work in New York and are exportable around the world. That's our best shot to save our city from the worst impacts of climate change.

Based on my prior 25-year buildings industry experience working in 53 countries, the Blueprint offers at least two policies that are scalable globally:

1. First is the manner by which we propose to measure building energy efficiency. Measuring efficiency sounds straightforward, but in its implementation we've often seen that the "one size fits most" approach doesn't work. Buildings that have high occupant density, trading floors and data centers are generally measured the same as buildings of identical size but with big office suites, lower density characteristics, and shorter operating hours. We have to measure buildings practically as they function, and that's exactly what the Blueprint proposes. Our recipe can work in other cities.

2. Second is the proposal to trade energy efficiency credits among buildings. This would be a first in the world at the scale we propose. In its simplest terms, we call for a 20 percent reduction in building energy use. If Building A achieves a 30 percent reduction but Building B can only reach 10 percent, Building B should be able to buy the extra 10 percent from Building A. The environmental benefit is the same because 20 percent would still be achieved overall.

   To retrofit 50,000 buildings in an unprecedented 10 years, we need flexible policies and mechanisms like efficiency trading to get there.

   And, to unlock efficiencies in residential buildings, where the largest share – 44 percent – of energy is used in New York City, we need new sources of capital that efficiency trading can provide to update aging mechanical and lighting systems. One could imagine, for example, energy services companies completing those upgrades

in residential buildings – on their own dime – in order to trade the efficiency credit.

Some stakeholders have voiced caution on trading systems in general, especially concerns about potential impacts on low-income communities, such as market mechanisms that could lead to underinvesting in these communities. But what if we gave higher credit in affordable housing or priority neighborhoods versus commercial properties to encourage the direct benefit in those neighborhoods? Good policy design can answer the concerns we hear.

We have the world's trading expertise right here in New York City to get this right. And when we do get it right, it is immediately exportable to cities around the country and around the world, with Urban Green ready to help scale the solution.

Today's legislation isn't just about how we get to 80x50, it has to also be about how we provide policy tools that can work far beyond New York. That's our best shot to stem the rising tide in New York harbor.

Mr. Chairman, your leadership and that of the committee will be crucial. We thank you for your focus. We thank you for this moment. Urban Green looks forward to working closely with you to incorporate all aspects of our consensus-based Blueprint for Efficiency into your legislation.

Sincerely,

John Mandyck
Chief Executive Officer
Urban Green Council

Appendix

Summary Table of Issues and Recommendations

Issue	Recommendation
The proposed early (2022) requirements are not feasible in present form because they do not account for the significant variety of factors influencing energy use, such as operating hours, density, and type of activity. They would also necessitate significant capital improvements in many buildings in an unreasonably short period of time.	Develop a different, more practicable approach to deliver energy and carbon reductions in the early 2020s. Options include requirements based on percentage reductions in energy use or on the existing Energy Star metric (which accounts for factors like operating hours). For greater flexibility, owners could have the option of choosing from multiple compliance paths.
The proposed backstop is not feasible in present form because it does not reflect a feasible timeline and stringency and is based on incomplete data. The proposed requirements would drive massive cost inflation and result in a large proportion of buildings falling short.	To ensure a minimum level of reductions, set sector-level energy or emissions targets as recommended in the Blueprint for Efficiency (20 percent energy reductions by 2030). To send a long-term signal to building owners to integrate energy efficiency into capital planning as soon as possible, consider: • Accelerating the schedule for development of the new metric and associated building-level targets; • Coupling sector-level targets with example retrofit pathways for typical buildings; and • Amending the audit and retrocommissioning law to provide an option for owners to submit a capital plan instead of an audit for the second compliance cycle.
Successful implementation depends on support for building owners and flexibility in compliance.	As detailed in the Blueprint for Efficiency: • Ensure that developing the plan for government support remains a priority, including targeted subsidies for nonprofit organizations; • Require development of a compliance option based on efficiency or emissions credit trading, conditioned on a study demonstrating such a program is feasible, effective, and reflective of environmental justice concerns; and • Address existing regulatory barriers to energy efficiency, including by removing May from

	the heating season, streamlining façade inspections, and studying ways to facilitate access to tenant spaces for efficiency upgrades.
Excluding buildings with rent-regulated units from the legislation represents a major barrier to climate progress and will leave these buildings behind.	As detailed in the Blueprint for Efficiency, requirements for this sector should include energy conservation measures that do not qualify for rent increases based on Major Capital Improvements (MCIs), such as installation of radiator temperature control valves, replacement of steam traps, upgrading master vents, or installation of radiant barriers behind radiators. The bill should also include a provision to adjust requirements for rent-regulated buildings if the current MCI regime changes substantially.
The city's building energy grade law is based on Energy Star, while Intro 1253 contemplates the development of a new building performance metric, creating the potential for substantial confusion around two different building performance programs.	Amend the existing energy grades law to take effect after the creation of the new metric, utilizing the new metric to ensure consistency across the city's building energy requirements.

Testimonio Petra Luna (2)

Buenas tardes,

Gracias a todos por estar aquí para levantarnos por Clima, Empleo y Justicia!

Mi nombre es Petra Luna y soy miembro en Se Hace Camino Nueva York.

Estoy aquí hoy en una lucha personal y colectiva. Soy una madre inmigrante con dos hijos y he pasado los últimos 20 años viviendo y creciendo en Bushwick, Brooklyn.

Mis hijos, Christian y Jason, han pasado la mayoría de sus vidas sufriendo de asma crónica que ha obstaculizado sus vidas.

< Saque y muestre el inhalador >

Para mi familia este inhalador significa poder respirar. Y eso es vivir, o vida, por ahora.

Cuando nosotros inhalamos, sentimos el cuerpo tembloroso, dolor de cabeza, calambres musculares y palpitaciones del corazon. En otras palabras, lo que nos ayuda ahora nos enfermara en el futuro.

Mi historia no es única. De hecho, esta ciudad ha producido muchas desigualdades. Donde hay altas tazas de pobreza y desempleo tambien hay altas tazas de malas condiciones de salud.

Mi propia comunidad de Bushwick es un ejemplo. Bushwick esta por encima del promedio de la Ciudad en defectos de mantenimiento de la vivienda, contaminación del aire, obesidad, diabetes, derrames cerebrales y asma.

Esto es injusto para nuestras familias y estamos aqui para exigir que "la Ciudad" trabaje para darle solucion.

Hoy luchamos porque creemos que los resultados de salud de nuestros ninos no debería ser determinado por nuestros ingresos.

Si vamos a transformar esta ciudad y hacerla más equitativa y sostenible, debemos comenzar por escuchar las voces de esta multitud.

Transformar esta ciudad significa aprobar legislaciónes que reequipen los grandes edificios en los cuales su consumo de energía hace que nuestro clima sea más cálido y que el aire sea menos saludable para respirar.

Transformar esta ciudad significa llevar nuestro MTA al siglo XXI al hacer que nuestras infraestructuras de tránsito estén mejor preparadas para grandes tormentas y cambiar a una flota de autobuses eléctricos.

Estas son algunas ideas por las cuales nos levantamos. Tenemos soluciones, para el Clima, Empleo y Justicia. Ahora necesitamos que los líderes electos hagan su trabajo.

Gracias!

NYU Government Affairs

Government Affairs
25 West 4th Street
New York, NY, 10012
P: 212 998 2400
government.affairs@nyu.edu

Testimony of Cecil Scheib
Assistant Vice President for Sustainability, New York University
before
New York City Council Committee on Environmental Protection

December 4, 2018

Good morning Chairman Constantinides, and fellow Council Members. My name is Cecil Scheib and I am the Assistant Vice President for Sustainability at NYU. I appreciate the opportunity to testify before you today as you consider legislation on the reduction in greenhouse gas emissions in the City's buildings.

At NYU, we are committed to making the University one of the nation's greenest campuses and have launched renewed effort to achieve this goal. Since 2007, NYU has reduced its emissions by 30% - an amount equivalent to planting enough trees to cover all of Manhattan, and all of Brooklyn, in forest. We have pledged to achieve a 50% reduction from the baseline by 2025 and carbon neutrality by 2040. This reduction in emissions is something the University has voluntarily undertaken not only because we believe it is part of NYU's role as an anchor institution in New York but also because it positively impacts our community. We support the City's strong leadership in addressing existing buildings, the principal source of NYC carbon emissions, as it will take a concerted and collective effort across the city to effectively combat climate change.

NYU has proven deep carbon reductions are possible. In 2014 we renovated Brittany Hall, a student residence on Broadway at East 10th Street. During the process we removed heavy #4 fuel oil boilers from the basement, a big source of unhealthy airborne particulates, and replaced them with light natural gas boilers on the roof, far from any potential flood risk. They are ready to be replaced with electric heat pumps when required. In all, we reduced fossil fuel needs for heating needs by 81%. That's right – not 8% - not 18% - 81%. It is not a passive house project – just run of the mill engineering. Reasonable efforts can achieve deep results.

And it's affordable. Brittany Hall cut its operating costs in half as a result of the renovation. At 370 Jay Street, the old MTA headquarters in downtown Brooklyn that the University is currently renovating and which just received LEED Platinum, we actually saved capital costs by retaining the existing façade (another carbon benefit) and air sealing it instead of replacing it. In all, our 30% carbon reductions are saving about $15 million per year, and just about everything we did had a 1-4 year payback. We believe sustainability is good business practice for NYU.

NYU | Government Affairs

Government Affairs
25 West 4th Street
New York, NY, 10012
P: 212 998 2400
government.affairs@nyu.edu

To achieve carbon neutrality, we must achieve deep energy reductions in our buildings as over 90% of NYU's energy consumption is building related. Electrifying energy uses, replacing the use of fossil fuels, gives us the opportunity to buy clean and renewable energy to reach our 2040 goal. But as bold as this goal may be, we believe that the health, comfort, and productivity benefits of this effort will outweigh the energy savings.

Medical studies show that cognitive function doubles in offices with better indoor air quality. But the same issues that cause poor air quality – old drafty buildings (a key issue for us as 60% of NYU's space is more than 50 years old) – also cause energy wastage and high carbon emissions as we heat and cool air that is immediately lost through drafts. The things we will do to save energy in these buildings will also help people think more clearly, which is our mission. In addition to our carbon goals, we have committed resources to ensure that every significant construction project NYU undertakes will be LEED certified, targeting Silver certification as a minimum, to ensure the health and comfort of our students, faculty, staff and administrators as well as lowering carbon emissions. Projects certified and undergoing certification account for over 2 million square feet of LEED space in Manhattan and Brooklyn – including three rated Platinum. Our message is not that we must reduce carbon for the good of the planet. Our message is that we will enhance NYU's academic mission by providing comfortable and healthy spaces that enhance NYU's excellence, and that the energy savings will help pay for it – and we'll achieve our carbon goals, too.

We are pleased that the City Council is taking up this important issue of emissions reductions in the City's buildings and support the efforts of this legislation. A key item is setting the actual carbon targets and metrics appropriately for each building group and within each building group. NYU has performed building energy data analysis for the City for years, including its annual reports on energy use and carbon emissions. We are already using our expertise to help the City set targets and metrics that are appropriate, meaningful, contextual, and nuanced, so that carbon reductions are both impactful and achievable. We are happy to offer our assistance to the City as this work proceeds.

In addition, NYU routinely and actively engages with the City on analysis of climate policy from a legal perspective, be it that of owners or climate justice. As it is essential that portfolio owners be freed to align work with capital cycles so that they may cost-effectively do deep energy retrofits when other work is already planned, as well as support energy efficiency in traditionally underserved building types, as the carbon trading study commences, we would also offer our assistance in that area as well.

NYU hopes to continue to partner with the City Council as we work to make New York more sustainable and reduce the impacts of climate change on our City. Thank you again for the opportunity to testify again and I welcome any questions you have.

Testimony of Adriana Espinoza
New York City Program Director
New York League of Conservation Voters
City Council Committee on Environmental Protection
December 4th, 2018

Good morning. My name is Adriana Espinoza, and I'm the Director of the New York City Program at the New York League of Conservation Voters (NYLCV). NYLCV represents over 30,000 members in New York City and we are committed to advancing a sustainability agenda that will make our people, our neighborhoods, and our economy healthier and more resilient. I would like thank Chair Constantinides for the opportunity to testify before the Committee on Environmental Protection regarding Intros 1252 and 1253 of 2018.

The time to act on climate is now. The most recent Intergovernmental Panel on Climate Change report and the Fourth National Climate Assessment make it clear that we must make radical changes in short order to avoid catastrophic climate change. Reducing emissions from buildings - NYC's #1 contributor to carbon pollution - is the single most significant step the City can take. Establishing enforceable building emission reduction targets will help ensure that the residential and commercial sectors do their part to fight climate change and protect our environment. For that reason, NYLCV applauds the City Council for taking up this issue.

New York City is a national leader on energy and climate. Other municipalities will look to us to replicate their own policies on energy efficiency in buildings. We urge the Council to be thorough and deliberative with what NYLCV sees as the most significant piece of environmental policy taken up by the New York City Council in years.

Intro 1253 is a great start. The framework of the bill is solid, and we especially appreciate the inclusion of a backstop to reach reductions of 40x30 in case of inaction by the bill's advisory group. NYLCV also strongly supports Intro 1252, which establishes a PACE program to provide much needed assistance to finance energy efficiency retrofits and other clean energy upgrades. It is imperative that Intros 1252 and 1253 pass as a package.

The legislation can be improved by making some additional changes. We respectfully submit the following comments and recommendations:

Timeline:
While we need aggressive action, it is unclear whether the first compliance deadline of 2022-2023 is technically feasible as currently written, and the metric used ("building emissions intensity") is flawed. It does not take into account building usage or occupancy. Further, since future deadlines in the bill will target reductions using a NYC-specific metric that doesn't currently exist, it would be overly complicated and burdensome for building owners to be required to reduce energy using

"building emissions intensity" in 2022-2023 and then a completely separate metric from 2029-2050.

Instead of requiring all covered buildings to meet an absolute target, the early deadline should target the worst polluters. The worst 10% of performers, as determined by benchmarking from Local Law 87, should be required to reduce energy use by an established percentage. We also urge the City Council to consider deferring the initial compliance period slightly and staggering compliance by building size. Given that benchmarking for buildings 25,000-50,00 square feet will not begin until this bill passes, these buildings should be on a different timeline than buildings who have baselines long established by LL87.

Exemptions and Variances:

We share the concern over Intro 1253's exemption of all buildings with at least one rent-regulated unit. Simply put, we cannot achieve our climate goals with this exclusion. At the same time, NYLCV understands that achieving these goals should not exacerbate the affordable housing crisis in NYC. Any framework that includes rent-regulated housing should protect against displacement.

While we are fully supportive of the bill's expansion of LL87 to require all buildings over 25,000 sq ft (including rent regulated buildings) to do energy audits and retro-commissioning, it is clear from buildings already subject to LL87 that this alone will not lead to significant adoption of energy efficiency measures. By some estimates, the exclusion of rent regulated buildings will leave *over a third of all greenhouse gas emissions* from buildings over 25,000 square feet unaddressed.

More importantly, just as we cannot make these upgrades on the backs of low-income New Yorkers, we also cannot leave these tenants behind. It is likely that these buildings and the New Yorkers living in them are those that could benefit the most from energy efficiency upgrades.

Given these concerns, NYLCV recommends that rent-regulated buildings that meet the early compliance criteria be required to implement the prescriptive measures developed by the Urban Green 80x50 Buildings Partnership during the early compliance period. These low-cost upgrades should be included in the bill explicitly, as research and analysis by the Partnership has determined these upgrades will not trigger a Major Capital Improvement (MCI) rent increase.

Assistance, Outreach, and Training:

The City Council should take every opportunity to capitalize on the green jobs potential of these bills. In addition to outreach and education for building owners, outreach and training opportunities for design professionals and building maintenance and operations staff should be

Testimony of Adriana Espinoza
New York City Program Director
New York League of Conservation Voters

included. This is especially critical for operations and maintenance staff, who will be responsible for implementing and overseeing new building energy systems. Investing in their training can make a sizeable difference maximizing energy savings.

On behalf of NYLCV, I'd like to thank Council Member Constantinides and Speaker Johnson for your leadership on advancing this legislation and the Council's commitment to NYC's environment and the fight against climate change. We look forward to working with you and your Council colleagues through this legislative process to maximize the potential of this package of legislation.

Testimony of New York Communities for Change (NYCC) to the NYC Council Committee on Environmental Protection

December 4th, 2018

Testifiers: Rachel Rivera, Cynthia Norris and Pete Sikora

1st NYCC testifier:

My name is Rachel Rivera. I am a board member of New York Communities for Change. We are a community organization which promotes economic, racial and climate justice.

We are thrilled with this legislation. We want to thank Chair Constantinides, Speaker Johnson and the co-sponsors and supporters in the Council.

It's simple: unless the world radically slashes climate pollution, New York City will cook while slowly slipping under water and drowning, while we get hit by extreme weather such as hurricanes, heat waves, intense rain and flooding.

I can tell you the consequences first hand.

I was in my apartment with my little daughter during Sandy. She was sleeping when I heard a loud crack from the roof. I grabbed her out of her bed and right after that the roof came down onto her bed.

We ran out into the night with nothing. We then spent time in emergency shelter. We were homeless. My daughter still has nightmares and serious anxiety problems stemming from the storm. She often becomes hysterical when it rains. She has been hospitalized as a result.

My family lives in Puerto Rico. During Maria, my mother and aunt's homes were flooded and they lost everything. A close family friend was killed by the storm.

These climate disasters are fueled by the pollution this city's buildings pump out every single day.

New York City gives off about 50 million metric tons of climate pollution each year. About 70% comes from buildings. About HALF of that comes from the buildings covered by this bill. Those are just 2% of the city's real estate, about 5% of the buildings, but it's that much pollution.

Donald Trump's building, Trump Tower, is one of the most inefficient big buildings in the city. So is Kushner's 666 Fifth Avenue. So is that billionaire pencil tower, One57. So is 15 Central Park West, where Goldman Sach's CEO lives. These super-luxury buildings are super polluters.

It's time they cleaned up their acts, along with every other large building.

My families experience is living proof of the damage of climate change. The climate crisis is here and now. New York City cannot survive on the world's current path of climate polliution. And it can't survive with pollution cuts less than this bill would set into law.

That's why we are so happy to see legislation that doesn't just tinker around with the issue: it sets pollution cuts at the level needed. That's what the scientists tell us is needed. That's what needs to be done.

Period.

2nd NYCC Testifier:

My name is Cynthia Norris. I'm also with NYCC.

I have asthma. It's a serious health condition. I have to use an inhaler and occasionally I can't breathe properly.

I don't know if you've ever had an asthma attack. Let me tell you: it's scary as hell. You can't get enough air into your lungs. You pray that you will survive.

The pollution getting pumped into the air by the city's buildings is a big problem for me. It's not the only reason I have asthma, but cutting fossil fuel use will help clean the air, cutting smog.

My asthma is also worse on hot days when the smog gets worse. It's those days when the air gets so thick even people without a condition can feel it. It's worse for me.

Climate change means many more hot days for New York City if the City and other places worldwide don't pass laws like this one.

The scientists tell us that New York City has about 20 days a year of over 90 degree heat. By 2050, they project that will go up to about 55 days per year. Two whole months of miserable, sticky, humid very hot weather.

It's a real health threat to me. This legislation will help stop it.

I also want to say that climate change is already hitting low income and communities of color the worst. We can't afford to run air conditioning all day. We don't have the money to just pay for everything new when something like Sandy comes along. I don't even want to think about how much worse this will all be with 5-10 feet of the sea level rising and the heat so much worse.

You know, we deal with racism and the inequality of the system every day.

Climate change puts all those bad effects on steroids.

This law, if you pass it, is serious. It's not one of those laws politicians make a big deal out of. I think it will make these dirty buildings clean up. In the coming years, it will have a meaningful impact on my life. I'll be able to feel the difference.

That is why we are very happy to see this. Thank you to Environmental Committee Chair Constantinides, Speaker Johnson and all the Councilmembers who are helping.

Please pass this law now.

3rd NYCC Testifier:

My name is Pete Sikora and I'm also with NYCC. NYCC is also a member of the Climate Works for All coalition, which has pushed for this type of legislation.

Intro 1253 is a Green New Deal for New York City. It creates thousands of good jobs each year to clean up our city, slashing pollution from large buildings by over 80%.

It will also not cause rent hikes in rent-regulated housing.

Specifically, Intro 1253 will cut climate pollution by about 40% by 2030 if all the covered buildings comply. It will reach over 80% cuts by 2050 in combination with a greening electric grid. These cuts start in 2022 for the most inefficient, polluting buildings.

These pollution cuts are at the speed and depth of the Paris agreement, which the city is committed to achieving. It tracks with the United Nation's IPCC report. It also follows city law to slash pollution over 80% by 2050. It makes real the Bloomberg Administration's PlanNYC and the de Blasio Administration's OneNYC plan, which both acknowledge the need for cutting pollution at this level, but did not specify any legislation or requirements.

Now, it's real.

This law, a Green New Deal, means thousands of good, green jobs. Getting buildings upgrades and cleaned-up will take many workers in design, renovation and construction. The experts we work with estimate that this type of legislation will create thousands of jobs each year. Many of these jobs will be good, union jobs hiring from the city's communities of color.

These are career-track positions that can support a family. They are sustainable, green jobs that won't go away, because this work will take decades, and the work can't be outsourced or sent offshore.

This legislation is also a worldwide model, a moment for New York City to step up and lead the world.

About 70% of climate pollution worldwide comes from cities. The top source of many cities pollution, as in New York, is energy use in buildings. New York City is now on the verge of leading the world by proposing the first comprehensive standards on big buildings that will achieve the cuts needed to stave off the worst of the climate crisis.

With Trump in office, this legislation rises to the challenge of the climate crisis, where the federal government is destroying the progress the world needs at the exact moment when there's no time left.

The world will be watching this bill. The world's cities will see New York's action. It will be a model for bold action worldwide that is at the scale of the climate crisis, and also creates many good jobs. It's a model for the world.

I can answer any questions you may have on our views, in particular on the impact on rent-regulation and those buildings – and our views with respect to such affordable housing.

We thank Chair Constantinides, and the Councilmembers that supported our principles and Speaker Johnson for their response to the challenge of our time.

[further remarks will not be delivered verbally and will be submitted as written testimony]

Rent Regulation:

Also, let me speak in some detail to rent regulation. First, we commend the Council for recognizing that it's simply wrong to pit housing affordability against pollution cuts. In a city with about 70,000 people in shelters every night, where almost half of renters pay half of their income in rent, and 1 in 10 public school kids are homeless at some point in the year, it would be a moral abomination to pass energy efficiency legislation that would raise rents, fuel displacement, and lead to deregulation of regulated, affordable apartments.

The City does not control the rent laws in regulated housing, just as it does not control tailpipe pollution from cars. Until state law is changed, energy efficiency requirements that require major capital improvements lead directly to permanent rent hikes for tenants, while landlords pocket the savings from paying less for energy.

We support this legislation as proposed because it is strong on pollution cuts and job creation, while not causing rent hikes in regulated housing. Applying retro-comissioning and auditing requirements as in this bill to rent regulated buildings between 25,000 and 50,000 square feet leads to energy savings without causing rent hikes.

However, we also believe this bill's provisions with respect to rent regulation could be improved. Intro 1253 should be amended to require rent regulated buildings to undertake the

work called for in the Urban Green Council's 80x50 Buildings Partnership recommendations. Those requirements generate larger energy use reductions than retro-commissioning and auditing because they would require sensors and thermostatic radiator valves, among other items.

MCIs are a tricky issue because it is impossible to know with precision what may qualify as an MCI. That decision is left under current state law to future regulators and courts whose opinions today do not guarantee any results tomorrow. Moreover, landlords are willing to charge MCIs even when it isn't clear they are justifiable legally. Tenants often do not understand their rights or are unwilling or afraid to take their landlord to court to stop an MCI.

Nonetheless, on balance we believe that the UGC's recommendations, which we helped to shape on this issue, strike a proper balance. They are low cost items. As a result, even if a landlord tried to get an MCI and they are ruled as MCIs by regulators and courts, the cost would not be unduly burdensome. Meanwhile tenants benefit from such valves and sensors because they improve comfort at a low cost. They also can protect against landlords unwilling to provide enough heat, because sensors record temperatures and provide evidence.

In terms of the straight math, here are two examples: a thermostatic radiator valve costs $100. If that were charged as an MCI, it would lead to a $100 *1/96 = $1 per month rent hike. Let's say sensors and boiler controls cost $500 per apartment. Then the MCI hike would be $500 * 1/96 = $5 per month. While poor people need to save every dollar, we believe that these items should not be considered MCIs by regulators and courts and therefore should not be charged to tenants. If they were, the cost is not unduly burdensome given the benefits to the city and to the tenant from controlling a more comfortable, livable apartment.

We almost never, ever agree with the landlord lobby, but in this case we did agree that these requirements make sense to add to this legislation. When have you ever seen NYCC and RSA agree on anything? Just because it is so rare, you should amend the law to follow our joint recommendations on rent regulation. In all seriousness, though, we do believe this bill ought to be tweaked in that manner.

We also want to make clear that the fix ultimately lies at the state level. We are pushing for an agenda we call Universal Rent Control, which includes closure of all the infamous rent regulation loopholes, including MCIs. With the State Senate moving to control by Democrats with an 8 seat gain, we expect this issue to be revisited next year. If state law is changed in 2019 to protect tenants and make the system fair, the MCI problem is eliminated. At that point, we would support simple amendment to this law that would apply the same requirements on rent regulated buildings as not-rent-regulated buildings. Rent regulated buildings would be included in these requirements the same as non-rent-regulated buildings.

Also, we have been told that there may be no legislative manner in which the Council can automatically include rent regulated buildings if and only if the state's MCI law is changed to prevent such rent hikes. NYCC is not legislative experts like that: if there were a way to do so, we urge the Council to consider adding it. We of course would want to be certain such language would protect tenants and would want to vet it with legal advice from our attorneys who help us on this issue.

We also urge the Council to remove stray language for some form of alternative compliance for regulated buildings at lines 3-4 of page 2, which reads:

"and alternative compliance for buildings with rent regulated housing accommodations"

This appears to be a simple drafting error perhaps left over from an earlier draft that considered some form of alternative compliance for rent-regulated buildings. It should be removed.

Auditing and Penalties

We also urge improvement to this bills enforcement provisions. In particular, we are concerned that the legislation incentivizes landlords to submit fraudulent reports. In our experience, some landlords are all-too-willing to submit phony paperwork to the city and state. They know they're committing fraud, but they do it anyway.

Therefore, we urge that this legislation be amended to direct the Office of Building Energy Performance to conduct audits of building energy use reports in sufficient number to ensure that building owners can expect to face an audit at some point of their report, and therefore will be disincentivized to submit fraudulent reports to avoid complying with this new law. We recommend the following language to be inserted in the section § 28-320.7 and that the section be re-titled "Penalties and Audits":

"The administering agency shall conduct a sufficient number of audits of reports submitted to the agency under § 28-320.3.5 to effectively deter submission of fraudulent reporting."

We also urge the legislation to be amended to include minimum penalties for non-compliance, not just maximum penalties. These penalties should rise for each year of non-compliance and should be large enough to ensure compliance.

Funding for Energy Efficiency, Particularly for Affordable Housing, While Ensuring Good, Quality Jobs

Finally, we urge the Council to consider that after this legislation is enacted, the City should properly fund these programs and the Office created, including in added financing to help build owners, particularly in affordable housing, to comply.

We estimate, along with our coalition allies at the Climate Works for All coalition, that the city should allocate about another $100 - $200 million per year to such programs. We understand that is a large yearly sum, but this crisis is an existential threat to the City. Ensuring these requirements success should be a top budgetary priority.

Not Using the Term "Emissions," Because it Underplays the Problem

NYCC organizes in communities to fight climate change. We tend not to avoid the term "emissions" because it sounds benign and underplays the problem. Greenhouse gases emitted by buildings' energy should be referred to as "pollution," which we believe more accurately describes the problem. We want building owners to change their mindset. We hope that they begin to understand that their buildings are large sources of pollution which threatens our collective health, welfare and survival. Therefore, we urge definitional changes to substitute "pollution" or "climate pollution" for "emissions" in the bill, in the hope that regulators then use straightforward, plain English as they implement the program. We believe that will help move this issue forward and further owner's understanding of the purpose of this program.

Pollution/Energy Efficiency Improvement Trading

While there remains much to explore and discuss, we note the potential for energy efficiency trading to generate revenue that could pay for work in buildings with less access to capital. We could see a system that would help pay for more improvements in communities of color than would otherwise be possible. It seems to use that many of the most run-down and therefore likeliest-to-be-inefficient buildings are in lower income communities, which are segregated by race in New York City, and that therefore if a trading system led to more improvements in those buildings at no cost that would improve the building for tenants and local air quality, that a trading system could be effective. We applaud that the Council has added a study contingent on fair treatment to communities of color to the legislation. This is an area that could fruitful, although the devil, so to speak, is very much in the details in trading systems.

Intro 1253 Is Excellent Even Without The Proposed Amendments Listed Above

In the end, these technical suggestions for amendments to the Intro 1253 should not be taken as criticism of the bill as a whole. These are merely suggested improvements.

Finally, we want to note that this legislation covers large buildings, which while only about 2% of the city's real estate (5% of its buildings), produces over 30% of the city's climate pollution.

Small buildings, of every shape and variety, produce the rest of the city's climate pollution from buildings. Once this legislation is enacted, we urge the Council to begin considering of legislation to cut pollution from small buildings by similarly large amounts to ensure that the city can reach 80x50. Legislation covering smaller buildings will need to be even more carefully considered that this legislation, especially since small buildings, such as 1 or 2 family homes, are often owned or operated by unsophisticated owners who are not wealthy.

The legislation as drafted is a worldwide model. It is camera ready, right now. Passing and then implementing this legislation will be an extraordinary accomplishment. It is truly New York City's Green New Deal. It can lead the world to the action needed to stop the climate crisis and create good, sustainable, union jobs

Again, we thank the Chair, Speaker and Councilmembers, and urge you to quickly enact this legislation.

Thank you.

Lisa DiCaprio, Statement in support of Int. 1253-2018 for December 4, 2018 City Council Committee on Environmental Protection hearing. [4 pages]

My name is Lisa DiCaprio. I am a professor of Social Sciences at NYU where I teach courses on sustainability. I am also the Conservation Chair of the Sierra Club NYC Group.

As buildings are responsible for about 70% of all greenhouse gas emissions in NYC, initiatives to reduce these emissions are crucial, especially given the conclusions of the UN Intergovernmental Panel on Climate Change (IPCC) and the Fourth National Climate Assessment reports that were issued in October and November of this year.

The Sierra Club supports Int. 1253-2018 which would establish an Office of Building Energy Performance and mandate energy efficiencies for buildings over 25,000 square feet.

This bill implicitly acknowledges that Local Law 87, which covers buildings over 50,000 square feet and only requires retro-commissioning rather than retrofitting every ten years, has failed to achieve the anticipated reductions of greenhouse gas emissions. Moreover, most of the reductions have resulted from conversions of electricity sources to natural gas.

By contrast, the goal of Int. 1253-2018 is to reduce greenhouse gas emissions from covered buildings by 40% by 2030 and 80% by 2050. This bill is necessary if NYC is to achieve an 80% by 2050 reduction in greenhouse gas emissions, as mandated by law. This bill is also feasible and its successful implementation can be ensured by the collective efforts of engineers, architects, the construction trades, and building owners as well as supervisory and maintenance personnel.

Before commenting on specific aspects of Int. 1253-2018, I would like to relate NYU's success in reducing its greenhouse gas emissions. As described on the NYU sustainability website: "When NYU accepted the Mayor's Carbon Challenge in 2007 to reduce its emissions 30% by 2017 (based on 2006 levels), the university's emissions were about 0.30% of New York City's total. We reached our reduction goal in 2012, five years ahead of schedule. In 2015 we accepted the new Mayor's Carbon Challenge: a 50% reduction in emissions by 2025." The university's five main strategies for increasing building efficiencies are: "green construction and renovation, conservation through behavioral changes from building occupants, retrofit and upgrades to buildings, operational innovations to run buildings more effectively, and using cleaner, more efficient energy." NYU initiatives include the installation of motion and heat sensors, light timers, a co-generation plant, LED lighting, and demand response management, which is an arrangement with Con Edison to reduce energy use during peak periods. (For more details, see: https://www.nyu.edu/life/sustainability/areas-of-focus/energy.html)

In support of Int. 1253-2018, the Sierra Club is providing recommendations with reference to the following sections of the bill, which I have indicated in bold. (I am submitting a more extensive written statement.)

Page 7, § 28-320.1 Definitions. As used in this article, the following terms shall have the following meanings:

> **COVERED BUILDING. The term "covered building" means (i) a building that exceeds 25,000 gross square feet or (ii) a city-owned building. Covered building shall not include rent regulated accommodations.**

To prevent the imposition of an MCI, this bill only requires retro-commissioning for buildings with rent regulated apartments. To allow for these buildings to be retrofitted in the future, advocates for the renewal of the rent-stabilization law in next year's NYS legislative session should propose the elimination of the MCI for specified energy efficiency initiatives because residential building owners benefit financially from the reduction of their operating expenses. (For a fact sheet on the MCI, see: http://www.nyshcr.org/Rent/FactSheets/orafac24.htm)

Page 10, § 28-320.3.1 Building emissions limits 2022-2023. For calendar years 2022 and 2023 the annual building emissions limits shall be calculated as follows:

All owners of buildings covered by this legislation should be required to install motion sensors, exempting the means of egress, during this first phase. Lighting up empty offices wastes energy and at night contributes to light pollution, which is a growing global crisis. (See: http://www.darksky.org/light-pollution) In residential buildings, motion sensors can be installed in common areas, such as laundry rooms and storage spaces.

Page 10, § 28-320.6 Outreach and education. The administering agency shall establish and engage in outreach and education efforts to inform building owners about building emissions limits, building emissions intensity limits and compliance with this chapter. The materials developed for such outreach and education shall be made available on the department's website.

The outreach and education materials prepared by the proposed Office of Building Energy Performance should include a handbook that provides information on financing options, such as the sustainable energy loans proposed in Int. 1252-2018; the rate of return on investments, the websites for the NYC Solar Map (https://nysolarmap.com) and the online geothermal screening tool that identifies NYC buildings with geothermal potential (https://www1.nyc.gov/assets/ddc/geothermal/Geothermal%20Screening%20Webtool%20Pre-Feasibility.pdf), ESCOS that supply electricity from all renewable sources, and Passive House retrofits.

Passive House is an international building efficiency standard that saves up to 90% of the energy required for heating and cooling conventional buildings and 75% of all energy usage when electricity is included in the total. For a study on how a Passive House retrofit could be carried out in an occupied 15-story, 123,000 gross square foot residential building in Brooklyn, see the Building Exchange report, "Pursuing Passive: Strategies for a High Comfort, Low Energy Retrofit in NYC": https://be-exchange.org/report/pursuing-passive. This building was constructed in 1950 with masonry exterior walls and has 163 apartments. I am attaching a copy of the report with my statement. For a more detailed version of the report, see: https://be-exchange.org/wp-content/uploads/2018/10/BEX_PursuingPassive_181101.pdf See also the website for New York Passive House: https://www.nypassivehouse.org and my article, "High-rise Passive House in NYC": https://atlantic2.sierraclub.org/content/high-rise-passive-house-nyc.

The handbook for building owners should also include information they can provide to building occupants on how to reduce their personal consumption of energy, such as switching to LED light bulbs with a color temperature rating of 3,000 Kelvin or less, as recommended by the AMA (see: http://nyida.org/wp-content/uploads/2016/06/AMAPressReleaseBlueLight.pdf)

and plugging appliances (excluding refrigerators) into smart power strips. The standby power, also referred to as phantom load, that is drawn by appliances when they are plugged into an outlet, but are not in use, is estimated to represent about ten percent of a building's overall electricity consumption and, according to the U.S. Department of Energy, 75% of the total electricity usage of an appliance. (See: https://20somethingfinance.com/electrical-leaking-standby-appliance-list) For example, air conditioners should be unplugged required in the summer.

For new legislation in the near future, I recommend:

1. Requiring building owners to obtain electricity from renewable sources that are either generated on site or obtained by green power purchasing.

- Specifically, if technically feasible, require building owners to install a green roof, solar panels, and/or urban wind turbines, as appropriate for the structural condition of the roof, the location of the building, and its potential for solar and/or wind power.

- In buildings where (a) the owner pays for the electricity, either in the common areas or in all of the units because the building is not submetered, and (b) on-site renewable energy is not feasible or would only cover a small portion of all electricity usage, require the building owner to switch from Con Edison to an ESCO that supplies electricity from all renewable energy sources.

2. Mandating the successful completion of the Green Super training program for all building supers.

3. A new City Council bill to mandate energy efficiencies for the 800,000 buildings in NYC that are one to four units. These buildings, which are responsible for about half of all greenhouse gas emissions from buildings in NYC, are currently exempted from any efficiency requirements.

Energy audits and financial incentives for audits and retrofits are available from the U.S. Department of Energy's Home Performance with Energy Star program (https://www.energystar.gov/campaign/improvements) and NYSERDA (https://www.nyserda.ny.gov/Residents-and-Homeowners) As related in Jen A. Miller's November 4, 2018 New York Times article, "Winter is Coming: Is your home ready for the first deep freeze," NYSERDA has provided energy audits for about 126,000 NYS residents of whom 60% have implemented one or more energy efficiency initiative. (See: https://www.nytimes.com/2018/11/02/realestate/winter-is-coming.html) These voluntary initiatives are not sufficient. All owners of one to four unit buildings in NYC must be required to obtain an extensive home-energy audit and, within two years, to implement the highest level of retrofits that are recommended based on the results of the audit.

4. We should look forward to eventually requiring all buildings in NYC and not just all NYC-owned buildings to transition to fossil-free electricity, heating and cooling, and hot water systems. (For the bill requiring all NYC-owned buildings to be "powered by green energy" by 2050, see: Int. 0598-2018 amended version, which was introduced by Speaker Corey Johnson, passed by the City Council this year, and signed into law by Mayor de Blasio:https://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3344782&GUID=58E3ED36-D6C6-4B12-9816-16996ACA259B&Options=ID|Text|&Search=Int.+0598-2018)

5. Require electric or electromagnetic stoves in all new buildings. Each installation of a gas stove expands the natural gas infrastructure and increases our reliance on fossil fuels.

By 2050, NYC's electricity grid will be considerably greener than it is today because the Clean Energy Standard ruling issued in 2016 by the Public Service Commission (PSC) requires all NYS utilities to distribute half of their electricity from renewable sources by 2030. This 50% mandate should be progressively increased after 2030 along with the installation of solar and wind power (on and offshore) in NYS.

Finally, on an individual and collective basis, we all have a responsibility to reduce greenhouse gas emissions, as our city's future depends on the transition to a new, green economy.

Report

Pursuing Passive: Strategies for a High Comfort, Low Energy Retrofit in NYC

deep retrofits retrofit multi-family

DOWNLOAD RESOURCES

Overview

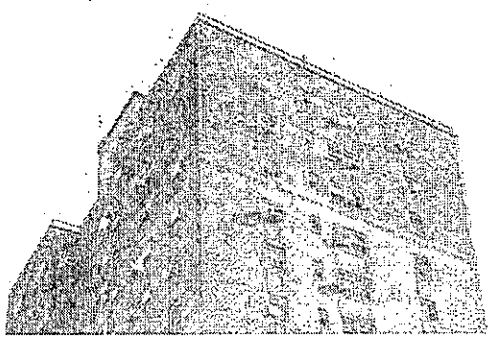
The retrofitting of existing buildings is a central component of the climate action plans of virtually every city in North America. Many of today's buildings were constructed in an era of inexpensive fossil fuels, the impacts of which were largely unknown. The opportunities to lower emissions by improving energy efficiency in buildings is significant and the simplest available measures are well understood and are regularly implemented in buildings of various types. However, while many buildings perform efficiency upgrades to individual systems, there are limited examples of occupied buildings that perform the type of integrated retrofits that are likely needed for most cities to meet their climate action goals. Upgrading existing buildings will require significant resources. In addition to raw efficiency, retrofits must deliver a high-quality environment, be primed for a future powered by renewable energy, and provide resiliency in the face of future climate fluctuations and crises.

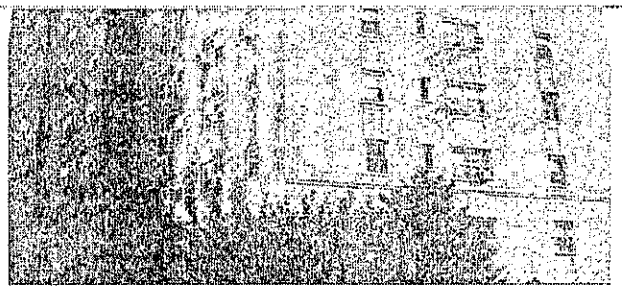
The emphasis of the study is on selecting energy conservation measures and phasing these measures over time, while the building is occupied. This report also describes how capital planning for such measures might be organized, code and regulatory barriers to pursuing this deep retrofit, and the most important technical and market challenges. The goal of this work is to provide a high-level guidance document that allows similar such buildings to envision a phased deep retrofit of their own building.

Context: Building + Policy

For this study, we have selected an existing building in New York City, one typical for a large segme city, and analyzed what measures would be necessary to deliver the most comfortable building for occupants while using the least amount of energy. To analyze how to reach this dual goal of humar and energy efficiency we have utilized the Passive House standard for existing building retrofits: En

The Building





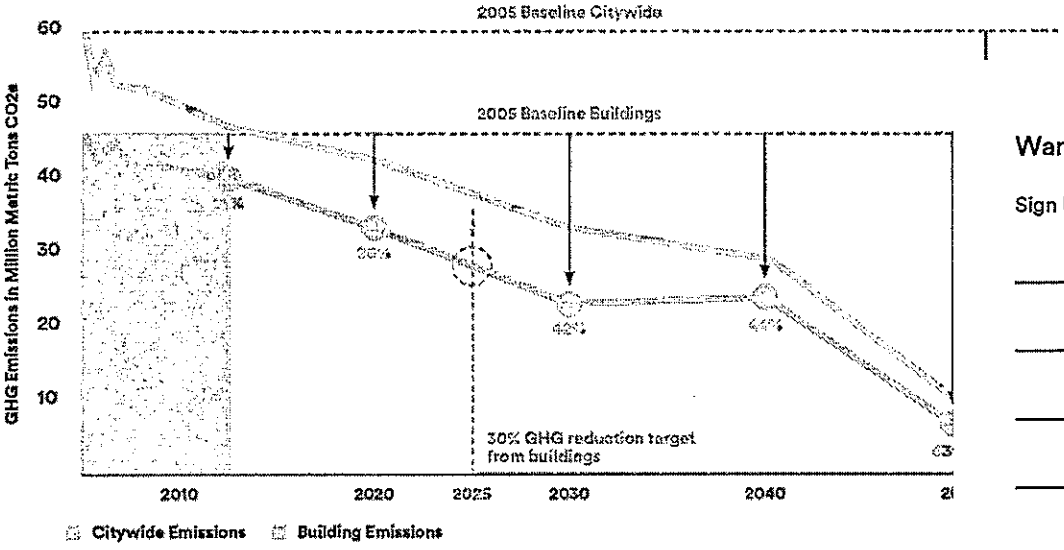
The building selected for study is a 15-story, market-rate residential building in Brooklyn. Constructed in 1950, the building has masonry exterior walls that enclose 163 apartments across 123,000 gross square feet. The tower is typical of a large swath of buildings in New York City (as well as many other regions) and has many of the most common challenges that will be encountered by anyone looking to perform a deep retrofit of an occupied multifamily building.

Policy

As early as 2007, the City of New York identified buildings as a critical sector in their climate action plan, PlaNYC. This plan resulted in the development of the Greener, Greater Buildings Plan which required large buildings to benchmark their annual energy and water use, and to undergo a whole building energy audit once every ten years.

In 2015, the City reaffirmed its focus on buildings with the release of OneNYC. The current climate action commitments outlined in OneNYC revolve around an aggressive goal of reducing citywide carbon emissions 80% by 2050 ("80 × 50"), using 2005 as a baseline.

NYC's Pathway to 80 × 50



To meet the 80 × 50 goal, the CO2 emissions of all NYC buildings must be reduced by more than 60%. The challenge moving connecting this citywide goal to actions within individual buildings[2]

The building selected for this study fits within the "Multifamily, Post-war (to 1980), greater than 7 st

Want the latest

Sign Up Below For L

describes ways to phase these in overtime while the building is occupied.

Passive House Performance Criteria vs. Existing Conditions

	PH Criteria	Proposed	Existing	Delta
Heating energy demand*	6.34	6.33	35.11	82%
Cooling energy demand*	5.71	4.66	5.8	20%
Primary Energy Demand*	39.93**	36.58	99.44	63%
Primary Renewable Energy Demand*	60/45/30	30.17	123.14	75%
*kBTU/sf/yr				
**varies with project parameters				
Airtightness (ACH 50)	1.0	1.0	5.0	5X
Window U-value (average)	0.18	0.144	0.8	5X
Walls (R-value)	-	10.0	2.4	4X

Comparison of i) the criteria to meet the EnerPHit standard, ii) the estimated performance of the proposed retrofit, and iii) the existing conditions, where known.

The primary retrofit components needed to achieve the EnerPHit standard for our subject building are relatively simple:

- Replace the windows with high performance units
- Reclad the façade with insulation and an airtight layer
- Upgrade the ventilation to a balanced system with heat recovery
- Replace the heating and cooling with a high efficiency system

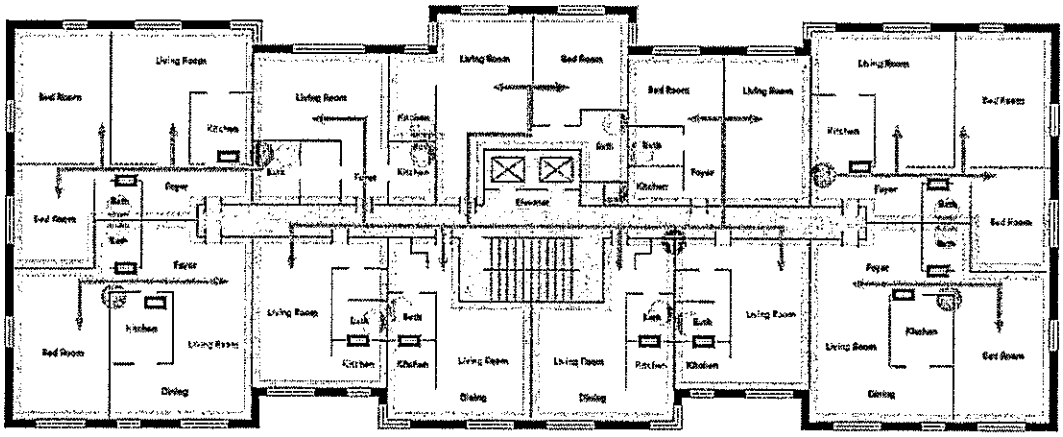
Strategies

The analysis described throughout this report was performed jointly by Steven Winter Associates in New York, New York and the Passive House Institute (PHI) in Darmstadt, Germany. PHI is the original developer of the Passive House standard, which they continue to refine, and among many other activities admin international network of accredited Passive House certifiers.

Multiple strategies have been explored in each category to determine the most effective solution tl disruption to the occupants. To meet the Passive House EnerPHit criteria, analysis was done on the systems and possible improvements:

1. Envelope:
   - Roof Insulation
   - Airtightness measures (shafts, etc.)
   - EIFS and sheathing at exterior (incl. airtightness layer, and VRF risers at exterior)
   - or Rainscreen System
2. New Passive House certified windows
3. Heating + Cooling
   - Install VRF units (Distributed or Centralized)
     - Replace steam radiators with VR cassettes
     - connect to risers
     - Recladding
   - or High Performance Packaged Units
4. Ventilation
   - Decentralized, semi-decentralized or centralized ERV supply
   - Return ventilation system

Proposed Central Ventilation



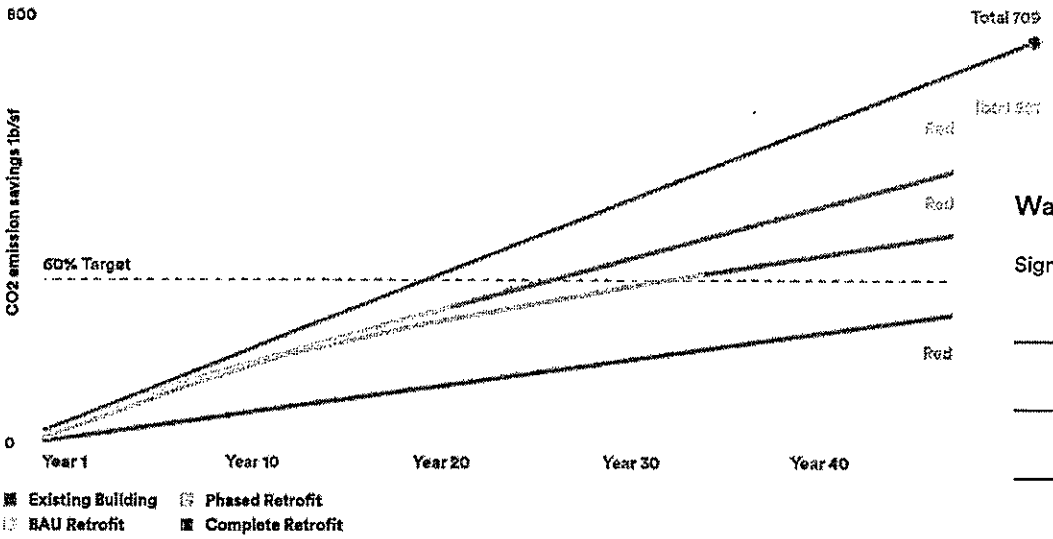
Supply Bath return Kitchen return Transfer grille

In the proposed scenario the existing ventilation shafts are repurposed, converting the system from exhaust-only to balanced. Rooftop ERV units serve the new supply risers, and transfer grilles allow the reufrbished exhaust lines to extract from each room.

Phasing

Although a full retrofit is the least disruptive overall, phasing has been carefully explored so that owners might align upgrades with financial or other milestones.

Long Term Impact of Retrofit Scenarios



Although a phased retrofit is a far better option than business-as-usual replacements of equipment, performing the full retro single phase produces significantly improved outcomes, including earlier enjoyment of the full benefits of the retrofit.

Proposed Retrofit Strategies

1 New windows + roof insulation + airtightness measures (shafts, etc.)

Proposed Retrofit Phases

Year 0 Envelope 1: windows + roof insulatic

Want the latest

Sign Up Below For U

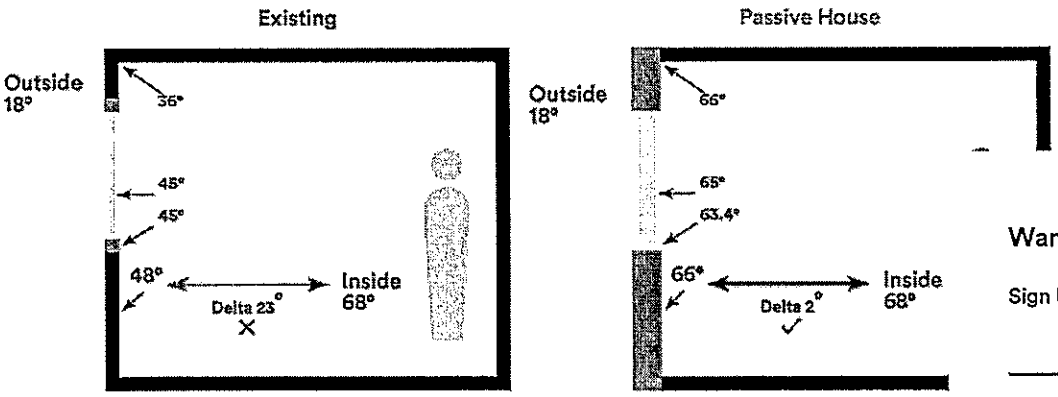
	ALT 4: High-performance packaged units		
5	Replace domestic hot water heat exchanger with high efficiency boiler	Year 16	Replace domestic hot water boiler with high efficiency model
6	LED lighting and controls, energy efficient elevators, EnergyStar appliances	Anytime	Upgrade lighting to LED, upgrade elevators, install energy efficient appliances

> The good news about climate change is that it is cheaper to fix than it is to ignore.
>
> AMORY LOVINS, THE ROCKY MOUNTAIN INSTITUTE

Benefits + Costs

A complete Passive House retrofit results in a radical transformation of the building, from improved comfort, air quality, and aesthetics, to more responsive heating and cooling systems and far lower utility bills.

Thermal Comfort and Interior Temperatures



Insulating the exterior and installing high-performance windows ensures that the inside surface temperature of the exterior wall warmer throughout winter and, most importantly, closer to the interior air temperature. Research indicates that comfort is signif compromised when this difference is greater than 7 degrees F. We estimate the existing building suffers from a difference nearly

The report includes conservative estimates of costs of each phase of the proposed work.

Simple energy efficiency projects are typically evaluated by the number of years required to pay ba expenditure from utility savings. But this is an insufficient lens through which to evaluate a deep ret transforms a building in almost every capacity. Instead, we should evaluate these projects based or impact on the total value of the building.
At the same time, we should identify mechanisms to connect the overall societal benefits of these p

Path Forward

Moving forward we will need to incentivize a more effective delivery of retrofitted systems, whether this means creating a strong market demand for modular recladding systems or ensuring the installation of efficient equipment such as the high performance packaged heating and cooling units. We will also need to identify mechanisms that connect the broader societal benefits of deep retrofits with the costs to individual building owners.

A substantial percentage of our existing building stock must undergo deep, holistic retrofits if we are going to meet our climate action goals and avoid the most calamitous impacts of global climate change. We've selected the Passive House pathway to inform this report because of its focus on comfortable, healthy spaces and its strong track record of delivering significant heating and cooling energy savings. The costs are substantial, but the benefits are extensive and result in a radically transformed building of significantly higher value that will allow our community to meet its climate action goals. Inaction is not an option.

We recommend the following path forward to build on the work of this report:

- Deep Retrofit Studies: Applying this analytical framework to multiple other building typologies.
- Modular Systems Research: Additional research to determine the feasibility of creating modular retrofit systems.
- Finance and Policy Research: Financial and policy instruments that might directly incentivize extensive and holistic retrofits.
- High-Performance Systems Research: Identify systems or products either available elsewhere, or are on the cusp of commercialization, that could significantly improve the transformation of existing buildings.
- Education and Training: Extensive education and technical training to enable high-performance retrofits to move forward at scale.

It is clear from our analysis that it is feasible to transform an occupied building of this type to meet the demands of our coming century, and while doing so producing a living environment of far higher quality than we currently experience.

Contributors

Primary Author
Yetsuh Frank
Building Energy Exchange

Lead Technical Advisor
Lois Arena
Steven Winter Associates

Passive House Modeling
Jan Steiger
Passive House Institute

Cost Estimating
Greg Bauso
Monadnock Construction

Technology Support
Sam McAfee
Fentrend

Mike Woolsey
Swegon

EDF
ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

Comments of Environmental Defense Fund
Before the Environmental Committee of the New York City Council
Regarding Int. 1253-2018 and Int.1252-2018

December 4, 2018

Good morning, Council Member Constantinides and members of the Environmental Committee. My name is Isabelle Silverman (isilverman@edf.org) and I am a Senior Fellow at Environmental Defense Fund (EDF). EDF is a not-for-profit, non-partisan, international environmental organization with headquarters in New York City. With over two million members, more than 35,000 of whom are New York City residents, we work to advance market-based policy to address the world's greatest environmental challenges.

EDF applauds the sponsors of Int. 1253-2018 and Int. 1252-2018 for taking much needed action to dramatically reduce greenhouse gas emissions from New York City buildings and make on-lease financing available.

The time to act decisively to slow down catastrophic climate change is now. With devastating wildfires, hurricanes, floodings, record temperatures and droughts becoming the new normal, we have to make carbon reductions a priority for our buildings.

One major scientific report after another is issuing the same dire warning: "if significant steps are not taken to rein in global warming, the damage will knock as much as 10 percent off the size of the American economy by century's end." That's "more than double the losses of the Great Recession a decade ago", the most recent federal report states. (New York Times, *U.S. Climate Report Warns of Damaged Environment and Shrinking Economy*, November 23, 2018.

Crucial to include rent-regulated buildings in the bill

Buildings with one or more rent-regulated accommodation should be included in Int. 1253 as per the Urban Green Partnership recommendations for rent-regulated buildings (p. 38 of the detailed Urban Green Partnership report).

For the following reasons, we urge you to include rent-regulated buildings:

- 40% of the multifamily square footage of covered buildings have one or more rent-regulated accommodation. Excluding them entirely will leave a significant amount of greenhouse gas (GHG) emission reductions on the table and will, most likely, prevent us from meeting 80x50.
- Most importantly, the Urban Green Partnership recommendations were vetted with organizations representing rent-regulated tenants (e.g., New York Communities for

Change). They recognized that even **if** some of the prescriptive energy conservation measures (ECM) lead to an MCI rent increase, it would not be a substantial rent increase since the listed prescriptive ECM are not calling for the replacement of boilers, roofs, windows or other major building systems.

I would also like to refer you to the testimony of Pete Sikora confirming that New York Communities for Change also believe the Partnership's recommendations for rent-regulated buildings should be added to this bill to give important energy savings to rent-regulated tenants and increase resident comfort.

- The below-listed prescriptive ECMs would, most likely, improve resident comfort for many rent-regulated residents (less overheating, fewer noisy heat pipes, controllable radiators and avoiding hot water temperatures above 120 deg F). We don't want rent-regulated tenants to be left out from these benefits. Resident comfort must be valued as well.

- If we leave rent-regulated buildings out of this bill, it will take too long to get them covered under the bill if State Major Capital Improvement (MCI) Laws change in the future. We recommend adding rent-regulated to the bill and also give the Advisory Board power to expand requirements for rent-regulated buildings if MCI laws do indeed change.

- LL87 has led to energy usage reductions of under 5% so simply requiring compliance with LL87 is not sufficient for 40% of the multifamily square footage.

Below is the list of prescriptive measures from the Urban Green Partnership report.
It's important that all of them are included in Int. 1253 even if some of them are already in LL87.

1. Installing temperature controls on radiators (thermostatic radiator valves [TRVs])
2. Installing indoor heating system sensors and boiler controls (Energy Management System)
3. Changing temperature set points for heat or hot water (added EDF recommendation: add allowable maximum temperature to Section 28-308.3.1.1.13 of LL87)
4. Upgrading common area lighting
5. Replacing or repairing steam traps
6. Install radiant barrier behind radiator
7. Repairing heating system leaks
8. Tuning up heating system
9. Insulating pipes for heating and/or hot water
10. Insulating steam system condensate tank or hot water tank
11. Installing or upgrading master venting (steam system)
12. Air sealing and weatherization, such as caulking and replacement of gaskets
13. Installing timers on exhaust fans
14. Installing insulating radiator enclosures with temperature controls (like the Cozy)

The 2022/2023 compliance date should be a 20% reduction requirement instead of building emissions intensity limits

EDF supports that Section 28-320.3.1 will determine which buildings will have to comply with the bill's first emission reduction deadline (the ones above the listed building emissions intensity limits).

However, we believe that a sector-wide percentage reduction (20%) by 2022/2023 is more feasible in such a short time frame than a building emissions intensity limit as is in the bill now. The Urban Green Partnership had broad consensus on a percentage reduction being more feasible because it will take building usage characteristics into account as we meet buildings where they are today.

One of the bills most beneficial effects is getting building owners to pay attention to wasted energy and start implementing energy audit-recommended (or other) ECMs. A required percentage reduction will do just that and hopefully many buildings will exceed the required percentage reduction.

EDF is concerned that if some buildings will have to reduce too much energy usage for the first deadline, the City will simply be inundated with Variances applications and renewal Variance applications.

Since the passing of the Greener, Greater Buildings Plan about ten years ago, buildings above 50,000 SF have put resources into benchmarking their energy usage, completed ASHRE II energy audits and performed retro-commissioning under LL87. However, a majority of buildings have not voluntarily implemented ECM – not even the ones with short pay-back periods.

We don't want these energy audits collect anymore dust so it's important to keep the momentum and start implementing ECMs as soon as possible. Buildings with the highest energy consumption per SF and possibly also the largest buildings would start first.

Buildings have been on notice for many years that these recommended ECM might be mandated one day if building owners don't implement them voluntarily.

Backstop carbon caps/building emissions intensity limits are important

We support the concept of backstop carbon caps because it will put building owners on notice as to where the City is heading in terms of future building emissions. This will allow building owners to plan within capital cycles. In addition, such backstop carbon caps will force the Advisory Board to come to a reasonable solution.

Also, the deadline for the creation of the metric and required reductions should be moved up to 2020.

New York State Green Energy Source

Only renewable energy from New York State should count as a green energy source.

Add Minimum Penalties

We recommend adding required minimum penalties to the bill to give it more teeth.

Strengthen and Clarify Language for Variances

EDF believes the Variance is too broad and too easy to obtain. This could lead to buildings choosing the Variance over full compliance.

A variance should only be available for any shortfall after the owner has complied with this bill to the "maximum extent practicable" and the bill language should clarify that.

Any subsequent application to variances should be subject to additional scrutiny to ensure the owner made a good faith effort to comply.

Will the City change Landmark window laws to allow double-pane windows also for "Individual Landmark buildings" and windows of these Individual Landmark buildings to be replaced as of right and not only when they are beyond reasonable repairs?

Miscellaneous Recommendations

The bill should require that rules for each phase be developed in a timely manner.

The City requires a minimum hot water temperature of 120 deg F. LL87 could be adjusted to add a maximum allowable hot water temperature for all buildings for conservation and safety purposes.

Possible typos/drafting mistakes

Section 28.320.1, Definitions. Include oil in the definition of fossil fuel ("...means a fuel such oil, coal or gas.....)

Section 28-320.2.2.
2. the date at the bottom is currently December 31, 2021 for the report to be delivered to the Mayor but the working groups only have to start the report in 2024 so the date must be after 2024.

Section 28-320.7.2
3. sentence afterwards should read "granted" instead of "grated"

Section 28-320.7.3
It refers to subparagraph (a) and (b) but it should say (i) and (ii)

THE LEGAL AID SOCIETY

199 Water Street
New York, NY 10038
T (212) 577-3300
www.legal-aid.org
Direct Fax: (646) 616-4339

Blaine (Fin) V. Fogg
President

Seymour W. James, Jr.
Attorney-in-Chief

Adriene L. Holder
Attorney-in-Charge
Civil Practice

TESTIMONY BEFORE THE NEW YORK CITY COUNCIL COMMITTEE ON ENVIRONMENTAL PROTECTION

December 4, 2018

Thank you Chairperson Constantinides, Speaker Johnson, and members of the Committee on Environmental Protection, for the opportunity to provide testimony today.

This testimony is submitted on behalf of The Legal Aid Society. The Society is the oldest and largest program in the nation providing direct legal services to low-income families and individuals. The mission of the Society's Civil Practice is to improve the lives of low-income New Yorkers by providing legal representation to vulnerable families and individuals to assist them in obtaining and maintaining the basic necessities of life — housing, health care, food and subsistence-level income or self-sufficiency. The Society's legal assistance focuses on enhancing individual, family and community stability by resolving a full range of legal problems in the areas of housing and public benefits, foreclosure prevention, immigration, domestic violence and family law, employment, elder law, tax law, community economic development, health law and consumer law.

The legislation before the Committee today is truly historic. In a time of ever threatening climate change, the Council is poised to become a world leader in reducing climate pollution forty percent by 2030 and over eighty percent by 2050. When we first heard about this ground breaking legislation, we were concerned that our clients, low-income tenants, would not be able to see the results of a greener, less polluted New York City. As you well know, rent regulated housing has state mandated mechanism to pass along any improvements required by law to tenants. These rent increases happen even

where the improvements lead to landlords paying less in energy costs. The landlords' costs may go down but the tenants' rents go up permanently. Tenants across the City are being displaced from their homes because of these Major Capital Improvement increases.

Thank you for taking rent regulated tenants out of the legislation and taking their concerns seriously. Low-income tenants, like all New Yorkers, deserve an opportunity to live a cleaner, less polluted New York City. We appreciate working with a Council that considers the effects of legislation on our clients' lives and believes in a City that includes low-income New Yorkers.

We would be happy to work with you and this committee to change the Major Capital Improvement law in Albany to ensure that energy improvements cannot be passed along to tenants. When we are success in this effort, we would be happy to discuss amendments to this legislation.

We look forward to working on these issues with you and your committee.

Respectfully submitted,

Ellen Davidson, Esq.
The Legal Aid Society
Civil Practice
Law Reform Unit
199 Water Street, 3rd Floor
New York, NY 10038
(212) 577-3300

NEW YORK **ENERGY** CONSUMERS COUNCIL

Testimony of the New York Energy Consumers Council ("NYECC") Before the New York City Council Committee on Environmental Protection Regarding A Local Law to amend the New York city charter and the administrative code of the city of New York, in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2050

December 4, 2018

NYC Council Bill – Int. No. 1253-2018

Good afternoon Chairman Constantinides, Speaker Johnson, and Council and Committee Members. My name is Phil Skalaski and I am the Co-President of the New York Energy Consumers Council. I am also Vice President of Engineering and Energy Services for The Durst Organization, a member of NYECC.

NYECC is a not-for-profit organization, who with its predecessor organizations, The Owners' Committee on Electric Rates (OCER) and The New York Energy Buyers Forum (NYEBF) have represented the interests of New York City and Westchester County energy ratepayers in general and of commercial property owners in particular before the New York State Public Service Commission for nearly 70 years. Our members also include city hospitals, colleges, a governmental agency, a financial institution, and other real estate organizations. NYECC routinely intervenes in Con Edison electric, gas and steam rate cases before the Commission to ensure just and reasonable rates not only for its members but for many other ratepayers in Con Edison's service territory as well.

NYECC has identified a number of concerns about Int. No. 1253, a bill that, among other things, establishes greenhouse gas emissions limits for existing buildings.

First, an unintended consequence of Int. No. 1253 is that it will increase the electric rates for all of New York City's electric consumers ratepayers, irrespective of building ownership. Int. No. enforces GHG limits without providing conversion factors for how to convert energy usage to GHG. Depending on the factors that may be determined by the administering agency, a fuel shift may be required. This proposed legislation if enacted will have building owners scrambling on a wholesale basis to convert some or all of their building systems to electricity in

their attempt to comply and avoid penalties assessed on exceeding GHG limits. This en masse conversion to the electrification of the City's buildings will require not only additional generation resources to meet this additional demand but also significant additional transmission and distribution infrastructure in Con Edison's service territory in New York City, which will have to be borne by electric ratepayers.

An analysis performed by London Economics International for NYECC entitled "Estimating the Impact of Carbon Legislation for NYC Buildings on Electricity Costs" that draws this very conclusion accompanies this testimony. The London Economics report specifically analyzed the fossil fuel limitations outlined in the Committee's predecessor bill, Int. No. 1745, whereas Int. No. 1253 focuses on whole building GHG caps. The results will undoubtedly be the same and are likely to be accelerated due to proposed compliance requirements projected for as early as 2022. The premature move to electrify so many building heating systems at the same time with the drastic attendant price increase consequence to all electric ratepayers runs contrary to the just and reasonable rates standard the NYS Public Service Commission applies to utilities.

This Committee and this City Council should follow the Commission's lead in engaging in action that is gradual so that New York City's ratepayers who have to pay some of the highest electric rates in the country are not burdened even more going into an electric rate case with Con Edison next month. It is worth noting that by the end of 2019, Con Edison's electric ratepayers will have paid nearly $1.2 billion more for the Con Edison revenue requirement over the current three-year rate plan. In less than one month, New York City's electric ratepayers are also scheduled to pay an additional $199 million in their Con Edison electric rates for the Company's revenue requirement starting on January 1, 2019.

Ironically, premature electrification of New York City's buildings will have the further unintended consequence of forcing the NYS Public Service Commission away from its current policy objectives of utilizing distributed energy resources and demand response in line with the Reforming the Energy Vision (REV) proceeding and related proceedings in order to support the grid where needed. Due to the drastic amount of additional electricity demand which will inevitably occur and which is above and beyond the electric demand already forecast, utilities will unfortunately need to revert back to more traditional and even more costly investments in distribution infrastructure.

Second, the emission standards and targets proposed in the legislation are not rationally based, and are premature. There must be a process in place to ensure a path forward - both structurally and financially - so building owners can reasonably attain these targets. Accompanying this process should be a modification to the targets themselves, as well as a reasonable extension of the compliance timeline.

Third, the legislation does not outline resources to owners of buildings exempt from compliance who still wish to reduce their carbon footprint. Examples of such exempt buildings include affordable housing. The proceeds from any penalties collected from this bill should be used towards improving the energy performance of such buildings, many of which are consuming energy well above the proposed emissions targets.

NYECC looks forward to working with the Council to improve Int. No. 1253 so that the cost detriments to all of New York City's electric ratepayers do not overwhelm the benefits intended by the Committee by Int. No. 1253. I would be happy to answer any questions that you may have.

Estimating the Impact of Carbon Legislation for NYC Buildings on Electricity Costs

Prepared for the New York Energy Consumers Council by London Economics International LLC

October 26, 2018

London Economics International ("LEI") was engaged by the New York Energy Consumers Council ("NYECC") to perform an analysis of potential impacts on electricity costs from proposed carbon legislation (Bill No. 1745) in New York City ("NYC"), which would impose limits on the use of fossil fuel and total energy usage for buildings in NYC. This document estimates the impact on NYC capacity and transmission & distribution system costs due to increased peak electric demand following the electrification of buildings in order to comply with the proposed limits on fossil fuel usage. Using a Base Case set of assumptions, LEI estimated that the NYC peak load by 2035 could be approximately 3,148 MW higher than currently forecast. This additional peak load could lead to an increase of $1.5 billion in capacity costs for that year, in addition to $1.4 billion annually in additional costs associated with expanding ConEd's electric transmission and distribution network in NYC.

Table of contents

London Economics International LLC
717 Atlantic Avenue, Suite 1A
Boston, MA 02111
www.londoneconomics.com

contact:
Gabriel Roumy/Ian Chow
617-933-7225
gabriel@londoneconomics.com

contact:
Gabriel Roumy/Ian Chow
617-933-7225
gabriel@londoneconomics.com

Table of figures

contact:
Gabriel Roumy/Ian Chow
617-933-7225
gabriel@londoneconomics.com

List of acronyms

AFUE	Annual Fuel Utilization Efficiency
BPTF	Bulk Power Transmission Facilities
BTM	Behind-the-Meter
BTU	British Thermal Units
CARIS	Congestion Assessment and Resource Integration Study
CES	Clean Energy Standard
CONE	Cost of New Entry
ConEd	Consolidated Edison Company of New York
COP	Coefficient of Performance
CRP	Comprehensive Reliability Plan
CSPP	Comprehensive System Planning Process
DCR	Demand Curve Reset
DER	Distributed Energy Resource
DMNC	Dependable Maximum Net Capability
DOE	Department of Energy
DSIP	Distribution System Implementation Plan
DSM	Demand Side Management
ECM	Energy Conservation Measures
EF	Energy Factors
EFORd	Estimated Forced Outage Rate on demand
EIA	Energy Information Administration
EREE	Office of Energy Efficiency and Renewable Energy
EUI	Energy Use Intensity
FERC	Federal Energy Regulatory Commission
GHG	Greenhouse Gas
HVDC	High Voltage Direct Current
ICAP	Installed Capacity
ILRP	Integrated Long Range Plan
IRM	Installed Reserve Margin
LCR	Locational Capacity Requirements
LEI	London Economics International, LLC
LL84	Local Law 84
LL87	Local Law 87
LOLE	Loss of Load Expectation
LSE	Load Serving Entities
LTPP	Local Transmission System Planning Process

MMBtu	Million British Thermal Units
NERC	North American Electric Reliability Corporation
NPCC	Northeast Power Coordinating Council
NREL	National Renewable Energy Laboratory
NWS	Non-Wires Solutions
NY PSC	New York Public Service Commission
NYC	New York City
NYCA	New York Control Area
NYECC	New York Energy Consumers Council
NYISO	New York Independent System Operator
NYSERDA	New York State Energy Research and Development Authority
NYSRC	New York State Reliability Council
OpenEI	Open Energy Information
PPTPP	Public Policy Transmission Planning Process
RECS	Residential Energy Consumption Survey
REV	Reforming the Energy Vision
RNA	Reliability Needs Assessment
RPP	Reliability Planning Process
T&D	Transmission and Distribution
TMY	Typical Meteorological Year
TO	Transmission Owner
UCAP	Unforced Capacity
ZEC	Zero-Emission Credits

1 Executive Summary

London Economics International ("LEI") was engaged by the New York Energy Consumers Council ("NYECC") to perform an analysis of potential impacts on electricity costs from proposed carbon legislation (Bill No. 1745) in New York City ("NYC"), which would impose limits on the use of fossil fuel and total energy usage for buildings in NYC.

For those buildings in NYC whose usage of fossil fuel is currently over the proposed limit, there are a few options. Notably, building owners can offset a portion of their fossil fuel usage through purchases of renewable energy, or invest in energy efficiency measures in order to reduce their overall usage of energy, including fossil fuel. Another measure that can be undertaken to reduce the reliance on fossil fuel is to convert some or all of the building systems to electricity. However, building electrification will cause an increase in electric demand will in turn will result in additional costs for all electricity consumers in NYC due to the need for additional generation resources to meet the additional demand, and a need for additional transmission/distribution infrastructure within ConEd's service territory in NYC.

1.1 Building electrification impact on electric demand

The first step in the process to estimate a range of costs due to building electrification is to estimate the impacts on NYC's peak electric demand, resulting from the conversion of building systems from fossil fuels to electricity in order to comply with the proposed limits.

LEI established a baseline fossil fuel consumption for buildings in NYC affected by the proposed legislation based on publicly available information. LEI then estimated the additional electric load that could result from building electrification, including several parameters and conversion factors in this calculation:

- the proposed fossil fuel usage limits on buildings based on their primary and other usages;
- potential reductions in energy usage from energy efficiency projects; and
- the relative efficiency of fossil fuel versus electric systems, mainly for space and water heating.

Finally, using seasonal and hourly consumption patterns, LEI estimated a range of additional peak demand quantities by analyzing a Base Case electrification scenario and several sensitivity sets of assumptions, varying the assumptions used for each of the parameters listed above.

For all scenarios, LEI assumed that building owners would invest in energy efficiency measures before contemplating conversion of heating systems to electricity since the existing LL87, which requires an audit and retro commissioning every 10 years, will help building owners identify cost effective energy efficiency retrofits to improve the energy performance of their buildings gradually over time between now and 2035.

In the Base Case, LEI assumed that buildings are able to meet 50% of the average energy efficiency gains that have been identified in past energy audit recommendations; LEI then assumed that those buildings which are still over the proposed fossil fuel usage limits will convert their systems

to electric usage. LEI's sensitivity cases 1 through 3 assume varying levels of energy efficiency gains. Finally, Case 4 is similar to the Base Case but with the assumption that the technological advancements assumed in the Base Case for electric space and water heating efficiency rates are not achieved,[1] leading to 50% lower efficiency rates than in the Base Case. Figure 1 summarizes LEI's modeling scenarios.

Figure 1. Summary of modeling scenarios

Modeling scenarios	
Base Case	Buildings are able to meet 50% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 1 20% of energy efficiency targets	Buildings are able to meet 20% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 2 100% of energy efficiency targets	Buildings are able to meet 100% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 3 150% of energy efficiency targets	Buildings are able to meet 150% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 4 Lower electric heating efficiency	Same assumptions as Base Case, but efficiency rates for electric space heating (COP) and water heating (EF) are 50% lower than in Base Case

As illustrated in Figure 2, total additional NYC winter peak load resulting from building electrification is approximately 7,210 MW in LEI's Base Case, and ranges from 4,826 MW to 14,420 MW in the various sensitivity scenarios.[2]

Figure 2. Total incremental winter peak load in NYC from building electrification (MW)

MW	Incremental winter peak load		
	Residential	Commercial	Total
Base Case	3,695	3,515	7,210
Case 1	4,026	3,768	7,794
Case 2	2,747	3,123	5,870
Case 3	2,159	2,667	4,826
Case 4	7,391	7,029	14,420

For comparison purposes, the winter peak load in NYC for 2017 was 7,822 MW while the summer peak load was 10,241 MW. The 2035 forecast values are 7,396 MW and 11,458 MW for the winter

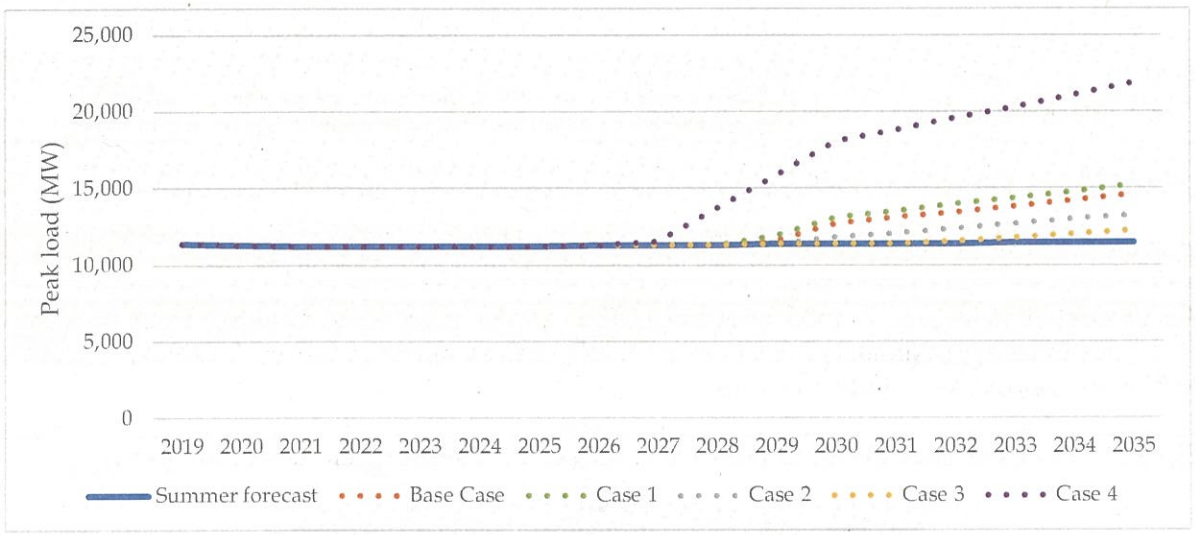
[1] It is LEI's understanding that large heat pump technology is not currently commercially available for use in large commercial or institutional buildings. Should the expected technological developments be delayed and efficiency values lower than those assumed in LEI's Base Case, the impact of building electrification on NYC load could be higher.

[2] The incremental peak load values are based on LEI's analysis of impact from electrification of existing buildings, and do not take into account new buildings, electric vehicles, or other factors which can impact electric demand.

and summer NYC peak loads.[3] As such, by 2035, NYC would become a winter-peaking region since the additional winter load on top of the forecast winter peak load (7,210 MW + 7,396 MW = 14,606 MW in the Base Case) would then surpass the summer peak load (11,458 MW).

In Figure 3 below, the solid blue line represents the current NYC (summer peaking) peak load forecast, absent any additional building electrification as a result of Intro 1745, which we can consider a "baseline". Under the various building electrification scenarios, the annual peak load starts diverging from the baseline from 2027-2029, increasing until 2035.

Figure 3. NYC annual peak load following building electrification



Source: NYISO 2018 Load and Capacity Data report; LEI

Furthermore, LEI's analysis shows that additional electric load in NYC resulting from building electrification could range from 4.2 TWh to approximately 13.4 TWh annually by the time the proposed limits are enforced (2030 to 2035). Considering New York State's Clean Energy Standard mandating that 50% of the state's load be served by renewable energy by 2030, this would result in an additional 2.1 TWh to 6.7 TWh of renewable energy required. If however the increased load from building electrification is realized faster than the additional renewable energy can come online, this could result in a temporary uptick in carbon emissions in NYC.

1.2 Building electrification impact on capacity and transmission costs for NYC consumers

In order to meet the increased peak demand in NYC, new resources would need to come online such as generation resources, interruptible load, or transmission infrastructure. When foreseeing such a need, NYISO's goal is to stimulate market response through appropriate capacity market price signals to ensure sufficient resources are available to meet peak load. As such, NYC

[3] NYISO. "2018 Load and Capacity Data". April 2018

consumers would not need to directly fund the construction of new generation capacity, or alternatives such as external controllable lines. Rather, the market construct dictates that Load Serving Entities ("LSE") must procure an amount of capacity product from the capacity market (through auctions or bilateral contracts) consistent with their share of the installed capacity requirement, then distribute costs among consumers through electric rates. If Intro 1745 were to be adopted as proposed, the increasing NYC peak load in the late 2020s would translate into a larger quantity of capacity resources clearing the auctions, at a price sufficient to incentivize construction of new in-city resources. This would thus result in a higher overall cost for capacity resources for NYC consumers.

In order to estimate additional capacity costs, LEI prepared an outlook of capacity market drivers until 2035 under the baseline conditions, as well as for the various building electrification scenarios.[4] Figure 4 illustrates the total capacity costs, and resulting average capacity price, for NYC consumers for 2030 and 2035.[5] The figure also illustrates the overall cost of capacity, and prices, for NYC consumers under the various scenarios related to building electrification.

Figure 4. NYC consumers capacity costs under various scenarios

		Baseline	Building electrification scenarios				
			Base Case	Case 1	Case 2	Case 3	Case 4
2030	Total capacity cost [$ billion]	$1.39	$2.33	$2.43	$2.13	$1.39	$3.57
	Peak load [MW]	11,346	12,666	13,084	11,800	11,346	18,028
	Capacity price [$/kW-yr]	$122.4	$183.9	$185.4	$180.5	$122.4	$198.2
	Increase from baseline		*50.2%*	*51.5%*	*47.5%*	*0.0%*	*61.9%*
2035	Total capacity cost [$ billion]	$1.62	$3.12	$3.27	$2.78	$2.51	$4.99
	Peak load [MW]	11,458	14,606	15,190	13,266	12,222	21,816
	Capacity price [$/kW-yr]	$141.4	$213.7	$215.4	$209.4	$205.4	$228.9
	Increase from baseline		*51.1%*	*52.3%*	*48.1%*	*45.2%*	*61.9%*

Under baseline conditions, i.e. without additional load from building electrification as a result of Intro 1745, the total cost of purchasing capacity for NYC consumers would be $1.39 billion in 2030, and $1.62 billion in 2035 (nominal dollars). Assuming that Intro 1745 is adopted as proposed, the annual capacity costs for NYC consumers would increase to $2.33 bllion, resulting in an average capacity price increase of 50% in 2030 for the Base Case scenario, and range from no change to as high as $3.57 billion (62% price increase) in the various sensitivity analyses. The relatively small difference in price increase between the sensitivity scenarios is due to the fact that

[4] See Section 5.2 and appendix B for more details on LEI's methodology and assumptions.

[5] Total capacity costs and average capacity price include the sum of costs for NYC consumers to purchase in-city capacity to meet the NYC Locational Capacity Requirement ("LCR"), together with additional capacity purchased in the G-J locality to meet the G-J LCR and additional capacity purchased in the NYCA zone to meet the overall statewide installed capacity requirement.

the NYC capacity price reaches the net Cost of New Entry ("net CONE") level,[6] incentivizing the construction of new resources to maintain the resource adequacy reliability standard. There would also be a capacity price increase for New York State consumers outside of NYC, as discussed in the body of this report.

To accommodate a large increase in end-use electric demand, the Transmission and Distribution ("T&D") network in the City would also need to be upgraded and expanded to meet reliability needs. LEI reviewed past ConEd infrastructure development plans to estimate increased T&D costs due to building electrification.

As depicted in Figure 5, LEI estimated incremental T&D investment costs of $11.11 billion in the Base Case, and ranging from $2.70 billion in Case 3 to as much as $36.55 billion in Case 4. ConEd would spread out the investment over a period of years prior to 2035, so that the T&D system is ready by the time the full additional load from building electrification is realized. Using a generic annualization factor to convert the investment cost into annual revenue requirement for ConEd, LEI estimated that annual costs for NYC consumers from 2035 onward could represent $1.44 billion in the Base Case, and range from $0.35 billion in Case 3 to $4.75 billion in Case 4.

Figure 5. Estimated NYC transmission and distribution costs due to building electrification

	Incremental Peak Load (MW)	Total T&D costs ($ billion)	Annual T&D costs ($ billion)
Base Case	3,148	$11.11	$1.44
Case 1	3,732	$13.17	$1.71
Case 2	1,808	$6.38	$0.83
Case 3	764	$2.70	$0.35
Case 4	10,358	$36.55	$4.75

Note: LEI annualized the T&D investment costs using a generic 13% factor, which is meant to cover financing costs as well as O&M costs for the transmission investment

Should Intro 1745 be adopted as proposed, T&D upgrade costs in NYC will be necessary to accommodate an increase in peak load caused by building electrification. While the above calculation of potential T&D costs is a very high-level approximation, it is apparent these costs are significant and could potentially be higher than the cost related to additional generation infrastructure.

[6] Net CONE represents the annualized cost of constructing and operating a generic peaking plant, minus expected annual energy and ancillary service revenues.

contact:
Gabriel Roumy/Ian Chow
617-933-7225
gabriel@londoneconomics.com

2 Summary of proposed legislation

On October 31, 2017, New York City council introduced legislation known as Intro 1745, which would impose limits on the use of fossil fuel and energy for buildings in NYC.[7] The legislation would affect "covered buildings", which is a definition that has been used for other green building legislation. It includes buildings which exceed 25,000 gross square feet, two or more buildings on the same tax lot or shared condominium ownership which exceed 100,000 gross square feet, and city buildings.[8] The legislation, if adopted as proposed, would come into effect January 1, 2030 for buildings which do not have any rent-regulated units, and January 1, 2035 for those that do.

Figure 6. Proposed fossil fuel use limits (all values per square feet)

Occupancy Group	kBTU/yr
A: Assembly (eg restaurants, stadiums, houses of worship)	60
B: Business (eg offices, banks, professional services)	35
E: Educational (eg schools, libraries)	45
F: Factory and Industrial or B: non-production laboratory	80
B: Civic administrative facility for emergency response services, I-1: Supervised residential (eg halfway houses) or I-4: Custodial care facilities (eg day nurseries)	50
H: High Hazard (eg sales and storage of flammable liquids), I-2: 24 hour medical related buildings (eg hospitals or nursing homes) or I-3: Correctional centers	100
M: Mercantile (eg retail stores and markets)	45
R: Residential that does not contain any rent-regulated units or affordable units	50
R: Residential that contains one or more affordable units and no rent-regulated units	55
R: Residential that contains one or more rent-regulated units	To be established
R: Residential that (i) contains no rent-regulated units and (ii) is receiving steam produced within a separate building or producing steam for use in two or more buildings that are in existence as of January 1, 2018	70

Source: City of New York. USE AND OCCUPANCY CLASSIFICATION. <https://www1.nyc.gov/assets/buildings/apps/pdf_viewer/viewer.html?file=2014CC_BC_Chapter_3_Use_and_Occupancy_Classification.pdf&section=conscode_2014>

In terms of fossil fuel use, the legislation places usage limits (in terms of thousands of British Thermal Units ("Btu"), or kBtu per year) on buildings, which vary depending on the occupancy

---

[7] The New York City Council. *Int 1745-2017.* <http://legistar.council.nyc.gov/LegislationDetail.aspx?ID=3199728&GUID=C3B86314-67AF-4037-B8CD-2CA4C10E631D&Options=ID%7CText%7C&Search=1745>

[8] New York City Administrative Code. *§ 28-308.1 Definitions.* <http://library.amlegal.com/nxt/gateway.dll/New%20York/admin/title28newyorkcityconstructioncodes/chapter3maintenanceofbuildings?f=templates$fn=default.htm$3.0>

group of the building, as per New York City building code. Buildings with multiple occupancy groups develop a weighted average limit, based on the conditioned floor area usage.[9] As shown in Figure 6, residential buildings (no rent regulated and one or more affordable units) would be limited to 55 kBtu/yr (50 kBtu/yr if no rent regulated or affordable units), businesses would be limited to 35 kBtu/yr, while factories would be limited to 80 kBtu/yr. Buildings with rent-regulated residential units will have targets set by January 1, 2021.

In addition to reducing fossil fuel use, buildings will be able to offset their usage up to 9% by generating energy from renewable sources ("green energy"), purchasing green energy from offsite, or investing in green energy systems. Also, if the building is in compliance with New York City lighting standards, buildings will be able to offset fossil fuel use by 1%.

The legislation also details whole building energy targets and directs targets and penalties to be developed by January 1, 2021. If no such limit is developed, the limit would become the Energy Star rating of the sixtieth percentile of a similar building in 2016. However, the fossil fuel use limit section of the legislation is expected to have the greatest impact on electrification of buildings and therefore LEI will focus its modeling efforts on those proposed limits on fossil fuel use.[10]

---

[9] Conditioned floor area defined in the NYC Energy Conservation Code as the horizontal projection of the floors of the area within a building which is directly or indirectly heated or cooled using fossil fuel or electricity. < https://www1.nyc.gov/assets/buildings/apps/pdf_viewer/viewer.html?file=2016ECC_CHR2.pdf&section=energy_code_2016>

[10] LEI understands that a new version of the legislation is being discussed (the REBNY-NRDC-Urban Green joint proposal), however LEI's analysis focused on the language of Intro 1745 as proposed.

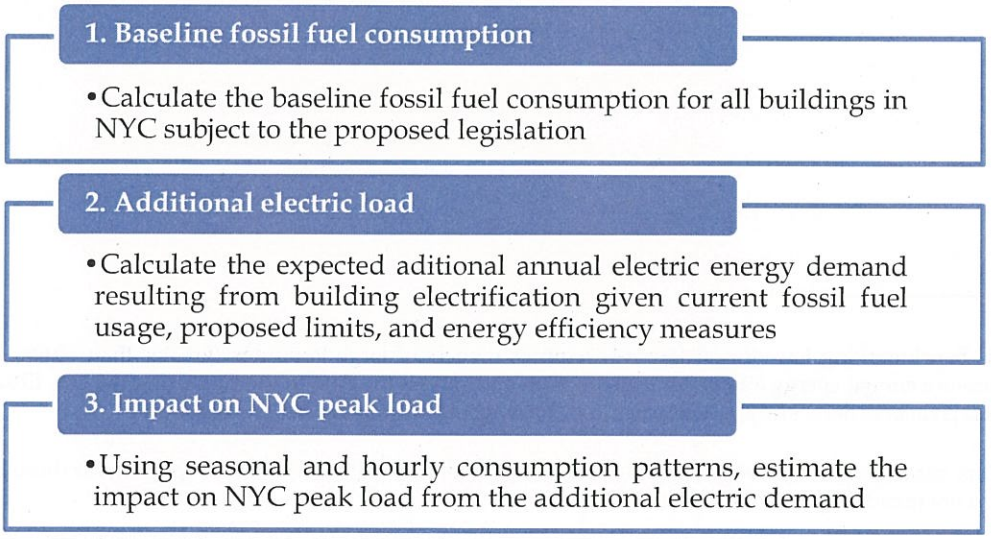
3 Estimate of building electrification impact on NYC electric demand

For those buildings in NYC whose usage of fossil fuel to power their systems is currently over the proposed limit, there are a few options. As mentioned in the summary of the proposed legislation (Section 2), building owners can offset up to 10% of their fossil fuel usage through generation or purchase of green energy, and being in compliance with the City's lighting standards. In addition, building owners can invest in energy efficiency measures in order to reduce their overall usage of energy, including fossil fuel. Finally, a final measure that can be undertaken to reduce the reliance on fossil fuels is to convert some or all of the building systems to electricity.

Since New York State adopted the Clean Energy Standard in 2017, mandating that 50% of the State's load be served by renewable resources by 2030, it is reasonable to assume that building electrification will result in a decrease in greenhouse gas emissions, as stated in the proposed legislation. However, system conversion will result in additional costs for building owners, and a sharp increase in electric demand will also result in additional costs for all NYC electricity consumers due to the need for additional generation resources, and T&D system reinforcements.[11]

The first step of the process to calculate this range of costs is to estimate a range of possible impacts on NYC's peak electric demand, resulting from the conversion of building systems from fossil fuel to electricity in order to comply with the proposed limits. The methodology and results from this first step are the focus of this section. LEI's methodology to calculate the impact of building electrification on peak load includes three major steps, as illustrated in Figure 7.

Figure 7. Methodology to estimate peak load impacts from building electrification



[11] LEI did not study the cost, or perform any cost-benefit analysis, of converting the building systems to electricity for building owners as that task falls outside its mandate.

3.1 Baseline fossil fuel consumption

To determine the baseline fossil fuel consumption for NYC buildings, LEI used the City's Energy and Water Data Disclosure for calendar year 2016.[12] The data contains comprehensive information on the consumption of fuel oil #1, fuel oil #2, fuel oil #4, fuel oil #5 and #6 (grouped), diesel, district steam, natural gas, and electricity use for buildings that are greater than or equal to 50,000 square feet.[13,14] When analyzing the data, LEI used a data cleaning methodology to remove data that had source Energy Use Intensities ("EUI") above two standard deviations. The data cleaning methodology is explained in the appendix A (Section 7.1).

Energy use data for buildings between 25,000 and 50,000 square feet is not yet available through the City's LL84 efforts. As a result, LEI extrapolated the energy consumption of these buildings by determining their total square feet, then applying the average site EUI by fuel type obtained through from the dataset described above. The methodology to determine the contribution of mid-sized buildings is further explained in Appendix A (Section 7.2).

The total annual fossil fuel use for buildings subject to the proposed legislation in NYC is approximately 137,883,849 million Btu ("MMBtu"), primarily driven by natural gas (110.6 million MMBtu) use as shown in Figure 8. Fuel oil #2 and #4 follow suit with 14.2 million MMBtu and 11.0 million MMBtu respectively. Current use of fuel oil #5 and #6 totals 2.0 million MMBtu and a small portion of buildings continue to use fuel oil #1 and diesel, together totaling less than 0.1 million MMBtu per year.

For comparison purposes, other sources of energy for NYC buildings subject to the proposed legislation include district steam (20.5 million MMBtu) and electricity (95.7 MMBtu) annually.

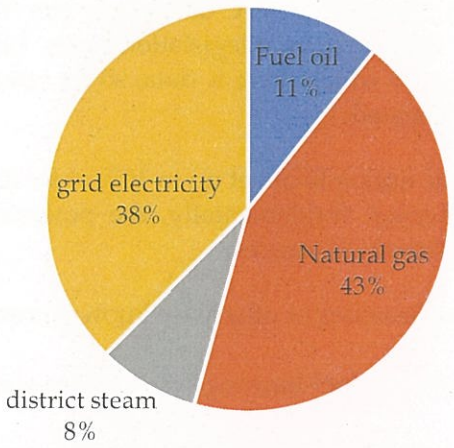
---

[12] The NYC Benchmarking Law (Local Law 84) requires owners of large buildings (greater than 50,000 sq. ft.) to measure annual energy and water consumption and submit the data to the City using the U.S. EPA's online tool. Available here: <http://www.nyc.gov/html/gbee/html/plan/ll84_scores.shtml>

[13] The data for certain buildings below 50,000 sf is also included, although in 2017 data reporting for those buildings was not mandatory.

[14] The Energy and Water Data Disclosure is the most comprehensive information available but the data is only inclusive of buildings complying with the benchmarking law. NYC reported that compliance with LL84 has continued to improve and in 2015, 90% of buildings required to benchmark submitted data. LEI is cognizant that this dataset is not a complete representation of NYC buildings and data for up to 10% of buildings may be absent in the 2017 Energy and Water Data Disclosure.

Figure 8. Current energy consumption by NYC buildings as of 2016



Source: NYC 2017 Energy and Water Data Disclosure (Data for Calendar Year 2016), edited and supplemented as described in Appendix A

The current fossil fuel usage of 137.8 million MMBtu for buildings affected by the proposed legislation has an average fossil fuel EUI of approximately 55.3 kBtu per square feet. This value can be compared against the proposed limits on fossil fuel usage, ranging from 35 to 70 kBtu/per square feet for the most common types of buildings (residential and business), to give an idea of the magnitude of the reduction contemplated.

3.2 Additional electric load

Having established the baseline fossil fuel consumption for buildings in NYC, LEI then estimated the additional electric load that could result from building electrification.[15] For this analysis, LEI assumes full compliance of buildings with limits set forth in the proposed Intro 1745.

LEI included several parameters and conversion factors in this calculation, including:

- the proposed fossil fuel usage limits on buildings depending on their primary and other usages;
- potential reductions in energy usage from energy efficiency projects; and
- the relative efficiency of fossil fuel versus electricity, mainly for space and water heating.

[15] LEI analyzed the impact from electrification of existing buildings, and as such did not take into account new buildings, electric vehicles, or other factors which can impact electric demand.

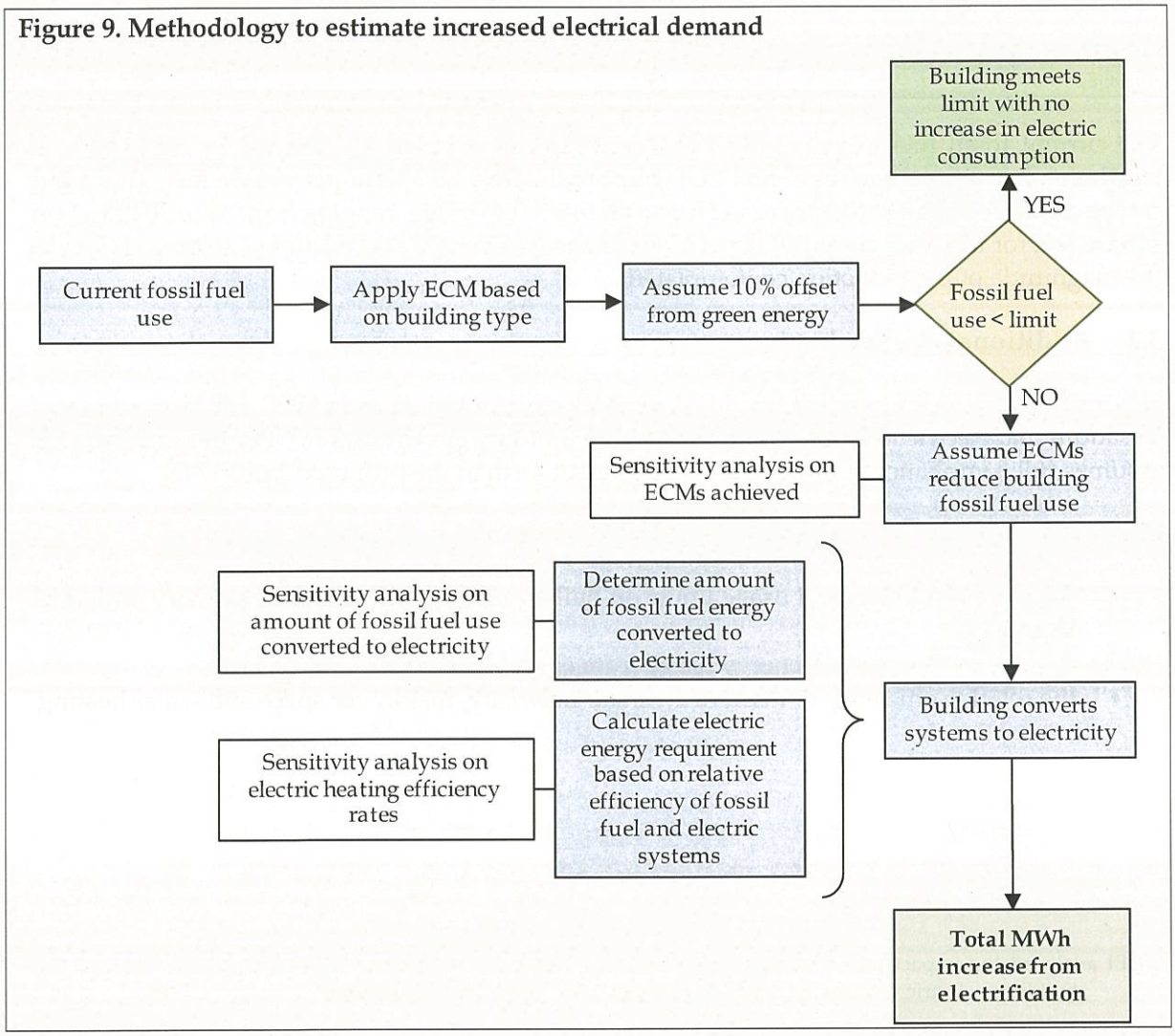
3.2.1 Methodology

To explore the potential increase in electric energy use due to building electrification, LEI used the baseline fossil fuel consumption from the NYC data disclosure then applied various metrics to lower the fossil fuel use to meet the proposed legislation limits. LEI applied the methodology described below to each building for which there is data, so all calculations are at the building level and the results are then aggregated.

The proposed legislation offers the option to offset up to 10% of fossil fuel consumption through purchases of green energy. However, fundamentally, the potential reductions in fossil fuel consumption by buildings come from two sources:

1. through energy efficiency measures or otherwise known as energy conservation measures ("ECM"); and
2. through the conversion of fossil fuel-burning systems into electric systems.

Figure 9. Methodology to estimate increased electrical demand



LEI assumed that if building owners can meet the proposed limits on fossil fuel use through green energy purchase offsets and ECMs, then they would opt for that option rather than converting systems to electricity. Indeed, the requirements under the existing LL87, which requires an audit and retro commissioning every 10 years, will help building owners identify cost effective energy efficiency retrofits to improve the energy performance of their buildings gradually over time between now and 2035. [16]

For buildings that cannot comply through the green energy offsets and ECMs, LEI assumed that building owners would still first opt for ECMs as they are generally a more cost-effective solution to reduce energy use versus conversion. Any remaining fossil fuel usage above the proposed limits once ECMs are in place would then lead to a conversion of systems to electricity, as illustrated in Figure 9 above.

Possible energy usage reductions that can be achieved through ECMs for various types of buildings are shown in Figure 10 and Figure 11 below, which were derived by the NYC Technical Working Group based on Local Law 87 energy audit recommendations.[17] Modeled ECM scenarios are described in Section 3.2.2. Note the average reductions shown typically include only the most cost-effective ECM measures with paybacks of less than 10 years, meaning that not all efficiency opportunities are included.

Figure 10. Energy usage reductions from ECMs for residential and commercial building types

Building type	Built year	Reductions through ECM
Multifamily	post-1980	10%
Multifamily	1945 to 1980	14%
Multifamily	pre-1945	15%
Commercial	post-1980	15%
Commercial	1945 to 1980	14%
Commercial	pre-1945	10%

[16] Note that any financial support from the government for ECMs would ultimately be funded indirectly by New York consumers and businesses through ratepayer surcharges or tax increases, though it is likely that policymakers would try to minimize total incremental costs to the extent possible.

[17] The City of New York. *One City Built to Last Technical Working Group Report.* 2015. Available here: < http://www.nyc.gov/html/gbee/html/one-city/technical-working-group.shtml>

contact:
Gabriel Roumy/Ian Chow
617-933-7225
gabriel@londoneconomics.com

Figure 11. Energy usage reductions from ECMs for industrial and institutional building types

Building type	Building use	Reductions through ECM
Industrial	warehouse/factory	15%
Industrial	transport/garage/utilities	25%
Institutional	General	16%
Institutional	Hospitals & Health	9%
Institutional	K-12	13%
Institutional	Religious	16%
Institutional	University	5%

Source: NYC TWG report

Once the ECMs are applied to the baseline fossil fuel usage, the reduced usage is compared to the maximum fossil fuel limit. The maximum fossil fuel limit is calculated by multiplying the buildings' total square footage by the limit outlined in the proposed legislation as shown in Figure 12. If a building has more than one type of use (i.e. contains multiple occupancy groups), a weighted average of the proposed limit is calculated.[18]

Figure 12. Simplified legislation limits for modeling purposes

Occupancy group	Proposed limit (kBtu/sq. ft./year)
Assembly	60
Business	35
Educational	45
Factory	80
Civic	50
High Hazard	100
Mercantile	45
Residential	55
Other	50

Source: Intro 1745

If a building's fossil fuel usage is lower than the limit through ECMs only, the building theoretically does not need to electrify its fossil fuel systems. However, if the fossil fuel usage is higher than the maximum limit, the building must find alternatives to further reduce its fossil fuel use. Thus, the next process in the model looks at converting the buildings' fossil fuel-use systems to electric systems.

If a building's fossil fuel usage is greater than the proposed limit through ECMs only, the building must electrify its entire fossil fuel systems. LEI assumed partial conversion of fossil fuel systems

[18] It is LEI's understanding from the proposed legislation language that this is how the limits would be calculated for buildings with multiple occupancy groups.

is not possible and building owners would opt to convert its entire system if needed. The total reduction in fossil fuel use in this step represents the conversion of fossil fuel to electric systems.

To translate fossil fuel consumption to electricity demand, the relative efficiencies of fossil fuel systems versus electric space heating and water heating were used. For fossil fuels, LEI relied on annual fuel utilization efficiency ("AFUE") values as calculated by the U.S. Department of Energy National Renewable Energy Laboratory ("NREL"); this value essentially represents the ability to convert fuel energy into heating energy.[19] According to the NREL report, fuel oil and diesel have an approximate AFUE of 70% while natural gas has an AFUE of 80%. By applying the AFUE against the total fossil fuel reduction, LEI estimated the actual heat required from fossil fuel (in kBtu).

Similarly, LEI used the NREL report to get electric energy coefficients of performance ("COP") for space heating and energy factors ("EF") for water heating, as shown in Figure 13. The COP and EF are measures of electric heating efficiency, and are directly comparable to the fossil fuel AFUE values. These efficiency numbers show that electric heating (space or water) is generally more efficient than heating with fossil fuel, as an electric heat pump can leverage the thermal content of outside air even in the winter time.

Figure 13. Electrical heating system efficiency ratings in 2030, moderate advancement

Building type	Space heating (COP)	Water heating (EF)
Residential	2.75	3.5
Commercial	2.5	3.25
Industrial	2.5	3
Institutional	2.5	3
Other	2.5	3

Source: NREL

LEI's use of the NREL values is conservative, since these COP and EF values are the result of technological developments expected to occur in the next ten years; it is LEI's understanding that large heat pump technology is not currently commercially available for use in large commercial or institutional buildings. Should the expected technological developments be delayed and COP/EF values lower than those shown in Figure 13, the impact of building electrification on NYC load could be higher (this possibility is studied as a sensitivity analysis, as discussed in the next section).

Current fossil fuel use in buildings is primarily used for space heating and water heating. To determine the breakdown between fossil fuel use, LEI analyzed annual fossil fuel consumption for various building types. The breakdown of fossil fuel use for space heating and water heating is shown in Figure 14. Generally speaking, residential buildings use slightly more energy for

[19] NREL. "Electrification & Decarbonization: Exploring U.S. Energy Use and Greenhouse Gas Emissions in Scenarios with Widespread Electrification and Power Sector Decarbonization". July 2017.

space heating (as opposed to water heating), while other building types use the majority of energy for space heating.

Figure 14. Ratio of fossil fuel use for space and water heating

Building type	Fossil fuel use for space heating	Fossil fuel use for water heating
Residential	53%	47%
Commercial	72%	22%
Industrial	100%	0%
Institutional	84%	7%
Other	77%	19%

Source: OpenEI data analysis

3.2.2 Modeling scenarios

LEI calculated a range of possible building electrification scenarios, and the consequential impact on the NYC electric demand. LEI's Base Case set of assumptions represents the most realistic outcome, while the sensitivities show results with varying success of energy efficiency improvements, and a case that assumes lower efficiency for space and water heating. The assumptions related to each of these cases are illustrated in Figure 15.

Figure 15. Summary of modeling scenarios

Modeling scenarios	
Base Case	Buildings are able to meet 50% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 1 20% of energy efficiency targets	Buildings are able to meet 20% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 2 100% of energy efficiency targets	Buildings are able to meet 100% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 3 150% of energy efficiency targets	Buildings are able to meet 150% of the average energy efficiency gains from energy audit recommendations; buildings electrify if they are over the limit
Case 4 Lower electric heating efficiency	Same assumptions as Base Case, but efficiency rates for electric space heating (COP) and water heating (EF) are 50% lower than in Base Case

For the Base Case scenario, LEI assumed that on average, building owners will first invest in energy efficiency measures, yielding a reduction in energy usage for their buildings equivalent to 50% of the average energy reduction illustrated in Figure 10 and Figure 11. LEI assumed that building owners whose property is still above the proposed fossil fuel usage limit would reduce their reliance on fossil fuels through electrification of their fossil fuel systems.

For Case 1, LEI assumed that building owners would on average implement energy efficiency measures that are equivalent to 20% of the average energy efficiency measures recommended in the LL87 energy audits. This represents the minimum energy efficiency measures building owners would make which could be caused by a lack of financial support from government

institutions to invest in energy efficiency, or the inability of building owners to fully realize the theoretical gains.

For Case 2, LEI assumed that building owners would implement energy efficiency measures that are equivalent to 100% of the average energy efficiency measures recommended in the LL87 energy audits.

For Case 3, LEI assumed that building owners would implement energy efficiency measures that are equivalent to 150% of the average energy efficiency measures recommended in the LL87 energy audits. This represents a greater role of energy efficiency in reducing building energy use through enhanced financial support from the government.

In Case 4, LEI assumed that efficiency of the electric space and water heating systems is only 50% of the COP and EF values illustrated in Figure 13. This scenario assumes that the technological advancements forecast in the NREL report are not realized. The other assumptions are similar to the Base Case.

3.2.3 Results

In LEI's analysis, building electrification in the Base Case and all sensitivity cases ranges from around 22% to 38% in terms of total building square footage included in LEI's analysis.[20] In Case 3, the lowest number of buildings (approximately 3,994 buildings out of 14,489) electrified as a result of 150% of average energy efficiency gains. The highest level of building electrification occurred in Case 1 with 6,622 buildings electrifying, due to the smaller impact from assuming that buildings achieve 20% of average energy efficiency gains. Figure 16 summarizes the electrification of NYC buildings in all scenarios.

Figure 16. Building electrification results for LEI's Base Case and sensitivity cases

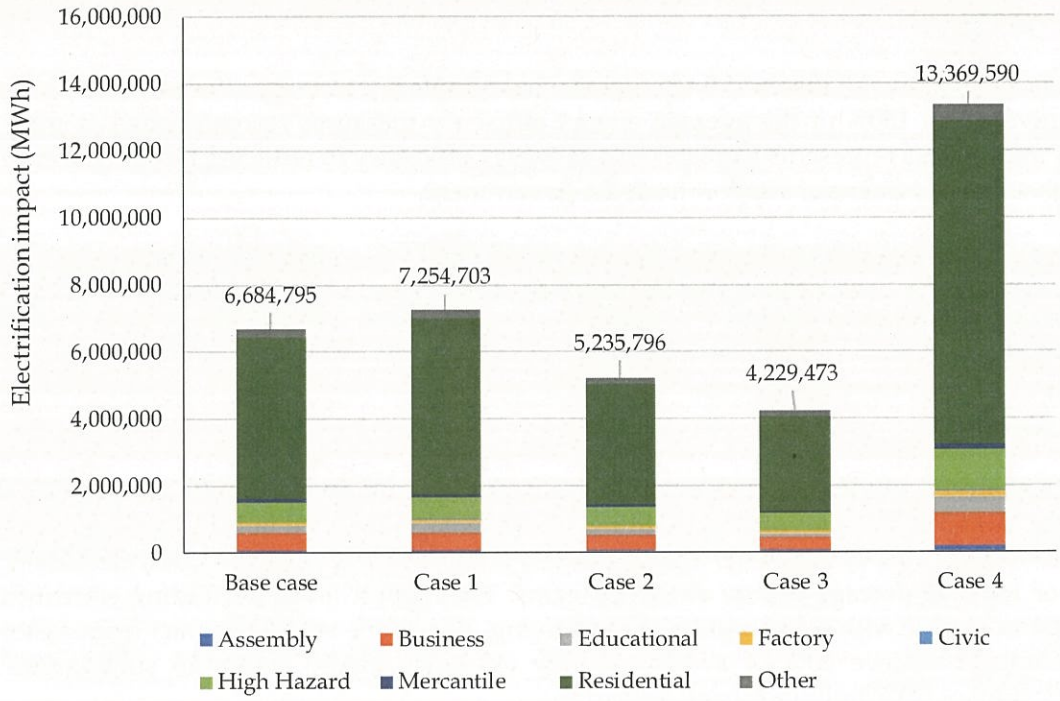
	No. of buildings that electrify	Percent of buildings that electrify	Total SF of buildings that electrify	Percent of SF of buildings that electrify
Base Case	6,103	42%	1,043,259,460	36%
Case 1	6,622	46%	1,108,653,405	38%
Case 2	5,125	35%	798,524,999	27%
Case 3	3,994	28%	646,963,759	22%
Case 4	6,103	42%	1,043,259,460	36%

For the Base Case and all sensitivity cases, LEI's analysis shows that additional electric load in NYC resulting from building electrification could range from 4.2 TWh to approximately 13.4 TWh by the time the proposed limits are enforced (2030 to 2035), as illustrated in Figure 17. For comparison purposes, the actual energy demand in NYC for 2017 was 52.3 TWh and the forecast

[20] Buildings 50,000 sf and more that complied with LL84 reporting requirements, plus estimate of buildings 25,000 to 50,000 sf.

for 2035 is 51.8 TWh.[21] Therefore the increase in demand could range from 8.1% to 25.9% of the forecast 2035 annual electric demand.

Figure 17. Additional annual electric demand from building electrification in NYC



3.3 Impact on NYC peak load

The incremental load resulting from the electrification of applicable NYC buildings is distributed across different times of day and seasons affecting the variability and shape of the prevailing load distribution. In this analysis, LEI assumed that the incremental electric load due to switching from fossil fuel to electricity for end-use services including water heating, space heating, and interior equipment use, will have a shape identical to the typical load shape of natural gas consumption for each building category. Indeed, LEI assumed that the natural gas consumption is representative of the consumption pattern for other fossil fuels since the end use is the same. Furthermore, since this study looks at converting fossil fuel usage into electricity usage, it is logical to rely on the current load shape for fossil fuel consumption as a proxy for the additional electricity load shape.

Accordingly, LEI determined the aggregate load shape for the incremental electric load by analyzing hourly gas consumption patterns of different building types in NYC and applying

[21] NYISO. "2018 Load and Capacity Data". April 2018

these patterns to the incremental electric energy required by the buildings affected by the proposed legislation.

In order to analyze the aggregate impacts on load distribution, LEI disaggregated the occupancy groups of buildings applicable to the legislation into two broad categories, namely, residential and commercial. Buildings whose primary property use type is residential such as multifamily housing and hotels are grouped under the residential category. All other nonresidential buildings are placed in the commercial category. Figure 18 below summarizes the occupancy groups of all buildings covered under the legislation and their corresponding categories.

Figure 18. Modeled residential and commercial categories and end-use services

	Residential	Commercial
Occupancy group	Residential	Business Educational Mercantile Civic Assembly High hazard Facory Other
End uses analyzed	Water heating Space heating Interior equipment use	

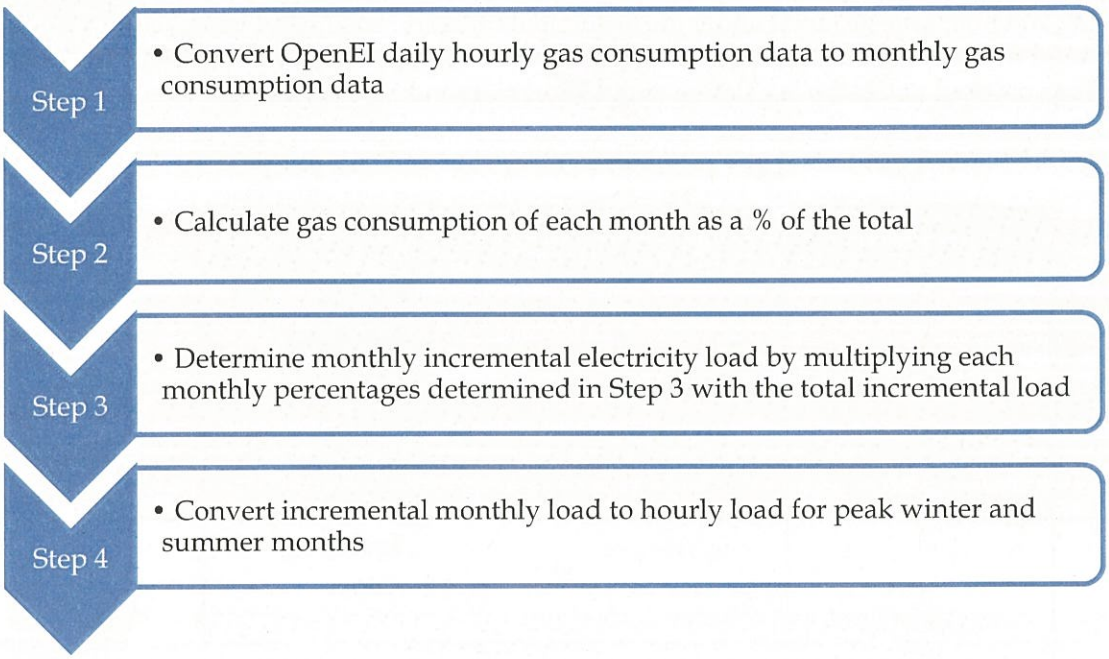
Using these categories, LEI determined the magnitude and shapes of the incremental electricity load by using datasets sourced from Open Energy Information ("OpenEI"), an open source online energy database run by the U.S. Department of Energy. Collected by the Office of Energy Efficiency and Renewable Energy ("EREE"), the datasets contain hourly load profile data for gas and electricity demand of residential buildings and 16 commercial building types in three Typical Meteorological Years ("TMY") locations in New York including Central Park, J.F. Kennedy International Airport, and LaGuardia Airport.[22] Given the significant similarity of gas load shapes for buildings across the three locations, this report uses the data collected for residential and commercial buildings in the Central Park TMY location.

Figure 19 below illustrates the series of steps followed to estimate a load shape for the incremental electricity due to the electrification of NYC buildings affected by the proposed limits on fossil fuel

[22] The TMY3 data sets are derived from the 1991-2005 National Solar Radiation Data Base (NSRDB) update. For more information, please refer to the TMY3 User's Manual <https://www.nrel.gov/docs/fy08osti/43156.pdf>

usage. Since heating requirement is not uniform on seasonal and hourly bases, the peak energy usage is much higher than the average energy usage. LEI applied these steps to each occupancy group under both categories of residential and commercial buildings.

Figure 19. Steps to determine the hourly load shape of incremental electricity



3.3.1 Residential buildings

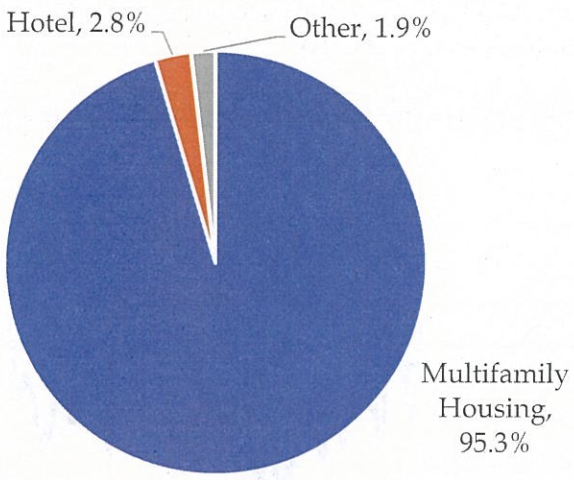
The residential occupancy group represents approximately 66% of all buildings affected by the proposed legislation. Within the residential category, "Multifamily Housing" represents the largest share of residential buildings, accounting for 95.3% of all buildings in the category. Figure 20 below shows the building types covered under the residential occupancy group and their corresponding proportions. It is important to remember that the proposed legislation applies only to large buildings, so that single family houses and smaller residential buildings are not represented in the dataset.

The incremental load analysis for buildings in the residential category uses OpenEI's base load benchmark data for residential buildings in the Central Park TMY location. The datasets are based on the Building American House Simulation Protocols and statistical references of Residential Energy Consumption Survey ("RECS") developed by the DOE and EIA, respectively.[23]

---

23 https://openei.org/doe-opendata/dataset/commercial-and-residential-hourly-load-profiles-for-all-tmy3-locations-in-the-united-states

Figure 20. Building types under the residential occupancy group

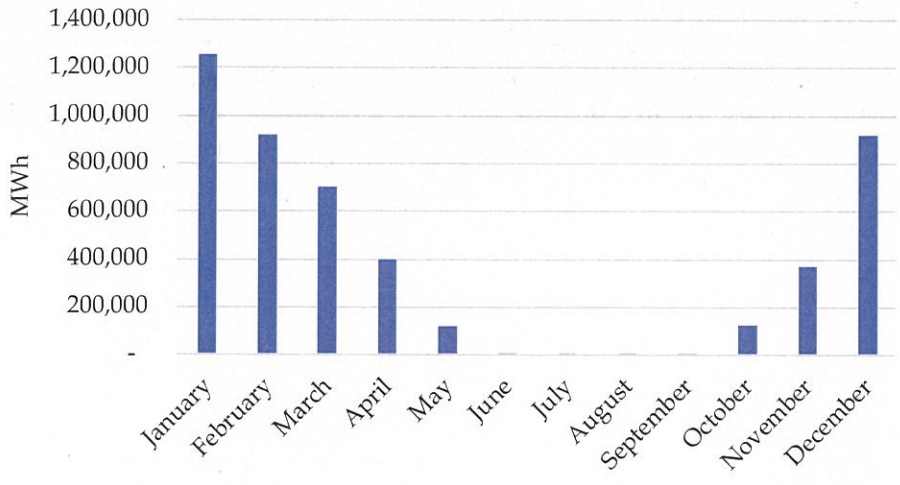


Note: The other category represents buildings whose largest property use type includes: "residence hall/dormitory", "other - lodging/residential", and "residential care facility"

3.3.1.1 Base Case analysis and results

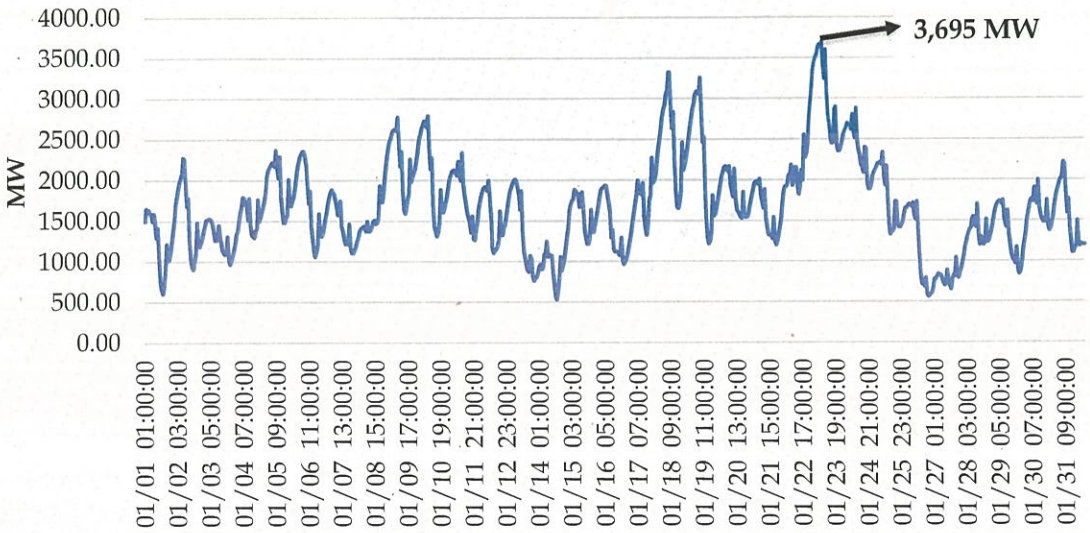
In the Base Case, the total incremental load for residential buildings is 4.8 TWh. LEI determined the monthly and corresponding hourly incremental electric load by applying the methodology noted in Figure 19. Figure 21 below shows a summary of the monthly incremental load from residential buildings. The months of December, January, and February account for approximately 64% (3.0 TWh) of the total increase in annual electrical demand with the month of January representing the highest increase at 26% of the total (1.2 TWh). On the other hand, the months of June, July, August, and September had the lowest values of incremental load representing just 0.3% (17 GWh) of the total incremental annual electrical demand.

Figure 21. Monthly incremental load for residential buildings



Based on the above results, LEI determined that the peak load occurs in the month of January and subsequently identified the highest hourly peak achieved in January based on the hourly TMY data. As noted in Figure 22 below, the incremental peak load due to the electrification of the residential category of buildings is 3,695 MW.

Figure 22. January hourly load profile for residential buildings (Base Case)

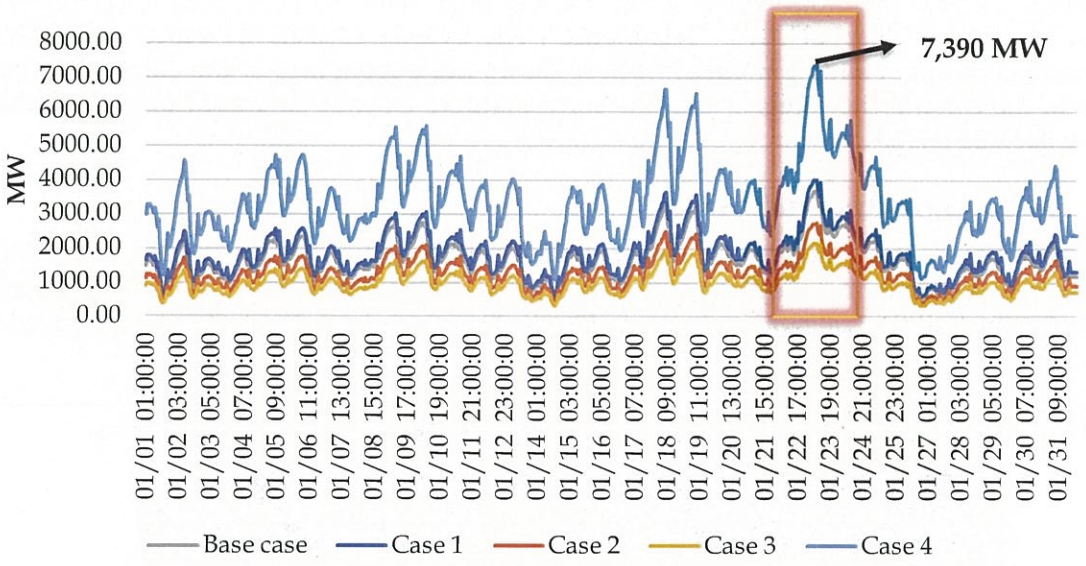


3.3.1.2 Sensitivity analysis

As mentioned in Section 3.2.2, LEI analyzed four sensitivities, in addition to the Base Case, to assess the impacts of factors including fossil fuel to electricity conversion rates, energy efficiency targets, and electric heating efficiencies on the total incremental load and corresponding monthly and hourly load profiles for residential buildings.

Similar to the Base Case, LEI determined the monthly and corresponding hourly incremental electricity loads by applying the methodology noted in Figure 19. With the understanding that the peak load occurs in the month of January, Figure 23 below illustrates the hourly load shapes for the Base Case and all four sensitivities. As noted in the highlighted area, the peak load occurs in the later part of January for all scenarios and Case 4 represents the highest incremental peak load of 7,390 MW compared to the Base Case incremental peak load of 3,695 MW.

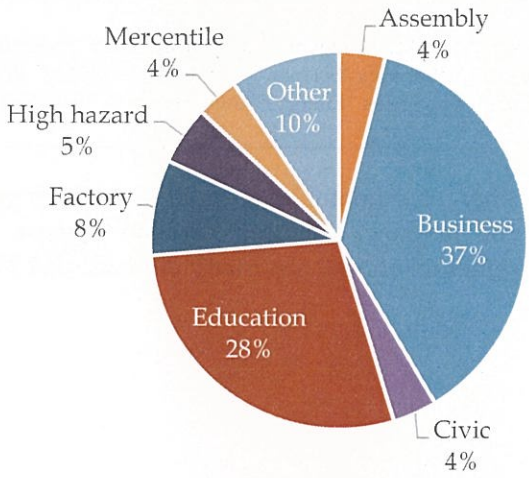
Figure 23. January hourly load profile for residential buildings (All sensitivities)



3.3.2 Commercial buildings

The commercial category represents eight occupancy groups accounting for the remaining 34% of NYC buildings affected by the proposed legislation. Within this category, the "Business" occupancy group represents the largest share of buildings representing 37.5% of all buildings in the category followed by "Education" representing 28.4%. Figure 24 below shows the different building types covered under the commercial category and their corresponding proportions.

Figure 24. Building types under the commercial occupancy group



Note: The other category represents buildings whose largest property use type includes: "Energy/Power Station", "Other", "Other - Public Services", "Other – Services", "Other - Technology/Science", "Other – Utility", "Parking", "Police Station", "Self-Storage Facility", and "Wastewater Treatment Plant"

Similar to the analysis conducted for the residential category, the incremental load analysis for occupancy groups in the commercial category uses OpenEI hourly gas consumption data specifically for five buildings types in the Central Park TMY location including: "Office", "School", "Retail", "Hospital", and "Warehouse". The OpenEI datasets are based on the DOE commercial reference building models.[24] below shows LEI's groupings of the eight occupancy groups in the commercial category and the corresponding OpenEI data used to analyze their incremental load shapes.

3.3.2.1 Base Case analysis and results

In the Base Case, the total incremental electric load for all commercial building types is 1.8 TWh. LEI determined the monthly and corresponding hourly incremental electric load using OpenEI datasets for the building categories shown in Figure 25 and applying the methodology noted in Figure 19.

Figure 25. Commercial occupancy groups and corresponding OpenEI categories

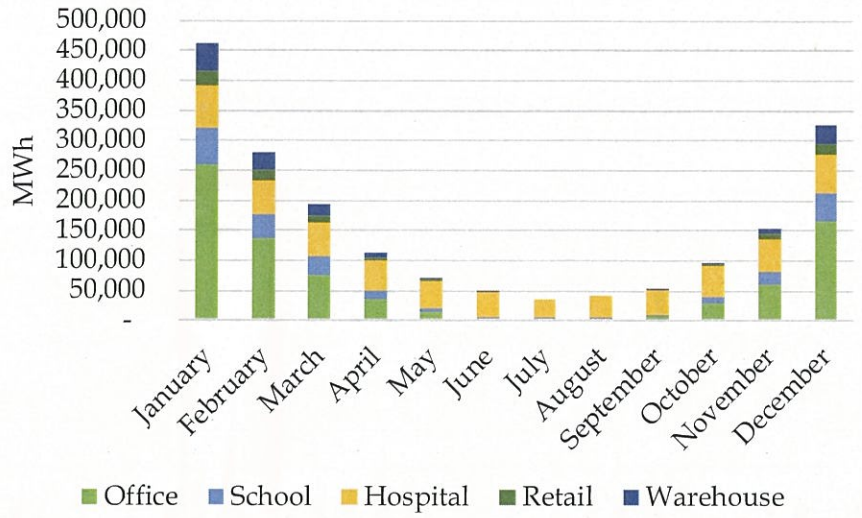
OpenEI category	Occupancy group	% Share of commercial buildings
Office	Business Civic Assembly Factory Other	59.2%
School	Education	28.4%
Hospital	High hazard	5.0%
Retail	Mercantile	3.6%
Warehouse	Other*	3.6%

Note: 1) The "Other*" occupancy group under the "Office" OpenEI category includes "Police Station", "Other", "Other - Public Services", "Other - Services", "Other - Technology/Science", and "Other – Utility" 2) The "Other*" occupancy group under the "Warehouse" OpenEI category includes "Energy/Power Station", "Parking", "Self-Storage facility", and "Wastewater Treatment Plant".

Figure 26 below illustrates the monthly incremental load for all occupancy groups under the five OpenEI categories. The month of January accounts for the largest share representing approximately 25% of the total incremental annual electricity demand (0.4 TWh).

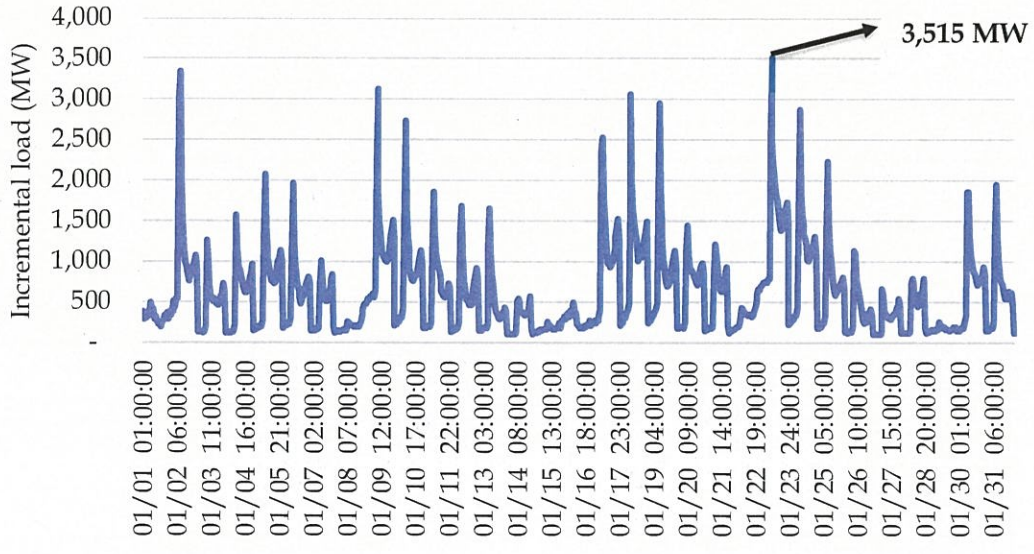
[24] Ibid

Figure 26. Monthly incremental load for commercial categories



Based on the above results, LEI determined that the peak load also occurs in the month of January for the commercial category of buildings and subsequently identified the highest hourly peak achieved in January based on the hourly TMY data. As noted in Figure 27 below, the incremental peak load due to the electrification of the commercial category of buildings is 3,515 MW.

Figure 27. January hourly load profile for all commercial buildings (Base Case)

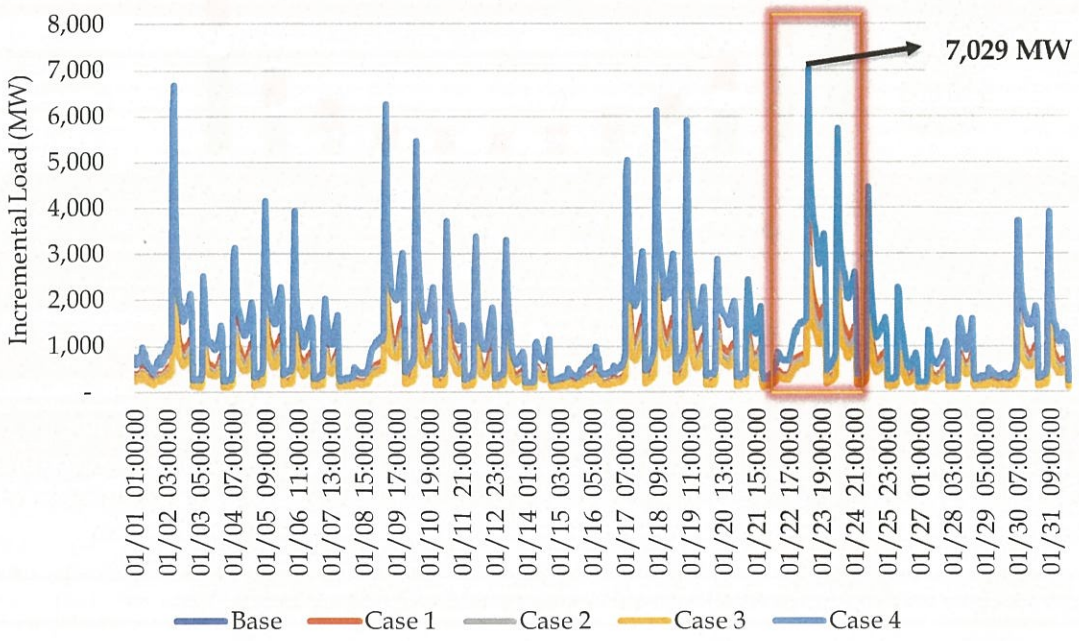


3.3.2.2 Sensitivity analysis

Similar to the Base Case, LEI determined the monthly and corresponding hourly incremental electricity loads by applying the methodology noted in Figure 19. With the understanding that

the peak load occurs in the month of January, Figure 28 below illustrates the hourly load shapes for the Base Case and all four sensitivities. As noted in the highlighted area, the peak load occurs in the later part of January for all scenarios and Case 4 represents the highest incremental peak load of 7,029 MW compared to the Base Case incremental peak load of 3,515 MW.

Figure 28. January hourly load profile for all commercial buildings (all sensitivities)



3.3.3 Consolidated results

During peak (i.e. coldest) winter season days, natural gas usage (which is used to represent the shape of the incremental electricity demand) in both residential and commercial buildings typically peaks in the morning around 8am. Accordingly, given the coincidental peaks of both building types, LEI determined the overall incremental electric peak load in NYC from building electrification by adding the incremental peak load from residential buildings and the incremental peak load from commercial buildings.

Figure 29. Incremental winter peak load in NYC from building electrification (MW)

MW	Incremental winter peak load		
	Residential	Commercial	Total
Base Case	3,695	3,515	7,210
Case 1	4,026	3,768	7,794
Case 2	2,747	3,123	5,870
Case 3	2,159	2,667	4,826
Case 4	7,391	7,029	14,420

In the Base Case, the incremental total peak load for NYC represent as much as 7,210 MW for a peak January day. Since electric resource adequacy must plan for peak conditions, the incremental load of 7,210 MW represents the additional peak load resulting from building electrification that would be added to the existing NYC winter peak load. In the sensitivity cases, the NYC winter peak load could increase from 7,794 MW to as much as 14,420 MW due to building electrification.

For comparison purposes, the winter peak load in NYC for 2016 was 7,822 MW while the summer peak load was 10,241 MW. The 2035 forecast are 7,396 MW and 11,458 MW for the winter and summer NYC peak loads respectively.[25] Under the current conditions, NYC, like the rest of the New York Control Area, is a summer-peaking region because of the air conditioning load. However, if heating load currently being met through fossil fuel sources is converted to electricity, then NYC would become a winter-peaking locality since the additional winter load, added to the forecast winter peak load (7,396 MW + 7,210 MW = 14,606 MW in the Base Case), would then surpass the summer peak load (11,458 MW).

[25] NYISO. "2018 Load and Capacity Data". April 2018

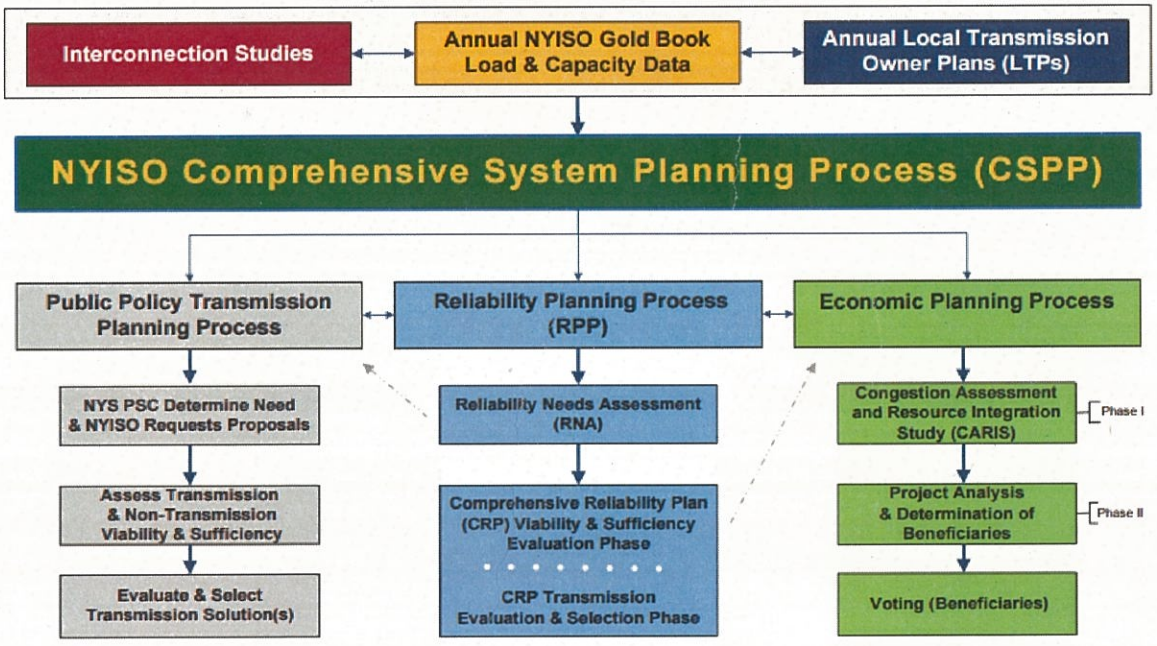
contact:
Gabriel Roumy/Ian Chow
617-933-7225
gabriel@londoneconomics.com

4 NYISO's Comprehensive System Planning Process

The proposed Bill No. 1745 will cause the electrification of many New York City buildings, which LEI forecasts will result in a significant increase in electricity demand. This additional demand is likely to require additional infrastructure, which is typically addressed through the NYISO's planning process. This section presents an overview of the NYISO's overall Comprehensive System Planning Process ("CSPP"), which governs this planning process. The CSPP takes into account both reliability needs and economic considerations. The process is comprised of the following components and is summarized in Figure 30 below:

1. Local Transmission System Planning Process ("LTPP")
2. Reliability Planning Process ("RPP");
3. Congestion Assessment and Resource Integration Study ("CARIS"); and
4. Public Policy Transmission Planning Process ("PPTPP").

Figure 30. NYISO Comprehensive System Planning Process



Source: NYISO

4.1 Local Transmission System Planning Process

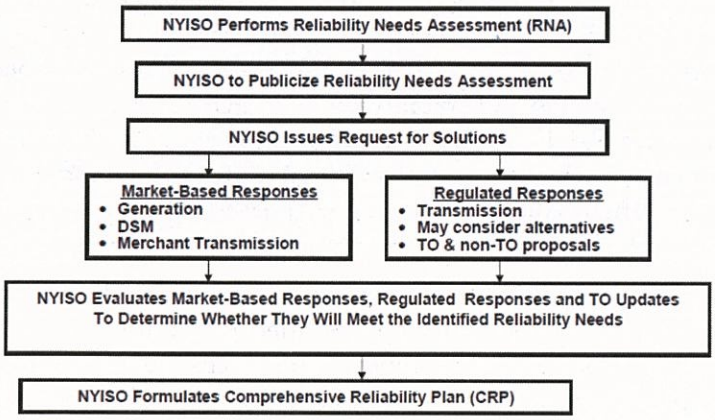
The LTPP is a step that provides input to the CSPP. As part of the LTPP, each Transmission Owner ("TO") performs transmission security studies for their Bulk Power Transmission Facilities ("BPTF") in their transmission areas according to all applicable criteria. These criteria are defined by the North American Electric Reliability Corporation ("NERC"), the Northeast Power Coordinating Council ("NPCC"), and the New York State Reliability Council ("NYSRC"). As part

of the LTPP, each TO posts its criteria and assumptions for review and comment by stakeholders. NYC's responsible TO is Consolidated Edison Company of New York ("ConEd"). It is expected that the increased demand forecast from electrification of New York City buildings would significantly impact ConEd's LTPP, which would then feed into the rest of the CSPP.

4.2 Reliability Planning Process

The RPP is anchored in the market-based philosophy of the NYISO and its Market Participants, which posits that market solutions should be the preferred choice to meet any reliability need identified during the planning process. During the RPP, the NYISO conducts the Reliability Needs Assessment ("RNA") to identify any potential reliability issue over the next ten years, and the Comprehensive Reliability Plan ("CRP") to identify solutions if needed. Figure 31 summarizes the RPP process.

Figure 31. NYISO Reliability Planning Process



Source: NYISO

The RNA is performed every two years and evaluates the adequacy and security of the BPTFs over a ten-year study period. For adequacy and security studies, NYISO develops a base case forecast for peak demand and energy, typically based off the latest Load and Capacity Data report (aka Gold Book). In identifying resource adequacy needs, the NYISO identifies the amount of resources in megawatts (MW, known as "compensatory MW") and the locations in which they are needed, if applicable. The RNA does not identify specific solutions to meet the needs.

Adequacy and Security

There are two different aspects to analyzing the Bulk Power Transmission Facilities ("BPTF") reliability in the RNA: adequacy and security. Adequacy is a planning and probabilistic concept. A system is adequate if the probability of having sufficient transmission and generation to meet expected demand is equal to or less than the system's standard, which is expressed as a loss of load expectation ("LOLE"). The New York State bulk power system is planned to meet an LOLE that, at any given point in time, is less than or equal to an involuntary load disconnection that is not more frequent than once in every 10 years, or 0.1 days per year. This requirement forms the basis of New York's IRM resource adequacy requirement.

Security is an operating and deterministic concept. This means that possible events are identified as having significant adverse reliability consequences. The system is planned and operated so that the system can continue to serve load even if these events occur. Security requirements are sometimes referred to as N-1 or N-1-1. N is the number of system components. An N-1 requirement means that the system can withstand single disturbance events (e.g., generator, bus section, transmission circuit, breaker failure, double-circuit tower) without violating thermal, voltage and stability limits or before resulting in unplanned loss of service to consumers. An N-1-1 requirement means that the Reliability Criteria apply after any critical element such as a generator, a transmission circuit, a transformer, series or shunt compensating device, or a high voltage direct current (HVDC) pole has already been lost.

Following approval of the RNA by its Board of Directors, if necessary, the NYISO issues a request for market-based and regulated solutions to the identified Reliability Needs. This process lasts for two to three months and is open to all types of resources, including generation, demand response and transmission. Note that the Responsible TO, typically the TO in whose service territory there is an identified reliability need, is obliged to submit a regulated solution. Private developers are also allowed to propose "Alternative Regulated Solutions". Each proposed solution is assessed in terms of their viability and sufficiency, in terms of their ability to satisfy the needs identified in the RNA.

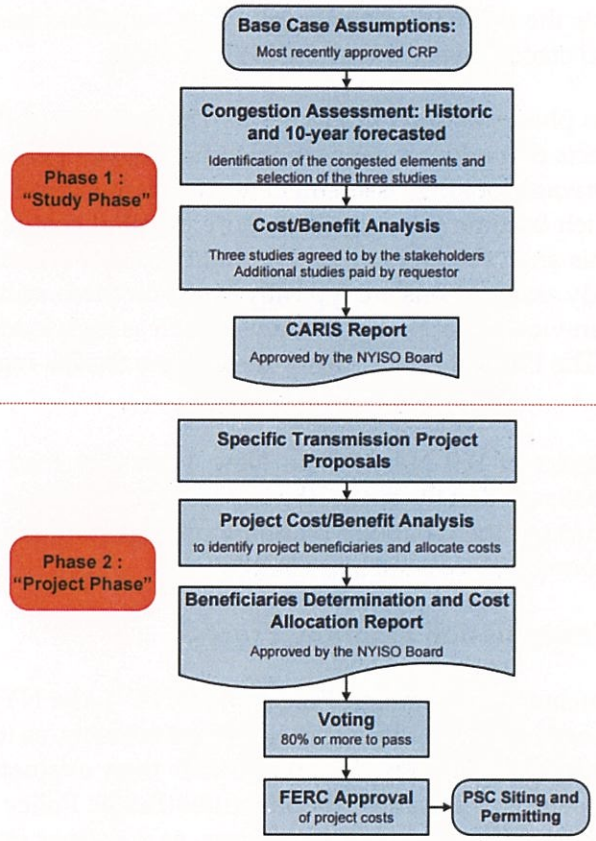
The request for solutions process leads to the development of the CRP, which provides documentation of the solutions. Note the CRP does not actually select from the proposed market-based solutions, but only states whether they are sufficient and timely to meet the identified needs. In the event that market-based solutions do not materialize, NYISO will indicate in the CRP the need to trigger a regulated solution which would be eligible for cost allocation and recovery under the NYISO's tariff. In addition, the NYISO and its Independent Market Advisor investigate whether market rules changes are necessary to address a possible failure in one of the NYISO's competitive markets.

LEI believes that Bill No. 1745 in New York City would have a significant impact on the RPP process. For instance, a higher forecast peak load in NYC due to anticipated building electrification may to lead to resource adequacy needs identified by the RNA in Zone J, which will lead to a request for and subsequent development of a significant number of market-based or regulated solutions. Note that NYISO's base case RNA forecast only assumes programs,

legislations and regulations which have been already been adopted; however NYISO also works with stakeholders to develop additional reliability scenarios.[26] For example in the 2018 RNA, NYISO considered high load and removal of capacity scenarios.[27]

4.3 Economic Planning Process

Figure 32. NYISO Congestion Assessment and Resource Integration Study



Source: NYISO

The Congestion Assessment and Resource Integration Study ("CARIS") is the primary component of the Economic Planning Process. The CARIS is performed every two years, alternating with the RNA. The study analyzes congestion in the New York bulk power system and projects economic benefits associated with relieving that congestion, utilizing the finalized viability and sufficiency assessment from the CRP. Key objectives are to:

---

[26] Pursuant to Section 31.2.2.5 of Attachment Y to the NYISO Open Access Transmission Tariff.

[27] NYISO. 2018 RNA Report. <https://home.nyiso.com/wp-content/uploads/2016/10/2018-Reliability-Needs-Assessment.pdf>

1. project congestion on the New York State BPTFs over the ten-year CSPP planning horizon;
2. identify, through the development of appropriate scenarios, factors that might affect congestion;
3. provide information to Market Participants, stakeholders and other interested parties on solutions to reduce congestion and to create production cost savings which are measured in accordance with the Tariff requirements;
4. provide an opportunity for developers to propose solutions that may reduce the congestion; and
5. provide a process for the evaluation and approval of regulated economic transmission projects for regulated cost recovery under the NYISO Tariff.

The CARIS process has two phases as seen in Figure 32. The purpose of Phase 1 is to provide information regarding projects that address congestion costs to developers and the marketplace. The NYISO performs a forward-looking assessment to determine the three most congested elements or groupings, which become the subject of more detailed cost benefit analysis in the CARIS studies. Note that this analysis refers to generic solutions and therefore do not represent specific projects. CARIS study assumptions are typically based on those utilized in the Reliability Planning Process from the previous year; scenario analysis such as high load, or impact of carbon pricing is also undertaken. The Phase 2 process is for developers to seek regulated cost recovery for specific projects.

Although the estimated impact of Bill No. 1745 to New York City load is likely to increase congestion into Zone J, LEI believes that the size of the increased load from building electrification will have to be addressed through the reliability planning process summarized in Section 4.1, as opposed to an economic planning process such as CARIS.

4.4 Public Policy Transmission Planning Process

Under the Public Policy Transmission Planning Process ("PPTPP"), the NYISO solicits proposal solutions for transmission needs driven by Public Policy Requirements, as identified by the New York Public Service Commission ("NY PSC"). The NYISO then evaluates the viability and sufficiency of the proposed solutions to satisfy the identified Public Policy Transmission Need. The NYPSC holds considerable influence over this process, as it defines evaluation criteria and reviews the assessment of the NYISO. The Public Policy planning process could be an alternative to the RPP, should the NY PSC feel that it could better control the additional infrastructure built to address the rising load in NYC by identifying a need for specific types of transmission projects.

Recent public policy transmission proceedings have been undertaken by the NY PSC when it felt that the CARIS process did not sufficiently consider all the benefit categories of transmission infrastructure in the state.

Recent NY PSC Public Policy Projects

Western NY Transmission: In July 2015, the NY PSC adopted a public policy requirement related to the potential need for additional transmission capability in western New York. The NY PSC identified significant environmental, economic, and reliability benefits that could be achieved by relieving the transmission congestion identified in the western New York region. As a result, on November 1, 2015, the NYISO issued a solicitation for projects designed to address the need identified by the NY PSC. In October 2017, NYISO selected a project from NextEra Energy Transmission New York as being both the more efficient and cost-effective project based on its overall performance.

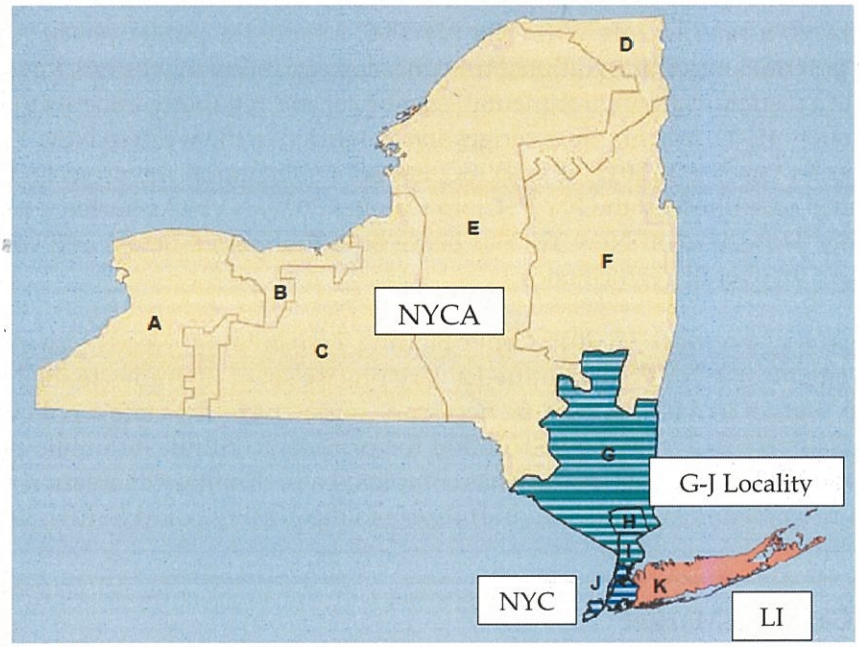
AC Upgrades: In its December 17, 2015 Order Finding Transmission Needs Driven by Public Policy Requirements, the NY PSC identified a very precise set of upgrades to the NYCA bulk power system that, in its view, would be necessary pursuant to the state's policy goals. On February 29, 2016, NYISO issued a solicitation for projects to fulfill the public policy need identified by the NY PSC's Order. NYISO has completed a preliminary evaluation of 13 viable and sufficient projects and submitted a draft report to the NYISO board in July 2018.

4.5 NYISO Capacity Market

As discussed in the previous section, new resources such as generation resources, interruptible load, storage resources, or transmission infrastructure would need to come online in order to meet the increased peak demand in NYC. When foreseeing such a need, the NYISO believes that market-based solutions should be the preferred choice to meet reliability needs. Market-based resources in the NYISO power markets can make revenue through energy markets, ancillary services (regulation and operating reserve), as well as the capacity market. Generation, demand response, and certain types of transmission are paid for capacity. It was introduced by the NYISO in 1999 to fill a perceived gap in the 'reliable' operations of the wholesale electricity market. Through the capacity market, the NYISO ensures resource adequacy by providing a market signal to incentivize investment in market-based solutions.

The capacity market is locational, including the New York City, Long Island, G-J Locality, and NYCA zones as shown in Figure 33. Due to this locational nature, the capacity market facilitates investment in the localities in which it is needed. Localities are nested within one another (NYC is within the G-J locality) and within NYCA (both G-J and Long Island are in NYCA).

Figure 33. NYISO capacity zones



Source: NYISO

In order to maintain resource adequacy, LSEs are required to procure sufficient capacity such that they meet a reserve margin above their projected peak demand, known as the Installed Reserve Margin ("IRM"). IRM is established annually by the New York State Reliability Council, according to the reliability criteria of a Loss of Load Expectation of no greater than 0.1 days per year.[28] In 2018, the IRM was set at 18.2%. LSE's may also have Locational Capacity Requirements ("LCR") if they are located in New York City, Long Island, or G-J Locality. These are designed to ensure that LSE's do not rely too much on imports to meet their resource adequacy requirements. As such, LSEs within localities need not only procure sufficient capacity to meet their LCR from within their own locality, but also sufficient NYCA capacity to meet the overall statewide IRM.

Figure 34. Capacity market locality parameters (2018-2019)

Capacity Region	Requirement (%)	Demand Curve Length (%)
NYCA	118.2%	112%
G-J Locality	94.5%	115%
NYC	80.5%	118%
LI	103.5%	118%

[28] http://www.nysrc.org/pdf/Reports/2018%20IRM%20Study%20Report%20Final%2012-8-17[2098].pdf

The NYISO conducts three types of centralized capacity auctions: a strip or capability period auction,[29] in which UCAP may be sold or purchased for six-month periods, a forward monthly auction, and a monthly spot auction. In addition to the auction process, capacity may also be traded bilaterally.

While the strip and monthly auctions clear at the intersection of supply offers and demand bids, the spot auction uses an administratively-set downward sloping demand curve to determine the capacity auction results.[30] The sloped demand curves value additional capacity above NYCA and locational minimum installed capacity requirements, and provide signals for capacity investments. Indeed, the demand curves are designed to make a new plant economic when it is needed – specifically, at 100% of the installed capacity requirement, the clearing price equals the reference point which is set so that over a capability year, a new generic peaking unit can earn its annualized net CONE.[31] NYISO's tariff requires an independent review of the demand curve parameters every four years,[32] in a process known as the Demand Curve Reset ("DCR"). The demand curves are based on levelized costs of peaking plants in the different capacity regions. In January 2017, FERC accepted the annual update methodology and inputs for capability years 2018/19 through 2020/21.[33]

Several demand curve parameters will evolve throughout the forecast horizon, notably the reference price and installed capacity requirement.

The reference price is a function primarily of the gross CONE in each locality, which generally speaking increases with inflation over time, and the energy and ancillary services revenues for the generic plants, which change as a function of energy market conditions.

The installed capacity requirement (or locational capacity requirement for the localities) is a function of the peak load, average forced outage rate, together with transmission constraints that can prevent outside supply from reaching the import-constrained localities (thus driving the need to procure a certain amount of capacity located within the locality)

---

[29] NYISO capability periods include summer (May through October) and winter (November through April)

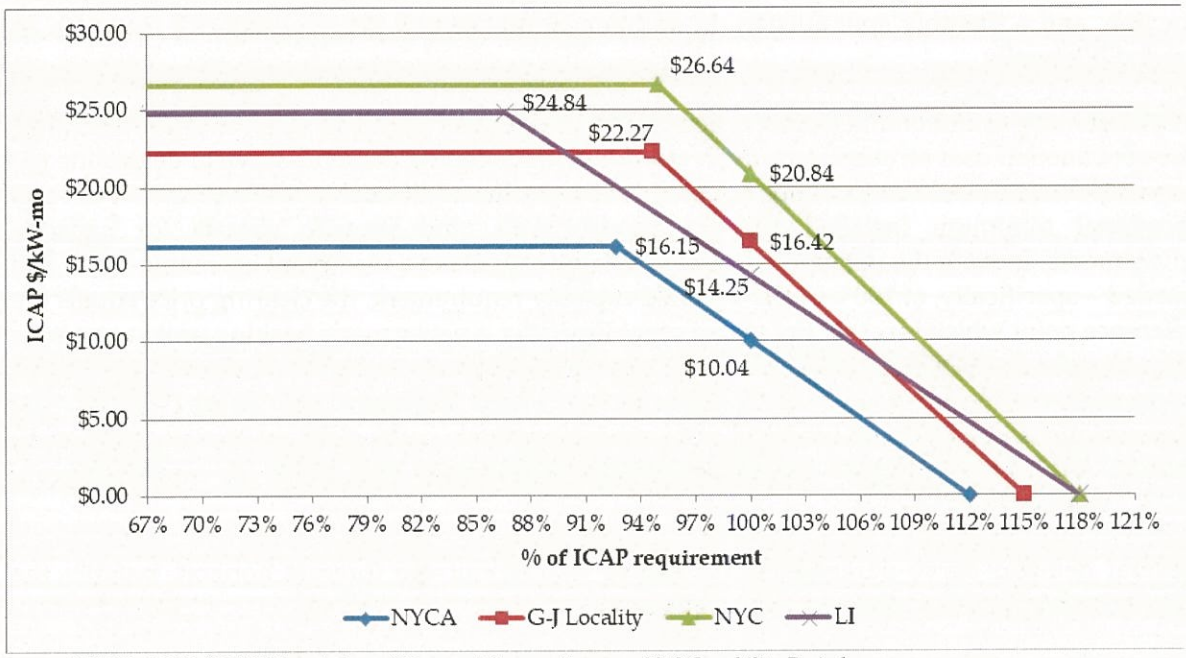
[30] See Section 5.15.2 of the NYISO Installed Capacity Manual, pg 5-15.

[31] Net CONE represents the annualized cost of constructing and operating a plant, minus expected annual energy and ancillary service revenues.

[32] Demand curves are adjusted every year based on average prices in the energy and ancillary services markets in previous years, but the cost component for the generic generation resources are recalculated every four years.

[33] FERC. Order Accepting Tariff Filing Subject to Condition. Docket ER17-386-000. January 17, 2017.

Figure 35. 2018-2019 ICAP spot auction demand curves



Source: NYISO, ICAP/UCAP Translation of Demand Curve – Summer 2018 Capability Period.

Suppliers sell unforced capacity ("UCAP"), which considers capacity resources' maximum capability in addition to historical operating performance to determine how much the supplier is qualified to offer. Any resource that is able to meet the minimum Dependable Maximum Net Capability ("DMNC") of 1 MW and maintenance schedule reporting requirements may qualify as an ICAP resource, though some individual resource types (such as external resources or Special Case Resources, which is NYISO's official name for capacity-qualified demand response) may have to meet additional requirements.[34] Participation in the capacity market, however, is optional for all suppliers. A supplier can choose to not participate at all, sell their capacity elsewhere, or sell their capacity in the bilateral market in NY.

As mentioned in Section 4.2, the NYISO's preference is always to have market-based solutions come online to satisfy the system's reliability requirements. Price signals from the capacity market are thus designed to encourage new resources to come online to ensure adequacy of resources in the state. The proposed Bill No. 1745 is expected to cause a significant increase in peak electricity demand due to the electrification of buildings in NYC. This will increase the ICAP requirement and the demand for capacity, therefore increasing capacity prices and the total costs of the wholesale capacity market – not only for NYC consumers, but for other consumers in New York State as well. Higher capacity prices provide the economic incentive for new market-based resources to come online, particularly in the New York City locality.

[34] NYISO Installed Capacity Manual, p. 4-1.

5 Building electrification impact on capacity and transmission costs for NYC consumers

Building electrification in NYC as a result of Intro 1745, if adopted as proposed, can result in increased costs for electricity consumers.

One reason for such an increase is the need for additional generation infrastructure (or equivalent means of meeting resource adequacy requirements, such as interruptible load, storage resources, or transmission infrastructure) to meet increased peak electric demand in NYC, which will result in higher capacity market prices so as to incentivize the construction of these new resources. Secondly, the increased electricity demand during winter months as a result of the heating load will increase the price in NYISO's energy market for this period, although the effect could be offset by the reduction in natural gas usage, and therefore lower price of natural gas, which directly affects the city's gas-fired generation resources' short-run marginal costs.[35]

Finally, to accommodate a large increase in end-use electric demand, the transmission and distribution network in the City would also need to be upgraded and expanded to meet reliability. LEI extrapolated from a previous report on ConEd's infrastructure costs to estimate increased costs due to building electrification.

5.1 NYC peak load calculation

NYC and the state of New York are currently summer-peaking regions, with winter load approximately 35%, or 4,000 MW, lower than summer load. However, the additional load from building electrification during the winter, mostly driven by heating requirements (space and water heating), would eventually turn NYC into a winter-peaking region.

The legislation, if adopted as proposed, would come into effect January 1, 2030 for buildings which do not have any rent-regulated units, and January 1, 2035 for those that do. The term rent-regulated encompasses both buildings that include rent-controlled as well as rent-stabilized apartments. While just about one percent of the total housing stock in New York City is rent-controlled, roughly 50 percent of the City's units are stabilized.[36]

This means that the additional load from electrification of commercial buildings would gradually increase NYC's peak load in the years leading to 2030,[37] while approximately half the additional residential load would appear in the years leading to 2030 and the other half in years leading to

---

[35] LEI did not analyze the impact of building electrification on NYISO energy market prices, as a full production cost modeling simulation was beyond the scope of this project.

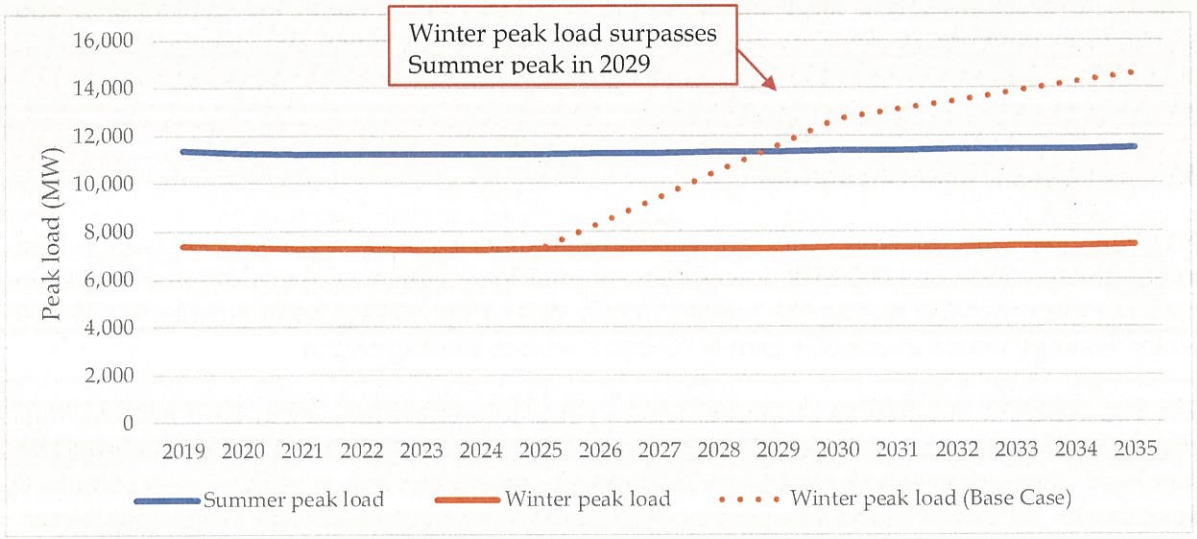
[36] "New York apartment guide: rent control vs. rent stabilization". August 28, 2017. Web. <https://ny.curbed.com/2017/8/28/16214506/nyc-apartments-housing-rent-control>

[37] LEI assumed that commercial buildings would electrify gradually over a period of five years leading to 2030

2035. LEI assumed a gradual increase in load over five years preceding effective dates for the fossil fuel usage limits.

Figure 36 illustrates the gradual increase in winter peak load for NYC based on the Base Case building electrification scenario, with respect to current summer and winter NYC peak load forecast absent building electrification as a result of Intro 1745. Using the current forecast peak load for the city, the additional load from electrification of commercial and a portion of residential buildings results in winter peak load slightly surpassing summer peak load in 2029, while the additional load from electrification of rent-regulated residential buildings increases NYC's winter peak load further until 2035. In this scenario, NYC's 2035 winter peak load is approximately twice the forecast winter peak load absent building electrification, and 30% or 3,150 MW higher than the summer peak load.

Figure 36. NYC summer and winter peak load with effect from Base Case building electrification



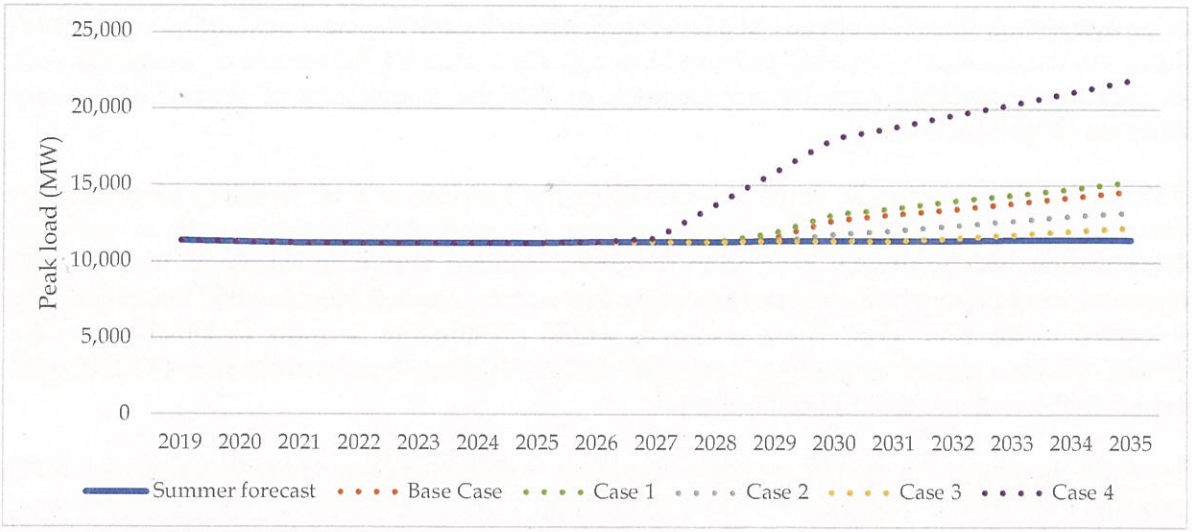
Source: NYISO 2018 Load and Capacity Data report; LEI

For purposes of NYISO's capacity market, the amount of installed capacity that must be procured is based on each region's forecast peak load during each twelve-month capability period.[38] As such, based on the current forecast of summer and winter peak load in NYC together with added impact from building electrification for the Base Case and all sensitivity cases, Figure 37 illustrates the resulting NYC peak load outlook for installed capacity procurement purposes.

The solid blue line represents the current NYC peak load forecast, based on summer peak load, absent any additional building electrification as a result of Intro 1745, which we can consider a "baseline". Under the various building electrification scenarios, the annual peak load starts diverging from the baseline in the 2027-2029, increasing until 2035.

[38] NYISO capability periods range from May through March of each year

Figure 37. NYC annual peak load following building electrification



Source: NYISO 2018 Load and Capacity Data report; LEI

5.2 NYISO market response to increasing peak load

In order to estimate costs, LEI replicated the processes embedded in the NYISO capacity market to determine the impact of increased NYC peak demand following building electrification, given the forecast of supply resources and demand curve parameters. As such, LEI prepared an outlook of capacity market drivers until 2035 under the baseline conditions, as well as for the various building electrification scenarios. See Appendix B for details of LEI's capacity market modeling assumptions and methodology.

NYISO's locational capacity market mandates that a certain proportion of NYC's installed capacity requirement (peak load plus reserve margin) be met by through resources electrically located in-city.[39] The remainder of capacity can be procured from resources located in the G-J capacity locality and elsewhere in the state, taking advantage of available transmission capacity from other parts of the state and adjoining areas.

As the peak load and installed capacity requirement increase in NYC, the design of the sloped demand curves causes the offer curve (offers from generators, controllable lines, and interruptible load) to intersect with the demand curve at a higher point, resulting in higher prices for capacity. Eventually as load continues to increase, the price for capacity reaches a level sufficient to incentivize the construction of new supply resources; at that point, the average annual capacity price in New York City would be equivalent to the net CONE of a generic peaking plant.

[39] Currently, NYISO's LCR is 80.5% of the city's peak load

Once the equilibrium (i.e. installed capacity equal to the locational capacity requirement) is reached, the price for capacity in NYC would not necessarily increase significantly even as load keeps increasing, since it is already at a level sufficient to incentivize new generation resources.[40] However, the amount of capacity procured through the auctions will increase concurrently with the increase in installed capacity requirement, so that the overall cost of procuring capacity increases as load increases.

LEI's approach of using the same net CONE in the baseline and all building electrification scenarios is conservative, as the large quantity of peak load increase due to building electrification, and additional generation resources required within an extremely limited NYC footprint, would likely create the need to bring in resources located outside NYC but electrically connected to the NYC grid. These resources would presumably be more expensive than the current cost for a generic resource (in constant dollars), leading to an increase in net CONE with respect to the level assumed in LEI's analysis.

Figure 38 illustrates the overall capacity costs, and resulting average capacity prices, for NYC consumers for 2030 and 2035, given the baseline supply/demand parameters and capacity price forecast as detailed in Appendix B. The figure also illustrates the overall cost of capacity, and capacity prices, for NYC consumers under the various scenarios related to building electrification. Total capacity costs, and average prices, include the sum of costs for NYC customers to purchase in-city capacity to meet the NYC LCR, together with additional capacity purchased in the G-J locality to meet the G-J LCR and additional capacity purchased in the NYCA zone to meet the overall statewide installed capacity requirement.

Figure 38. NYC capacity costs under various scenarios

		Baseline	Building electrification scenarios				
			Base Case	Case 1	Case 2	Case 3	Case 4
2030	Total capacity cost [$ billion]	$1.39	$2.33	$2.43	$2.13	$1.39	$3.57
	Peak load [MW]	11,346	12,666	13,084	11,800	11,346	18,028
	Capacity price [$/kW-yr]	$122.4	$183.9	$185.4	$180.5	$122.4	$198.2
	Increase from baseline		*50.2%*	*51.5%*	*47.5%*	*0.0%*	*61.9%*
2035	Total capacity cost [$ billion]	$1.62	$3.12	$3.27	$2.78	$2.51	$4.99
	Peak load [MW]	11,458	14,606	15,190	13,266	12,222	21,816
	Capacity price [$/kW-yr]	$141.4	$213.7	$215.4	$209.4	$205.4	$228.9
	Increase from baseline		*51.1%*	*52.3%*	*48.1%*	*45.2%*	*61.9%*

Under baseline conditions, i.e. without additional load from building electrification as a result of Intro 1745, the total cost of purchasing capacity in NYC would be $1.39 billion in 2030, and $1.62 billion in 2035 (nominal dollars). Assuming that Intro 1745 is adopted as-is, the annual capacity costs for NYC consumers would increase to $2.33 billion, resulting in a price increase of 50% in

[40] The price might still increase modestly as NYC load must still purchase a portion of its capacity in the G-J locality and NYCA region, where an increase in load can still cause an increase in price for these zones.

2030 for the Base Case scenario, and range from no change to as high as $3.57 billion (62% price increase) in the various sensitivity analyses. The relatively small difference in rate increase between the sensitivity scenarios is due to the fact that the NYC capacity price reaches the net CONE level, incentivizing the construction of new resources to maintain the resource adequacy reliability standard.

Similarly in 2035, once all buildings above 25,000 square feet are subject to the fossil fuel use limitations, the additional load would result in a total capacity cost for NYC customers of $3.12 billion (price increase of 51%) for the Base Case scenario, and range from $2.51 billion (45% price increase) to $4.99 billion (62% price increase) in the various sensitivity analyses.

As mentioned previously, LEI used a conservative assumption that the net CONE for new capacity resource would be similar in the building electrification scenarios as it is in the baseline forecast. However, an increase in the net CONE due to the large amount of new capacity required would directly translate into an additional increase in capacity prices. For instance, if the large amount of required new resources in the building electrification scenarios results in a net CONE value which is 10% higher than in the baseline, this would result in a larger price increase – for instance, for the Base Case scenario in 2035, the capacity price increase would change from 51% to 64% with a 10% higher net CONE.

The impact of increased load due to building electrification on capacity prices, with respect to baseline capacity prices, will not persist indefinitely. Indeed, in the baseline scenario, the equilibrium between installed capacity and locational capacity requirement in NYC would be reached around 2041, at which point the baseline capacity price would be equal to the net CONE and capacity rates in the baseline forecast be roughly equivalent to rates in the building electrification scenarios. Any increase in the net CONE caused by building electrification, however, would result in persistently higher prices in the building electrification scenarios with respect to baseline rates.

In all cases, the total cost for capacity in NYC (in dollar amount) persistently remains much higher in the building electrification scenarios than in the baseline forecast, due to the higher installed capacity requirement.

5.3 Potential transmission and distribution expansion costs in NYC

To estimate the impact of building electrification on transmission and distribution costs in NYC, LEI used findings from ConEd's 20-year Integrated Long Range Plan ("ILRP") from 2011 to 2031.[41] The ILRP studies potential infrastructure needs and costs over the 20-year planning horizon as a result of customer demand trends for electricity.

In the study, ConEd had forecast a peak demand of 13,100 MW in 2011 and a peak demand of 16,425 MW in 2031. This represents an increase of 3,325 MW or approximately 25% additional

[41] ConEd's most recent 20-yr comprehensive planning report is from April 2012, through the Integrated Long-Range Plan. ConEd also produces annual 10-year Long-Range Transmission Plans but these reports do not include indicative infrastructure costs. As a result, LEI used the results from the Integrated Long-Range Plan.

demand. ConEd estimated that this increase in demand would require 6 new substations at the transmission or sub-transmission level to accommodate 6 new distribution networks in their service area. In addition to the substations, ConEd would need to implement associated equipment and cable transfers and expansions in local areas of the distribution system.[42]

Impact of DERs

With the State's REV initiative and aggressive clean energy goals, the integration of DERs and non-wires solutions ("NWS") will continue to expand. In ConEd's Distributed System Implementation Plan ("DSIP"), ConEd states that they expect solar installations to reach 600 MW and CHP installations to reach 260 MW by the end of 2023. In addition, ConEd expects a large growth in energy storage technologies and up to 800 MW in peak demand savings from Demand-Side Management ("DSM") programs. This translates to over 1,700 MW in load offset from DERs by 2023.[1]

It is inevitable that DERs will continue to offset the City's load as the grid becomes modernized. As a result, DERs will help mitigate some of the transmission and distribution costs that will be required as a result of building electrification.

ConEd estimated that the total infrastructure cost over the 20-year planning horizon would be approximately $23.8 billion (in 2011 dollars) or $26.7 billion in 2018 dollars.[43] Of this, approximately 44% would be proportioned towards system expansion, 31% towards reliability, 16% towards T&D replacement, and 9% for other costs.[44]

Therefore, system expansion costs equate to $10.5 billion to service the additional 25% or 3,325 MW in increased peak demand. Based on this estimate, LEI calculated an indicative approximation that a 1 MW peak demand increase translates to $3.5 million in T&D costs. LEI then applied this value to the incremental NYC peak load from each sensitivity case, to determine the estimated T&D costs as a result of building electrification by 2035. Results are shown in Figure 39.

---

[42] ConEd's Integrated Long Range Plan is based off of ConEd's Electric Long Range Plan which was released 4 months prior. Source: Consolidated Edison. "Electric Long-Range Plan". December 2011.

[43] LEI used an inflation rate of 12.03% to convert 2011$ to 2018$. Source: < https://www.officialdata.org/2011-dollars-in-2018?amount=100>

[44] ConEd was estimating infrastructure costs at approximately $1.3 billion per year in its Long Range Plan. To put this into today's context, electric infrastructure investment has risen to $1.9 billion in 2017 and is estimated to be $1.93 billion for 2018-year end. Source: Consolidated Edison. "Con Edison Annual Report 2017". 2017.

Figure 39. Estimated transmission and distribution costs in NYC due to building electrification

	Incremental Peak Load (MW)	Total T&D costs ($ billion)	Annual T&D costs ($ billion)
Base Case	3,148	$11.11	$1.44
Case 1	3,732	$13.17	$1.71
Case 2	1,808	$6.38	$0.83
Case 3	764	$2.70	$0.35
Case 4	10,358	$36.55	$4.75

Note: LEI annualized the T&D investment costs using a generic 13% factor, which is meant to cover financing costs as well as O&M costs for the transmission investment

As depicted in the above figure, T&D costs range from $2.70 billion in Case 3 to as much as $36.55 billion in sensitivity Case 4. ConEd would spread out the investment over a period of years prior to 2035, so that the T&D system is ready by the time the full additional load from building electrification is realized. Using a generic annualization factor to convert the investment cost into annual revenue requirement for ConEd, LEI estimated that annual costs for NYC consumers from 2035 onward could range from $0.35 billion to $4.75 billion.

While the above calculation of potential T&D costs is a very high-level approximation, it is still apparent that T&D upgrade costs in NYC necessary to accommodate an increase in peak load following building electrification, should Intro 1745 be adopted as proposed, are significant and could potentially be higher than the cost related to additional generation infrastructure.

6 Building electrification impact on Clean Energy Standard

Electrification of NYC buildings will have consequences for New York's Clean Energy Standard ("CES") targets and overall carbon content of the New York system. The 2015 New York State Energy Plan introduced the state's strategy to "build a clean, resilient, and affordable energy system for all New Yorkers."[45] Among other objectives, the plan aims to put the state on a path to achieving the following clean energy goals by 2030: [46]

- 40% reduction in Greenhouse Gas ("GHG") emissions from 1990 levels; and
- 50% of electricity generated from carbon-free renewable energy sources such as solar, wind, hydropower and biomass ("50 by 30 goal").

On August 1st, 2016, the NY PSC published the "Order Adopting a Clean Energy Standard".[47] In its order, the NY PSC adopted the 50 by 30 and GHG reduction clean energy goals as stated in the State Energy Plan.

New York's Clean Energy Standard

In addition to adopting the 50 by 30 goal, the CES also featured:

- obligations on LSEs to financially support new renewable generation resources;
- a requirement for regular REC procurement solicitations;
- obligations on distribution utilities to financially support the maintenance of certain existing at-risk small hydro, wind and biomass generation attributes;
- a program to maximize the value of potential of new offshore wind resources; and
- obligations on LSEs to preserve existing nuclear zero-emissions attributes through the purchase of Zero-Emission Credits ("ZEC").

LEI's analysis shows that additional electric load in NYC resulting from building electrification could range from 4.2 TWh to approximately 13.4 TWh annually by the time the proposed limits are enforced (2030 to 2035). Assuming the 50 by 30 goals are extended, this would result in an additional 2.1 TWh to 6.7 TWh of renewable energy required. If however the increased load from building electrification is realized faster than the additional renewable energy can come online, this could result in a temporary uptick in carbon emissions in NYC.

---

[45] 2015 New York State Energy Plan. Web. <http://energyplan.ny.gov/Plans/2015>

[46] 2015 New York State Energy Plan Frequently Asked Questions. Web. <http://energyplan.ny.gov/-/media/nysenergyplan/2015-faqs.pdf>

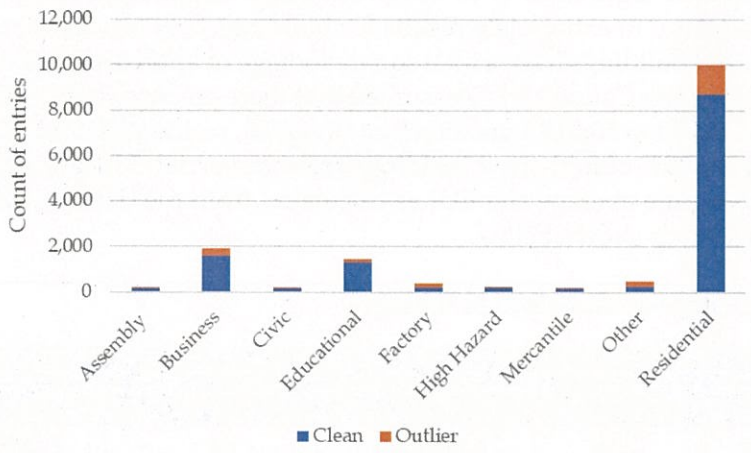
[47] NY PSC. Order Adopting a Clean Energy Standard. Case 15-E-0302. August 1, 2016.

7 Appendix A: Detailed methodology for estimating building energy usage

7.1 Data cleaning methodology

LEI's review of the LL84 data revealed that the dataset contained erroneous entries that required cleaning. LEI focused on cleaning outlier entries which were at the extreme ends of weather normalized, source EUI. LEI took the natural logarithm of the weather normalized, source EUI in order to make the distribution symmetrical, then identified outliers as entries as that were greater or less than two standard deviations from the mean.[48] In order to maintain the largest possible dataset, LEI did not remove outlier entries but rather replaced them with entries corresponding to the average EUI by building type. Similarly, entries that were missing borough, block and lot numbers were not removed as LEI's analysis did not require this data. From a total of 15,112 entries, LEI cleaned a total of 2,202 outliers.

Figure 40. Number of outliers by building type



The outlier entries were reviewed in order to determine their possible impact on results – the results can be seen in the figure below. Residential building outliers made up 1,287 of the 2,202 outliers cleaned, which was the largest group. The clean data for a residential buildings has a site EUI of ~86 kBtu/sq ft, which is realistic. Analysis showed residential outliers have a site EUI of 1,390 kBtu/sq ft, which is not realistic and therefore would have skewed the results of the analysis.

[48] A similar methodology was utilized by the Urban Green Council in their latest report using the LL84 data. (Urban Green Council. *New York City's Energy and Water Use 2014 and 2015 Report.* October 2017)

Figure 41. Outlier EUI compared to clean data

Avg. Site EUI	Clean	Outlier
Assembly	129.1	3.3
Business	91.0	1,463.9
Civic	94.3	0.0
Educational	71.7	20.1
Factory	75.0	245.1
High Hazard	172.6	79.9
Mercantile	113.1	28.7
Other	83.8	485.5
Residential	85.9	1,390.2

7.2 Estimation of mid-sized buildings

The 2016 Energy and Water Data Disclosure contained mainly large buildings over 50,000 square feet. Since the proposed legislation is to cover buildings larger than 25,000 square feet, LEI developed a methodology to extrapolate results for buildings between 25,000 and 50,000 square feet. [49] These mid-sized buildings have a total square footage of approximately 342 million square feet as per the Urban Green Council.[50] LEI assumed that there are three major building types with a square footage of 25,000 to 50,000 square feet: commercial, residential, and other or mixed-use. Of these, LEI assumed 39% of mid-sized buildings are commercial, 38% are residential, and 23% are mixed-use.[51] Using the average site EUI as calculated from the dataset, LEI determined the total energy use in kBtu as shown below.

Figure 42. Square footage of mid-sized buildings

Building Type	Building Breakdown	Square Feet	Average Site EUI (kBtu/sq.ft.)	Total Energy (kBtu)
Mixed Use	23%	78,660,000	84	6,593,380,277
Commercial	39%	133,380,000	91	12,143,249,491
Residential	38%	129,960,000	86	11,157,096,437

LEI then used the percent of site energy consumption by building type and energy type to determine the breakdown of total energy use into each energy type.

---

[49] Note that in 2016, Local Laws 84 and 88 were expanded to include buildings larger than 25,000 square feet in benchmarking, however this data is not yet available in current LL84 datasets. (Source: https://www.urbangreencouncil.org/content/news/greener-greater-mid-sized-buildings-nyc)

[50] Urban Green Council. *Greener, Greater Mid-Sized Buildings in NYC.* October 13, 2016 https://www.urbangreencouncil.org/content/news/greener-greater-mid-sized-buildings-nyc

[51] New York City. *A Stronger, More Resilient New York.* June 11, 2013. < https://www1.nyc.gov/assets/sirr/downloads/pdf/Ch4_Buildings_FINAL_singles.pdf>

Figure 43. Energy breakdown of mid-sized buildings

	Electricity	District Steam	Natural Gas	FO #2	FO # 4	FO #5&6	Total Energy (kBtu)
Mixed Use	2,967,021,125	329,669,014	2,109,881,689	527,470,422	527,470,422	131,867,606	6,593,380,277
Commercial	7,285,949,695	607,162,475	3,885,839,837	242,864,990	60,716,247	60,716,247	12,143,249,491
Residential	2,789,274,109	557,854,822	5,801,690,147	892,567,715	892,567,715	223,141,929	11,157,096,437

Using these assumptions, LEI's model projects an increase in NYC annual load of 554 GWh for buildings between 25,000 and 50,000 square feet, compared to the Base Case.

8 Appendix B: LEI's NYISO capacity market modeling methodology

LEI replicates the processes embedded in the NYISO market for determining the equilibrium capacity price, given the supply of capacity in New York State and a downward sloping demand curve.

Overall capacity supply offers are matched with an administratively determined downward sloping demand curve. Capacity prices are determined by the intersection of the offer and demand curves.

LEI relies on the zonal peak load forecast by the NYISO and its own outlook on other parameters such as the IRM and LCR to determine the annual Installed Capacity ("ICAP") requirement. LEI further uses the annual forced outage rates from its generator database to forecast an Estimated Forced Outage Rate on demand ("EFORd") which is used to determine the Unforced Capacity ("UCAP") requirement.

8.1 Supply

Existing supply in New York is based on the 2018 Load & Capacity Data Report ("Gold Book") published by the NYISO,[52] which provides the recent rated capacity for both summer and winter seasons as of April 2018, and is supplemented with plant parameters (such as forced outage rate) from a commercial database.

Going forward, for short-term new entry, LEI reviewed the NYISO interconnection queue to incorporate known projects that are relatively certain to reach completion and commercial operation. Furthermore, renewable new entry is introduced throughout the modeling horizon to align with the state's recently adopted CES, as discussed in Section 8.1.1.

Over the long term, LEI assumes that generators make "just-in-time" capacity investment decisions. New combined cycle or simple cycle natural gas entry is based on economic analysis as described in Section 8.1.2.

8.1.1 Renewable generation

The REC procurement as outlined in the CES is agnostic on the nature of new renewable supply (i.e. there is no carve-out for specific technologies), as long as they meet the requirements of Tier 1 resources.[53] The economics of new technologies, as well as possible preference by some LSEs for deliverability of some amounts of energy to their respective service territories,[54] are going to drive development of new renewable resources. As such, among the various resources listed in

---

[52] NYISO. 2017 Load & Capacity Data. April 2017.

[53] Generally speaking, eligible technologies include small hydro, biogas/biomass, solar, and wind. The full eligibility requirements can be found in Appendix A to the NY PSC Clean Energy Standard order.

[54] As evidenced in the recent NYPA RFP for 1 TWh of renewable energy, which indicated a preference for delivery of energy into zone J.

contact:
Gabriel Roumy/Ian Chow
617-933-7225
gabriel@londoneconomics.com

the CES as eligible for Tier 1, the most likely source for the majority of the new renewable energy are wind and solar resources. Using several sources of information such as targets for NYSERDA programs,[55] or analysis by DPS Staff,[56] LEI created an estimate of the amount of new resources, by technology, which would come online in order to meet the 50 by 30 goal.

As shown in Figure 44, only a small proportion of incremental renewable installed capacity is assumed to be sited in NYC and would therefore have a limited impact on the NYC capacity price over time. For refence purposes, NYC represents approximately 35% of the State's load while only 5% of renewable generation capacity is projected to be located in the City.

Figure 44. Incremental renewable installed capacity by region by 2030

Incremental Capacity (MW) by 2030	West NY	Capital	LHV	NYC	LI
Land-based wind	4,000	2,000	0	0	0
Offshore wind	0	0	0	500	500
Utility-scale solar	2,593	2,201	504	0	427
BTM Solar	862	384	608	292	492
Hydro	285	177	37	0	0
Biomass/ADG	200	0	0	0	0
Total	**7,940**	**4,762**	**1,149**	**792**	**1,419**

8.1.2 New entry

Apart from policy-driven entry of new renewable generation, new entry decisions are conditioned on modeled outcomes such that additional new entry is introduced if and when it is economically feasible given the simulated market dynamics. Notably, new entry in LEI's baseline (i.e. before any increase in peak load resulting from building electrification) capacity forecast, in addition to policy-driven new renewable resources, include both announced economically-driven thermal new entry by 2035 in the NYCA in order to meet resource adequacy reliability requirements.

8.1.3 Retirements

LEI models retirements when they have been announced by the owner, or if their revenues cannot cover the minimum going forward fixed costs three years in a row, consistent with economically rational business behavior. LEI also studies recent retirements trends and assumes retirement of old generators with a very low capacity factor at a rate conservatively based on the recent trend.

---

[55] These include the Clean Energy Fund, NY-Sun, offshore wind procurement targets, and other programs developed as part of the Reforming the Energy Vision ("REV") proceeding.

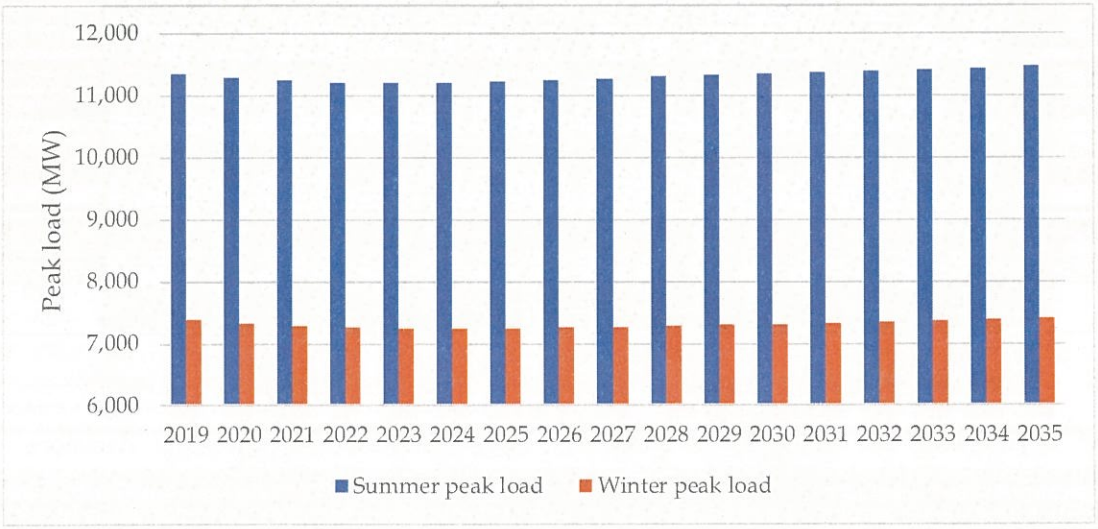
[56] NY DPS. Final Supplemental Environment Impact Statement. Case 15-E-0302. May 19, 2016.

Notably, LEI assumes approximately 100 MW of installed capacity retires annually on average in New York City.

8.2 Demand

LEI relies on the NYISO 2018 Gold Book ten-year forecast for the annual zonal peak load forecast in the state. NYISO's forecast includes a baseline econometric forecast, which is then modified to account for Energy Efficiency efforts and Behind-the-Meter ("BTM") generation (both conventional and renewable). Figure 45 illustrates the Gold Book 2019-2035 NYC peak load forecast for the summer and winter seasons.

Figure 45. Forecast peak demand in NYC



Source: NYISO 2018 Gold Book

Over the forecast horizon, NYC summer peak load averages approximately 11,250 MW, while the winter peak load is approximately 35% lower, averaging 7,270 MW. In both cases, peak load decreases for the first five years as a result of energy efficiency and BTM resource incentives, before increasing again and ending up in 2035 at levels only slightly higher than the 2019 levels.

8.3 Capacity market demand curve

LEI calculated the change in demand curve market parameters (including reference price, IRM, LCR, and EFORd) until 2035, so as to be in a position to prepare the baseline estimates for 2030 and 2030 which are used in Section 5.2 of this document.

Figure 46. Demand curve parameters, current values and forecast for 2030 and 2035

	NYCA			G-J Locality			NYC		
	2018	2030	2035	2018	2030	2035	2018	2030	2035
net CONE	100.19	127.0651	140.2902	148.67	188.5495	208.1739	168.6767	213.9229	236.1882
IRM/LCR	118.20%	138.80%	138.80%	94.50%	85.84%	85.84%	80.50%	81.33%	81.33%
EFORd	8.56%	21.64%	21.64%	6.26%	10.22%	10.22%	7.09%	6.75%	6.75%
Demand curve length	112%	112%	112%	115%	115%	115%	118%	118%	118%

Figure 46 illustrates the 2030 and 2035 net CONE, IRM/LCR, EFORd, and demand curve length parameters which together define the spot auction demand curves, as compared to the current values.

The net CONE values for all three relevant capacity zones increase over time as a function of the increase in gross CONE (based on inflation) together with the change in energy and ancillary services revenues, which partially offset the gross CONE.

The IRM (for NYCA) and LCRs (for G-J and NYC) evolve differently from one another. The NYCA IRM is forecast to increase from approximately 118% currently to almost 139% in 2030 and beyond, mainly because of the increased penetration of intermittent renewable energy resources over time and need for reserve capacity to balance their output. The G-J locality LCR decreases in the early 2020s following the completion of policy-driven AC transmission upgrades, before increasing again following addition of intermittent generation in the locality. The G-J LCR for 2030 and beyond is still lower than the current value. Finally, the NYC LCR is only slightly affected by the transmission upgrades and new renewable generation (mainly behind-the-meter) in the zone, and is slightly higher in 2030 and beyond than in 2018.

8.4 Impact of additional load

When considering the capacity market forecast in the NYCA, G-J, and NYC regions for the building electrification scenarios, there are some capacity market drivers that will not change but others will.

For instance, as mentioned in Section 5.2, LEI assumes that the net CONE for new generic resources in all three regions remains the same in the building electrification scenarios as for the baseline forecast. Similarly, the EFORd remains identical in the baseline as in the building electrification scenarios. While the NYCA IRM remains also identical as in the baseline, the increased peak load in the NYC (and G-J locality, since NYC is nested within G-J) for the building electrification scenarios lead to an increased LCR for those localities, considering that the transmission capacity into those localities from does not change – there is thus a need for additional capacity located within the zones to meet the increased load.

8.5 Baseline capacity market forecast

Based on the capacity market drivers discussed in the prior sections for the baseline forecast as well as building electrification scenarios, Figure 47 represents the NYCA, G-J locality, and NYC load and capacity forecast for 2030 and 2035.

Figure 47. Load and capacity forecast for baseline and building electrification scenarios

NYCA	2030						2035					
	Baseline	Base Case	Case 1	Case 2	Case 3	Case 4	Baseline	Base Case	Case 1	Case 2	Case 3	Case 4
net CONE [$/kW-yr]	$127.1	$127.1	$127.1	$127.1	$127.1	$127.1	$140.3	$140.3	$140.3	$140.3	$140.3	$140.3
EFORd	21.64%	21.64%	21.64%	21.64%	21.64%	21.64%	21.64%	21.64%	21.64%	21.64%	21.64%	21.64%
Peak load [MW]	32,598	33,918	34,336	33,052	32,598	39,280	32,873	36,021	36,605	34,681	33,637	43,231
IRM	138.8%	138.8%	138.8%	138.8%	138.8%	138.8%	138.8%	138.8%	138.8%	138.8%	138.8%	138.8%
UCAP requirement [MW]	35,455	36,890	37,345	35,948	35,455	42,722	35,754	39,178	39,813	37,720	36,585	47,020
UCAP available [MW]	38,863	39,584	39,974	38,776	38,863	44,584	38,575	41,000	41,545	39,750	38,777	47,723
% excess	9.6%	7.3%	7.0%	7.9%	9.6%	4.4%	7.9%	4.7%	4.3%	5.4%	6.0%	1.5%
Clearing price [$/kW-yr]	**$25.26**	**$49.75**	**$52.53**	**$43.77**	**$25.26**	**$80.92**	**$48.05**	**$85.91**	**$89.44**	**$77.37**	**$70.24**	**$122.79**

G-J	2030						2035					
	Baseline	Base Case	Case 1	Case 2	Case 3	Case 4	Baseline	Base Case	Case 1	Case 2	Case 3	Case 4
net CONE	$188.5	$188.5	$188.5	$188.5	$188.5	$188.5	$208.2	$208.2	$208.2	$208.2	$208.2	$208.2
EFORd	10.22%	10.22%	10.22%	10.22%	10.22%	10.22%	10.22%	10.22%	10.22%	10.22%	10.22%	10.22%
Peak load	15,600	16,920	17,338	16,054	15,600	22,282	15,744	18,892	19,476	17,552	16,508	26,102
LCR	85.8%	86.9%	87.3%	86.2%	85.8%	90.1%	85.8%	88.2%	88.6%	87.3%	86.5%	91.5%
UCAP requirement	12,023	13,208	13,583	12,430	12,023	18,022	12,134	14,960	15,485	13,757	12,820	21,433
UCAP available	13,601	14,321	14,711	13,513	13,601	19,321	13,727	16,152	16,697	14,902	13,929	22,875
% excess	13.1%	8.4%	8.3%	8.7%	13.1%	7.2%	13.1%	8.0%	7.8%	8.3%	8.7%	6.7%
Clearing price	**$25.26**	**$82.59**	**$84.18**	**$79.00**	**$25.26**	**$97.92**	**$48.05**	**$97.62**	**$99.54**	**$92.64**	**$88.11**	**$122.79**

NYC	2030						2035					
	Baseline	Base Case	Case 1	Case 2	Case 3	Case 4	Baseline	Base Case	Case 1	Case 2	Case 3	Case 4
net CONE	$213.9	$213.9	$213.9	$213.9	$213.9	$213.9	$236.2	$236.2	$236.2	$236.2	$236.2	$236.2
EFORd	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%	6.75%
Peak load	11,346	12,666	13,084	11,800	11,346	18,028	11,458	14,606	15,190	13,266	12,222	21,816
LCR	81.3%	83.3%	83.8%	82.0%	81.3%	88.2%	81.3%	85.4%	85.9%	83.9%	82.5%	90.2%
UCAP requirement	8,605	9,835	10,225	9,027	8,605	14,835	8,690	11,625	12,170	10,375	9,402	18,348
UCAP available	9,115	9,835	10,225	9,027	9,115	14,835	9,200	11,625	12,170	10,375	9,402	18,348
% excess	5.9%	0.0%	0.0%	0.0%	5.9%	0.0%	5.9%	0.0%	0.0%	0.0%	0.0%	0.0%
Clearing price	**$143.42**	**$213.92**	**$213.92**	**$213.92**	**$143.42**	**$213.92**	**$159.10**	**$236.19**	**$236.19**	**$236.19**	**$236.19**	**$236.19**

For NYC, the additional load from building electrification causes the baseline capacity price, which is below net CONE, to increase to the same level as the NYC net CONE to incentivize construction of new capacity resources and ensure adequacy of resources. The NYC peak load increase cascades to the G-J and NYCA regions, causing price increase in these regions although there still remains surplus generation in both zones. NYCA and G-J prices are relevant as NYC load, in addition to purchasing in-city capacity to meet its LCR, needs to pay for additional capacity purchased in the G-J locality to meet the G-J LCR and additional capacity purchased in the NYCA zone to meet the overall statewide installed capacity requirement.

TESTIMONY OF HOWARD STYLES, TRAINING DIRECTOR
IUOE LOCAL 94-94A-94B-94C
BEFORE THE CITY COUNCIL COMMITTEE ON
ENVIRONMENTAL PROTECTION
HON. COSTA CONSTANTINIDES,
CHAIRPERSON
TUESDAY, DECEMBER 4, 2018

GOOD DAY CHAIRPERSON CONSTANTINIDES AND MEMBERS OF THE COMMITTEE. I WANT TO THANK YOU WELCOMING US HERE TODAY.

MY NAME IS HOWARD STYLES, I AM THE TRAINING DIRECTOR OF THE IUOE LOCAL 94 TRAINING CENTER. OUR MEMBERS ARE THE ENGINEERS RESPONSIBLE FOR OPERATING THE MOST SOPHISTICATED MECHANICAL AND ENERGY SYSTEMS IN NEW YORK CITY'S MOST ICONIC OFFICE BUILDINGS, HOTELS, RESIDENTAL COMPLEXES AND PUBLIC SCHOOLS.

AS THE ENGINEERS, MECHANICS, ASSISTANT AND CHIEF ENGINEERS, OUR MEMBERS ALSO HOLD CERTIFICATIONS RELATED TO THIS AREA OF EXPERTISE SUCH AS ENERGY CONSERVSTION, BOC, AND GPRO CERTIFICATIONS. OUR KNOWLEDGE AND UNDERSTANDING EXTENDS BEYOND THE MACHINERY WE OPERATE. WE ARE RESPONSIBLE FOR THE EFFICIENCY OF OUR BUILDINGS SYSTEMS.

WE ARE ESPECIALLY PROUD OF OUR LONG-STANDING AND POSITIVE RELATIONSHIP WITH THE DEPARTMENT OF BUILDINGS, AND WE HAVE OFTEN WORKED WITH THE DEPARTMENT IN THE DEVELOPMENT OF SAFETY CODES AND REGULATIONS.

OUR MEMBERS TAKE GREAT PRIDE IN PROVIDING CLEAN AND EFFICIENT ENERGY, WE WELCOME THE OPPORTUNITY TO JOIN AND SUPPORT THIS EFFORT BY THE CITY OF NEW YORK TO ACHIEVE REDUCTIONS IN GREENHOUSE GAS EMISSIONS.

HOWEVER, AS MUCH AS WE SUPPORT THE NEW INITIATIVES, WE HAVE SERIOUS AND GENUINE CONCERNS SURROUNDING THE PROPOSED LANGUAGE REGARDING THE OVERALL OPERATIONAL STANDARDS FOR IMPLEMENTING THE NEW CARBON REDUCTION BY 2050 PLAN.

I AM EXTREMEMLY PROUD TO TELL YOU THE ENGINEERS OF LOCAL 94 ARE REKNOWNED THROUGHOUT THE INDUSTRY FOR THEIR SKILLS IN THE EFFICIENT OPERATION OF LARGE BUILDINGS, AND WE WILL CONTINUE TO RAISE THE BAR. MORE IMPORTANTLY, WHAT IS NEEDED IS A GENERAL STANDARD OF OPERATION THAT SHOULD BE WIDELY USED AND ADAPTED ACROSS THE INDUSTRY. MORE EMPHASIS MUST BE PLACED ON TRAINING AND CERTIFICATION OF THE OPERATIONAL PRODEDURES OF THE PROPOSED PLAN. BECAUSE BUILDING EMISSIONS REDUCTIONS WILL ONLY BE ACHIEVED WHEN FACILITY PERSONEL ARE EQUIPPED WITH THE SKILLS TO RUN NEW SYSTEMS AT PEAK PERFORMANCE.

AS THIS LEGISLATION CALLS FOR THE CREATION OF AN ADVISORY BOARD, WE ANTICIPATE THE FIRST ORDER OF BUSINESS WOULD BE THE DEVELOPMENT OF STANDARDS FOR TRAINING, CERTIFICATION AND CONTINUING EDUCATION.

LOCAL 94 WOULD WELCOME THE OPPORTUNITY TO HAVE A VOICE ON THAT BOARD. WE REMAIN WILLING TO ASSIST IN THE FORMATION OF A TRAINING/CERTIFICATION FOR ALL NYC BUILDING OPERATORS.

THANK YOU AGAIN FOR THIS OPPORTUNITY TO BE HEARD, AND I WILL BE HAPPY TO ANSWER ANY QUESTIONS.

urban green

Testimony by John Mandyck
CEO, Urban Green Council
Before the New York City Council Committee on Environmental Protection
Re: Intros 1251, 1252 and 1253

December 4, 2018

Mr. Chairman, members of the committee, my name is John Mandyck and I am pleased to deliver this testimony as CEO of Urban Green Council. Russell Unger is out of town on a previously scheduled trip, or otherwise would have joined me.

Urban Green is a multi-stakeholder non-profit organization dedicated to transforming New York City buildings for a sustainable future. We do this by convening experts on our most critical issues, by providing research that informs policy and drives national conversations, by working with you and your colleagues in government to advocate for needed policy solutions, and by providing knowledge and training to support the 21st century green economy in New York and 13 cities in the U.S, and Canada.

The Blueprint for Efficiency that we delivered to you this fall represents the best of Urban Green. Over the course of eight months and 85 meetings, we convened the 80x50 Buildings Partnership, which includes 70 experts from 40 diverse organizations. We arrived at 21 actionable recommendations for building efficiency that will deliver the largest carbon reduction in the history of New York City.

The Blueprint represents the shared thinking of the city's major building and environmental stakeholders.

When we convened our partners last year, the outcome was completely uncertain. We didn't know if the parties would come. We didn't know if workable ideas could surface. We didn't know if consensus was possible. We didn't know if the outcome would matter to policymakers.

Almost a year later, we're at a hearing where the Blueprint for Efficiency serves as the basis for historic legislation. That happened because those that rarely agreed came together to find a better way. That shared thinking is powerful and it's the essential ingredient that has been missing in most global climate policy debates. But not here. Not now. So Urban Green thanks the 40 organizations in the Buildings Partnership that make this day possible.

Urban Green Council
U. S. Green
Building Council
New York

55 Broad Street
9th Floor
New York, NY 10004

Phone (212) 514-9385
Fax (212) 487-9504
urbangreencouncil.org

We also thank the Mayor who rightly started this conversation and we thank you Mr. Chairman for your continued leadership with landmark legislation for our sustainable future. We also thank Speaker Corey Johnson and the other co-sponsors of this critical bill.

Buildings are the answer to our low-carbon future. They are the single largest source of our carbon emissions. So, the future of sustainability and the future of buildings clearly go hand in hand. Globally, buildings consume about 30 percent of energy, nationally buildings consume 40 percent of energy, but in New York City, buildings consume nearly 80 percent of energy.

We'll never get to our 80x50 requirements without workable policies that lower the energy consumption of our existing buildings. That's exactly what the Blueprint for Efficiency delivers: a 20 percent reduction in energy use for 50,000 of our largest buildings between 2020 and 2030.

We're grateful, Mr. Chairman, that the bill before us represents many of the Blueprint's elements, including a process for creating a new building performance metric, a new office of building energy performance, a strong and representative stakeholder advisory board, and a program for assisting building owners. And we strongly support the collective aim of an effective and long-term building emissions reduction policy.

But we have more work to do for the legislation to include all elements of the Blueprint and the careful balance that was reached among all parties of the Buildings Partnership. We pledge to work with you, your colleagues, and members of the Buildings Partnership to make that happen.

With that goal in mind, the following are Urban Green Council's key areas of concern, which also represent the priorities of many members of the Buildings Partnership:

1. **The proposed early requirements are not feasible in present form.**

   Requirements that would necessitate significant capital improvements in a short period of time are not feasible, in part because of the time required for planning, financing, implementing, and assessing building upgrades.

   Moreover, a policy based on an energy or emissions metric must account for the significant variety of factors influencing energy use (and thus carbon emissions) in large NYC buildings, such as hours of operation, density, and type of activity. A metric based only on building area and occupancy classification is inadequate, as it will not reliably identify wasteful or inefficient buildings.

Given these concerns, the proposed approach for early requirements starting in 2022 is unfeasible in its present form. Members of the Partnership believe there are alternative, more practicable approaches to delivering energy and carbon reductions in the early 2020s. While we have not yet agreed on any particular path, options include requirements based on percentage reductions or on the existing Energy Star metric (which accounts for factors like operating hours). For greater flexibility, owners could have the option of choosing their own path.

2. The proposed backstop is not feasible in present form.

Default requirements must reflect a feasible timeline and stringency. The proposed default emissions intensity requirements starting in 2024 would necessitate major upgrades in tens of thousands of large buildings over four years. These requirements would drive massive cost inflation and result in a large proportion of buildings falling short. Also, the stringency of the proposed backstop targets is based on incomplete data, since we don't yet have benchmarking information for buildings between 25,000 and 50,000 square feet.

These default provisions may also be unnecessary. The legislated mandate for the Department of Buildings to develop a workable metric and building performance requirements, based on advice of the newly created advisory committee is legally enforceable. Setting detailed and attainable building-level default requirements will require significant time and effort – time that could take away from other elements of what's already a highly intricate policy.

If the goal of the default requirements is to ensure a minimum level of reductions, sector-level energy or emissions targets are preferable. This is the approach in the Blueprint for Efficiency, which proposed a 20 percent source energy reduction for each major building sector.

It remains critical to send a long-term signal to the market so building owners integrate energy efficiency into capital planning as soon as possible. Potential means to achieve that end include:

- Accelerating the schedule for development of the new metric and associated building-level targets;
- Coupling sector-level targets with example retrofit pathways for typical buildings; and
- Amending the audit and retrocommissioning law to provide an option for owners to submit a capital plan instead of an audit for the second compliance cycle.

3. **Building owners need support and flexibility for successful implementation.**

Successful and cost-effective implementation of widescale emissions reductions depends on government support for owners. The inclusion of a program for assistance to owners and the creation of a sustainable energy (PACE) loan program are strong steps in the right direction. Further developing the plan for government support must remain a priority, including targeted subsidies for nonprofit organizations.

Flexibility in compliance is also critical for successful implementation. As recommended in the Blueprint for Efficiency, the policy should include a requirement to develop a compliance option based on efficiency or emissions trading, on the condition that initial study demonstrates such a program is feasible, effective, and reflective of environmental justice concerns.

Addressing regulatory barriers to energy efficiency will also make emissions reductions easier and less costly for owners. The Blueprint for Efficiency includes several recommendations to achieve this end that should be reflected in Intro 1253 or companion bills, such as removing the month of May from the heating season, streamlining façade inspections, and requiring the city to study ways to facilitate access to tenant spaces for legitimate efficiency upgrades.

4. **Buildings with rent-regulated units can't be left behind.**

Buildings with at least one rent-stabilized or rent-controlled unit make up about 40 percent of large multifamily building area. The proposed full exemption of these buildings would be a major barrier to climate progress.

Based on the consensus approach in the Blueprint for Efficiency, requirements for this sector should include energy conservation measures that do not qualify for rent increases based on Major Capital Improvements (MCIs). That means including measures beyond those in the audit and retrocommissioning law, such as installation of radiator temperature control valves, replacement of steam traps, upgrading master vents, or installation of radiant barriers behind radiators.

The bill should also include a provision to adjust requirements for rent-regulated buildings if the current MCI regime changes substantially.

5. **Building energy grades should come after the development of the new metric.**

The energy performance bill proposes development of a new building performance metric tailored to New York City buildings. The existing energy grades law (Local Law 33 of 2018) should be amended to take effect after this new metric is created,

and to utilize this same metric as the basis of the energy grades. This will ensure consistency across the city's building energy requirements.

Removing my Buildings Partnership hat and speaking for Urban Green, I'll conclude with a few thoughts:

This legislation is critical to reaching our 80x50 mandate. And reaching 80x50 is necessary to demonstrate New York City's climate leadership. We have a lot at stake: New York State has $3 trillion of insured coastal properties – including New York City homes, apartments, shops and office buildings – more than any other state in the country. Yet when we reach 80x50, the effects of climate change and the devasting impact of rising waters in New York harbor will still occur if other cities around the world do not follow.

For others to do so, we need public policies that both work in New York and are exportable around the world. That's our best shot to save our city from the worst impacts of climate change.

Based on my prior 25-year buildings industry experience working in 53 countries, the Blueprint offers at least two policies that are scalable globally:

1. First is the manner by which we propose to measure building energy efficiency. Measuring efficiency sounds straightforward, but in its implementation we've often seen that the "one size fits most" approach doesn't work. Buildings that have high occupant density, trading floors and data centers are generally measured the same as buildings of identical size but with big office suites, lower density characteristics, and shorter operating hours. We have to measure buildings practically as they function, and that's exactly what the Blueprint proposes. Our recipe can work in other cities.

2. Second is the proposal to trade energy efficiency credits among buildings. This would be a first in the world at the scale we propose. In its simplest terms, we call for a 20 percent reduction in building energy use. If Building A achieves a 30 percent reduction but Building B can only reach 10 percent, Building B should be able to buy the extra 10 percent from Building A. The environmental benefit is the same because 20 percent would still be achieved overall.

   To retrofit 50,000 buildings in an unprecedented 10 years, we need flexible policies and mechanisms like efficiency trading to get there.

   And, to unlock efficiencies in residential buildings, where the largest share – 44 percent – of energy is used in New York City, we need new sources of capital that efficiency trading can provide to update aging mechanical and lighting systems. One could imagine, for example, energy services companies completing those upgrades

in residential buildings – on their own dime – in order to trade the efficiency credit.

Some stakeholders have voiced caution on trading systems in general, especially concerns about potential impacts on low-income communities, such as market mechanisms that could lead to underinvesting in these communities. But what if we gave higher credit in affordable housing or priority neighborhoods versus commercial properties to encourage the direct benefit in those neighborhoods? Good policy design can answer the concerns we hear.

We have the world's trading expertise right here in New York City to get this right. And when we do get it right, it is immediately exportable to cities around the country and around the world, with Urban Green ready to help scale the solution.

Today's legislation isn't just about how we get to 80x50, it has to also be about how we provide policy tools that can work far beyond New York. That's our best shot to stem the rising tide in New York harbor.

Mr. Chairman, your leadership and that of the committee will be crucial. We thank you for your focus. We thank you for this moment. Urban Green looks forward to working closely with you to incorporate all aspects of our consensus-based Blueprint for Efficiency into your legislation.

Sincerely,

John Mandyck
Chief Executive Officer
Urban Green Council

Appendix

Summary Table of Issues and Recommendations

Issue	Recommendation
The proposed early (2022) requirements are not feasible in present form because they do not account for the significant variety of factors influencing energy use, such as operating hours, density, and type of activity. They would also necessitate significant capital improvements in many buildings in an unreasonably short period of time.	Develop a different, more practicable approach to deliver energy and carbon reductions in the early 2020s. Options include requirements based on percentage reductions in energy use or on the existing Energy Star metric (which accounts for factors like operating hours). For greater flexibility, owners could have the option of choosing from multiple compliance paths.
The proposed backstop is not feasible in present form because it does not reflect a feasible timeline and stringency and is based on incomplete data. The proposed requirements would drive massive cost inflation and result in a large proportion of buildings falling short.	To ensure a minimum level of reductions, set sector-level energy or emissions targets as recommended in the Blueprint for Efficiency (20 percent energy reductions by 2030). To send a long-term signal to building owners to integrate energy efficiency into capital planning as soon as possible, consider: • Accelerating the schedule for development of the new metric and associated building-level targets; • Coupling sector-level targets with example retrofit pathways for typical buildings; and • Amending the audit and retrocommissioning law to provide an option for owners to submit a capital plan instead of an audit for the second compliance cycle.
Successful implementation depends on support for building owners and flexibility in compliance.	As detailed in the Blueprint for Efficiency: • Ensure that developing the plan for government support remains a priority, including targeted subsidies for nonprofit organizations; • Require development of a compliance option based on efficiency or emissions credit trading, conditioned on a study demonstrating such a program is feasible, effective, and reflective of environmental justice concerns; and • Address existing regulatory barriers to energy efficiency, including by removing May from

	the heating season, streamlining façade inspections, and studying ways to facilitate access to tenant spaces for efficiency upgrades.
Excluding buildings with rent-regulated units from the legislation represents a major barrier to climate progress and will leave these buildings behind.	As detailed in the Blueprint for Efficiency, requirements for this sector should include energy conservation measures that do not qualify for rent increases based on Major Capital Improvements (MCIs), such as installation of radiator temperature control valves, replacement of steam traps, upgrading master vents, or installation of radiant barriers behind radiators. The bill should also include a provision to adjust requirements for rent-regulated buildings if the current MCI regime changes substantially.
The city's building energy grade law is based on Energy Star, while Intro 1253 contemplates the development of a new building performance metric, creating the potential for substantial confusion around two different building performance programs.	Amend the existing energy grades law to take effect after the creation of the new metric, utilizing the new metric to ensure consistency across the city's building energy requirements.

GOTHAM 360
Innovative Energy Solutions

48 Wall Street, 5th Floor
New York, NY 10005
917.338.1023

Nicholas A. Widzowski
Legislative Director & Counsel
Office of Council Member Costa Constantinides
31-09 Newtown Avenue
Astoria, NY 11102

December 4, 2018

Re: Int 1253-2018
Commitment to achieve certain reductions in greenhouse gas emissions by 2050

To Whom It May Concern:

I am the founder of a full-service energy management & sustainability consultancy, Gotham Energy 360. We are headquartered in New York City and work with some of the largest energy consumers in the five boroughs including Columbia University, NewYork-Presbyterian Hospital, Montefiore Academic Medical Center, NYU Langone Medical Center, and Rockefeller University.

We are writing today to file our comments upon review of the proposed Local Law to amend the New York city charter and the administrative code of the city of New York, in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2050.

Our firm has supported the development of voluntary greenhouse gas inventories across our portfolio of clients over the past ten years, promoting participation in the Mayoral Carbon Challenge first under the PlaNYC initiative and later transitioning to the One City Built to Last program. We strongly believe in the need for programs such as these to achieve the much-needed reductions in greenhouse gas emissions to combat the impacts of climate change. We have further worked with large organizations to comply with Local Law 84 to benchmark their building's energy use, Local Law 87 to develop energy master plans & direct retrocommissioning efforts, and plan for the upcoming Local Law 88 which mandates lighting controls and retrofits as well as submetering.

The Mayoral Carbon Challenge, in tandem with the Local Laws listed above have resulted in the voluntary investment of hundreds of millions of dollars in efficiency, resiliency, and infrastructure upgrades across our portfolio of large institutional clients. This collective investment has also driven many thousands of metric tons of CO2e reductions, providing great benefit to both the individual organizations, the City, and the local utility.

While we also strongly support the spirit of this new initiative, we are troubled by a lack of specificity in the way that the greenhouse gas emissions will be accounted for, and we have concerns that the penalties put forth will be punitive and will result in diverting funds that could otherwise be invested in energy efficiency & implementation of technologies to reduce greenhouse gases, in opposition of the intent of the legislation.

GOTHAM360
Innovative Energy Solutions

48 Wall Street, 5th Floor
New York, NY 10005
917.338.1023

We believe the following issues must be addressed in order to wholeheartedly support the enactment of this new Local Law.

1. Assessing steep financial penalties starting in the year 2022 does not allow for an appropriate period of development for possible solutions. This cycle would generally encompass feasibility study, engineering & design, funding approvals, construction, and commissioning. All of these activities are usually subject to competitive bid which can also add to the overall timeline.

2. This legislation does not provide proper credit to technologies such as combined heat & power or fuel cells, both of which are heavily promoted through financial incentives by the New York State Energy Research and Development Authority ("NYSERDA"). Combined heat & power systems can be up to 80% efficient, taking into consideration the recovery and re-use of heat when compared to standard utility power generation of 33% efficiency. Fuel cells utilize natural gas as a source fuel, but in a chemical reaction vs. a combustion process. This process results in greatly reduced, if not eliminated entirely, greenhouse gas emissions. Hospitals and Universities are migrating toward these technologies as they provide a series of benefits in addition to the improvement of efficiency including operational cost savings and enhanced resiliency. We would propose a full exemption for buildings within the five boroughs who utilize combined heat and power systems or other distributed energy technologies that achieve a total system efficiency of 65% or higher.

3. A Hospital (categorized as group I) is subject to the same greenhouse gas limitations under this proposed legislation as a standard commercial office building, which is categorized under group B, which is 0.008552 ton CO2e/sf. Hospitals have operating profiles that run 24/7/365 while most commercial office buildings are closed over weekends and holidays. In addition, the presence of medical equipment, imaging, research, and state of the art computing drive a higher energy intensity and are required to provide top quality healthcare services to the population of the greater New York metro area.

4. A University or not for profit Research Center would also be categorized under group B, which does not take into consideration the level of energy intensity required to produce top level biomedical and other technology driven research. This activity drives significant economic growth to the City and should be recognized as being exempt from this legislation entirely.

5. We would respectfully propose a significantly higher cap on greenhouse gas emissions for Universities employing research and for all hospital buildings in recognition of the type of energy intensity required to perform these activities.

GOTHAM360
Innovative Energy Solutions

48 Wall Street, 5th Floor
New York, NY 10005
917.338.1023

6. There is great difficulty in planning for the impact of this proposed legislation without a stated accounting method, inclusive of coefficients for all source energy types. Many different methods exist for accounting for greenhouse gas emissions, and the results can vary dramatically.

7. The legislation should be amended to account for district energy systems. District energy systems are centralized systems producing utilities which may include steam, hot water, power, chilled water, or any combination thereof and then distribute those utilities to a series of other buildings. Under this legislation, the energy consumed by the district system would apply to the building where that system is located, while the distribution of utilities is not accounted for in the buildings where those utilities are consumed. We would respectfully propose the legislation take these systems into consideration and evaluate a methodology that would properly attribute the allocation of greenhouse gas emissions across the connected buildings.

In conclusion, we support the spirit of the legislation and we applaud the City Council on the progressive nature of this draft bill. Climate change is a clear threat to the economic growth of our city and represents a significant safety risk to our population. There is a clear need to promote greenhouse gas emission reductions beyond voluntary accounting and reporting, without the levy of punitive fines that would divert funding and investment away from the deployment of economically viable solutions.

Sincerely,

Jennifer Kearney
Executive Partner
Gotham Energy 360 LLC

GOTHAM 360
Innovative Energy Solutions

48 Wall Street, 5th Floor
New York, NY 10005
917.338.1023

Nicholas A. Widzowski
Legislative Director & Counsel
Office of Council Member Costa Constantinides
31-09 Newtown Avenue
Astoria, NY 11102

December 4, 2018

Re: Int 1253-2018
Commitment to achieve certain reductions in greenhouse gas emissions by 2050

To Whom It May Concern:

I am the founder of a full-service energy management & sustainability consultancy, Gotham Energy 360. We are headquartered in New York City and work with some of the largest energy consumers in the five boroughs including Columbia University, NewYork-Presbyterian Hospital, Montefiore Academic Medical Center, NYU Langone Medical Center, and Rockefeller University.

We are writing today to file our comments upon review of the proposed Local Law to amend the New York city charter and the administrative code of the city of New York, in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2050.

Our firm has supported the development of voluntary greenhouse gas inventories across our portfolio of clients over the past ten years, promoting participation in the Mayoral Carbon Challenge first under the PlaNYC initiative and later transitioning to the One City Built to Last program. We strongly believe in the need for programs such as these to achieve the much-needed reductions in greenhouse gas emissions to combat the impacts of climate change. We have further worked with large organizations to comply with Local Law 84 to benchmark their building's energy use, Local Law 87 to develop energy master plans & direct retrocommissioning efforts, and plan for the upcoming Local Law 88 which mandates lighting controls and retrofits as well as submetering.

The Mayoral Carbon Challenge, in tandem with the Local Laws listed above have resulted in the voluntary investment of hundreds of millions of dollars in efficiency, resiliency, and infrastructure upgrades across our portfolio of large institutional clients. This collective investment has also driven many thousands of metric tons of CO2e reductions, providing great benefit to both the individual organizations, the City, and the local utility.

While we also strongly support the spirit of this new initiative, we are troubled by a lack of specificity in the way that the greenhouse gas emissions will be accounted for, and we have concerns that the penalties put forth will be punitive and will result in diverting funds that could otherwise be invested in energy efficiency & implementation of technologies to reduce greenhouse gases, in opposition of the intent of the legislation.

GOTHAM360
Innovative Energy Solutions

48 Wall Street, 5th Floor
New York, NY 10005
917.338.1023

We believe the following issues must be addressed in order to wholeheartedly support the enactment of this new Local Law.

1. Assessing steep financial penalties starting in the year 2022 does not allow for an appropriate period of development for possible solutions. This cycle would generally encompass feasibility study, engineering & design, funding approvals, construction, and commissioning. All of these activities are usually subject to competitive bid which can also add to the overall timeline.

2. This legislation does not provide proper credit to technologies such as combined heat & power or fuel cells, both of which are heavily promoted through financial incentives by the New York State Energy Research and Development Authority ("NYSERDA"). Combined heat & power systems can be up to 80% efficient, taking into consideration the recovery and re-use of heat when compared to standard utility power generation of 33% efficiency. Fuel cells utilize natural gas as a source fuel, but in a chemical reaction vs. a combustion process. This process results in greatly reduced, if not eliminated entirely, greenhouse gas emissions. Hospitals and Universities are migrating toward these technologies as they provide a series of benefits in addition to the improvement of efficiency including operational cost savings and enhanced resiliency. We would propose a full exemption for buildings within the five boroughs who utilize combined heat and power systems or other distributed energy technologies that achieve a total system efficiency of 65% or higher.

3. A Hospital (categorized as group I) is subject to the same greenhouse gas limitations under this proposed legislation as a standard commercial office building, which is categorized under group B, which is 0.008552 ton CO2e/sf. Hospitals have operating profiles that run 24/7/365 while most commercial office buildings are closed over weekends and holidays. In addition, the presence of medical equipment, imaging, research, and state of the art computing drive a higher energy intensity and are required to provide top quality healthcare services to the population of the greater New York metro area.

4. A University or not for profit Research Center would also be categorized under group B, which does not take into consideration the level of energy intensity required to produce top level biomedical and other technology driven research. This activity drives significant economic growth to the City and should be recognized as being exempt from this legislation entirely.

5. We would respectfully propose a significantly higher cap on greenhouse gas emissions for Universities employing research and for all hospital buildings in recognition of the type of energy intensity required to perform these activities.

GOTHAM 360
Innovative Energy Solutions

48 Wall Street, 5th Floor
New York, NY 10005
917.338.1023

6. There is great difficulty in planning for the impact of this proposed legislation without a stated accounting method, inclusive of coefficients for all source energy types. Many different methods exist for accounting for greenhouse gas emissions, and the results can vary dramatically.

7. The legislation should be amended to account for district energy systems. District energy systems are centralized systems producing utilities which may include steam, hot water, power, chilled water, or any combination thereof and then distribute those utilities to a series of other buildings. Under this legislation, the energy consumed by the district system would apply to the building where that system is located, while the distribution of utilities is not accounted for in the buildings where those utilities are consumed. We would respectfully propose the legislation take these systems into consideration and evaluate a methodology that would properly attribute the allocation of greenhouse gas emissions across the connected buildings.

In conclusion, we support the spirit of the legislation and we applaud the City Council on the progressive nature of this draft bill. Climate change is a clear threat to the economic growth of our city and represents a significant safety risk to our population. There is a clear need to promote greenhouse gas emission reductions beyond voluntary accounting and reporting, without the levy of punitive fines that would divert funding and investment away from the deployment of economically viable solutions.

Sincerely,

Jennifer Kearney
Executive Partner
Gotham Energy 360 LLC

SOLARone | GREEN ENERGY, ARTS & EDUCATION CENTER
24-20 FDR Drive Service Road East, New York, NY 10010
T 212-505-6050 F 212-253-2467 www.Solar1.org

December 4, 2018

New York City Council
Committee on Environmental Protection
City Hall Park
New York, NY 10007

FOR THE RECORD

Re: Property Assessed Clean Energy (PACE) Financing for the City of New York

Dear Councilmember Constantinides,

Solar One is pleased to provide this testimony in support of Int 1252-2018, a Local Law which would authorize the establishment of a PACE financing program for the City of New York.

Founded in 2004, Solar One is an environmental education nonprofit that runs diverse programs to bring the benefits of clean energy to all New Yorkers. Our Here Comes Solar program facilitates solar projects in New York City's underserved communities by providing technical assistance to affordable housing providers, non-profits and others to identify viable solar projects, secure financing and select qualified solar installation partners. Since 2014 we have completed predevelopment for more than 450 rooftop solar projects in NYC, representing approximately $35 million in investment, primarily on affordable housing. For many of our participating buildings, the upfront cost of installing solar is the single greatest barrier to adoption. And despite the efforts of mission-driven lenders, cost-effective financing options for mid-sized solar projects, which are typical of the non-profit and multifamily market segments, can still be hard to find in New York City.

PACE could help address this gap. PACE is an innovative financing mechanism through which loans are made for cost-effective clean energy projects and repaid through an assessment on building owner property tax bills. PACE provides several key benefits versus other financing options, including:

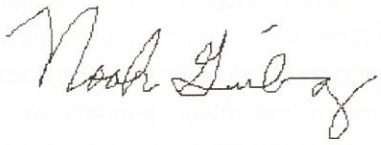
- The potential for longer term loans, which enable a greater number of clean energy projects to be financially viable/cash flow positive from day one.
- Reduced risk for lenders, and consequently reduced interest rates for borrowers, due to the reliability of a municipal bill collection mechanism.
- Reduced concern from building owners regarding rapid investment recovery because PACE loans/assessments stay with the building that benefits from the clean energy project even after a transfer of ownership for the property.

- The potential for New York City to expand access to underserved market segments such as affordable housing through program design and the targeted use of low cost capital[1].

In New York City, PACE can be particularly beneficial to the small commercial, multifamily and non-profit sectors that have limited access to zero-down solar financing options such as a lease or power purchase agreement (PPA). New York City's building topology and the prevalence of small/medium-sized multifamily buildings require diverse financing mechanisms to overcome financial barriers to cost-effective renewable energy and energy efficiency projects. PACE is one important financing mechanism that can help a greater number of solar projects come to fruition in the City, expanding access to solar for underserved communities while empowering them to make a meaningful contribution toward our City's ambitious clean energy goals.

We applaud the New York City Council Committee on Environmental Protection, and your colleagues in the Mayor's Office of Sustainability, for your leadership and encourage the Council to vote in favor of this important legislation. If enacted, we look forward to engaging with the administering agency and the New York City Energy Efficiency Corporation (NYCEEC) to provide feedback regarding program design and to promote PACE financing among Here Comes Solar program participants.

Sincerely,



Noah Ginsburg
Director, Here Comes Solar
Solar One
347-509-6044
noah@solar1.org

---

[1] Energize NY, New York State's opt-in PACE financing program administrator, has financed clean energy projects utilizing a variety of sources include Qualified Energy Conservation Bonds which allowed it to offer enhanced interest rates (source: Energize NY, http://energizeny.org/news/detail/energize-ny-finances-solar-panels-for-a-catholic-church#.XAVsqdtKipq, accessed December 3, 2018). Such an approach could allow the City's PACE financing program administrator to offer enhanced interest rates for projects that further the City's objectives, such as affordable housing preservation.

FOR THE RECORD

December 2, 2018

FOR THE RECORD

Dear Councilmember,

On behalf of The Beacon School Environmental Club, I am offering this testimony in support of the "Dirty Buildings" Bill. Councilmember Costa Constantinides, with Speaker Johnson's support, is introducing legislation to fight climate change by holding large, "dirty" buildings accountable for their colossal negative impact on the environment, while simultaneously creating good jobs and cleaning the air.

Currently, energy use by big buildings generates approximately 70% of New York City's immense climate pollution, and large buildings (over 25,000 square feet) are the cause of half of this, or about 30% of the city's air pollution. This bill would force larger buildings to upgrade their modern energy efficiency standards, ensuring that big buildings reach over 40% pollution cuts by 2030, and 80% by 2050. This bill is especially pertinent today because of recent research released by the United Nations, stating that action against climate change needs to be taken soon, or else many of the negative effects that humans have made on the planet will become irreversible; luckily, cutting climate change at the rate that this bill proposes meets the levels that the world's scientists at the U.N. say are necessary to prevent the planet from reaching permanent levels of environmental damage and climate change.

The bill would also create thousands of good jobs, yearly, especially for communities of color in construction or renovation. Energy efficiency upgrades are hands-on work; upgrades create jobs in anything from lighting upgrades to improved insulation to new building systems such as boilers. Moreover, this bill would result in cleaner air for New Yorkers, protecting our lungs from asthma and other health conditions.

This legislation is the first and most effective of its kind in the world. Not only is it important that New York City be the first to hold big buildings accountable for their energy use because it is one of the leading cities in the world, but it is also necessary for the livelihood of the city and

it's 8.6 million residents. If action is not taken soon, the climate crisis will cause our city to drown in the coming decades.

That is why, on behalf of The Beacon School Environmental Club, I am asking the Councilmember to co-sponsor and help pass this legislation, for the future of my generation, our city, and our planet.

Sincerely,
Nina Moske

Testimony on Intro 1253
Aditi Varshneya, Community Organizer at WE ACT for Environmental Justice
December 4th, 2018

My name is Adi Varshneya and I'm a community organizer with WE ACT for Environmental Justice. WE ACT is a member of the Climate Works for All coalition and supports Intro 1253.

New York City is a global leader on climate change. We were the first city in the world to create a plan to meet the goals of the Paris Climate Agreement - we stepped up and committed to the agreement despite our nation's short-sighted withdrawal. New York City can and should continue to lead and inspire other cities to take bold action on climate. Intro 1253 is a historic bill which not only hits the emissions reductions targets UN climate scientists deem necessary to avoid catastrophic climate change, but also addresses the needs of low-income communities and communities of color who are disproportionately burdened by the impacts of climate change.

This legislation has the potential to strengthen communities by creating thousands of good local jobs each year in fields like construction and renovation. This is especially meaningful for communities like ours in Northern Manhattan which suffer high rates of unemployment. The involvement and empowerment of labor is crucial to an equitable carbon-free future, and this bill would help New Yorkers of color participate in and directly benefit from the emergent clean energy economy.

Climate policy which meets ambitious emissions targets at the expense of affordable housing is displacement policy. That's why we support this bill's creation of an alternate compliance pathway for rent-regulated buildings in order to prevent unfair permanent rent increases through the state MCI rule. However, we urge the Council to consider incorporating the Urban Green Council Buildings Partnership's recommendations into Intro 1253: we proposed a prescribed set of low cost upgrades that would allow rent-regulated buildings to achieve additional energy efficiency gains on top of those produced by Local Law 87 while avoiding MCIs. This would make sure neighborhoods with high concentrations of rent-regulated buildings (like Washington Heights and Inwood, where 86% of total rental units are regulated) still benefit from air quality improvements from emissions reductions. Many of these same neighborhoods have

disproportionately high rates of asthma and respiratory illness - in some low-income areas of the city, the childhood asthma rate can be 1 in 4. Passing this bill will benefit our community health.

We would also like to caution against the inclusion of renewable energy credits as a method of alternative compliance. RECs do not improve local environmental health, support a thriving local economy, or even sufficiently move the needle on carbon reduction.

Climate change is happening, it will get worse, and it will cost us, especially those of us who are people of color or low-income. But most importantly, we can still do something about it. We thank Councilmember Constantinides and Speaker Johnson for their climate leadership and urge the council to enact this bill.

Intro 1253

My name is Ellen Osuna, a lifelong New Yorker who loves this city. Perhaps not everyone would agree with many of us who feel this is the best city in the world. **But what is undeniably true, is that NYC is among the most profoundly influential cities in the world. What we do here makes headlines, what we do here influences others ... if it can be done here, it can be done.**

Intro 1253 is estimated to cut pollution from large buildings by 40% by 2030, and over 80% by 2050, without needing rent hikes through the Major Capital Improvement law. The savings in greenhouse gasses, and air pollution, are significant given the size and number of NYC's large buildings. But then there's the un-calculatable reverbarations of pollution reduction from other cities, towns, countries who would follow our example. And then there's the fact that there is so little time left to take meaningful actions on climate change, for the sake of all beings on Earth, including not just future generations but **everyone alive now who hopes to live another decade or two.**

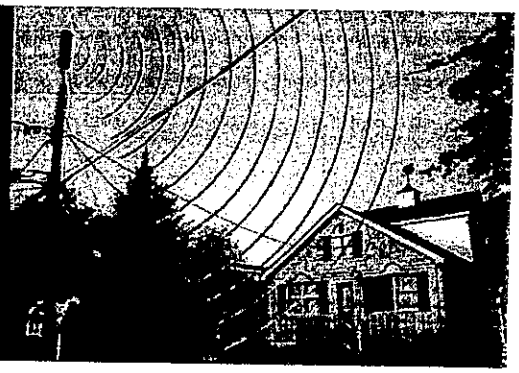
And then there's the predictable response from industries, reacting from fear and greed, and their statements of misinformation, sometimes outright lies, their attempts to nod agreement to the goal but then say that this proposal is not the best or only way to accomplish the goal. The Primary Reason humanity is in such a terrifying place, regarding climate, air, food, and water pollution, and justice of all kinds, is industry influence, misinformation, and financial influence. Each situation has different stories, different bill numbers, but again and again, governments serving forces of greed, and abdicating their responsibilities to the people, is the one mechanism that has brought so much destruction to the only planet we have.

Please, don't do that here. I've attended and watched other hearings where the real estate industry tries to block something if it might cut into their massive profits, and tries to ram through something if it will bring them more massive profits. 'And, in this city which has a growing reputation for being the plaything of the real estate industry, they usually get their way. And then of course there's the fossil fuel industry, which suppressed science on climate and pollution for decades. When the motivation is how will this affect the bottom line of the already rich, something should not be trusted. And yet time after time after time, politicians who campaign on protecting the people turn away from that responsibility. But every day there's more awareness of the connections between industry money, misinformation, and who can and can't be bought off. In Congress there's a growing call to renounce fossil fuel contributions. In NYC there's a growing call to renounce real estate contributions. And right here today is a growing call to Listen To The People who are motivated not by personal greed, but by understanding of climate issues, and a fierce beautiful love for this Earth.

In conclusion, energy does not have to be seen with the unaided human eye to have significant effect. Nuclear energy is not safe, green, renewable, carbon free, or sane. Also, while this is not the specific topic of this bill, it's important and timely enough that I'm including in my testimony provided to you, information on the beyond clear evidence of the serious health dangers of wireless radiation, specifically small cell 5G technology, which is **orders of magnitude more powerful to effect the health of everyone, especially - but not only - children, elderly, pets, and those like myself who do not have strong constitutions.** Of course, the industries behind this technology do all they can to suppress, deny, control, or not take seriously the mounting evidence of these harms. And of course, politicians who should be sounding the alarm are not, even as we are right on the cusp of 5G next level radiation blanketing NYC unless you stand up and say "Hold on, let's take a deeper, honest look at this." I know you folks are incredibly busy. But please, learn about the dangers of 5G wireless and protect us. Please don't cave to industries that want you to cater to them instead of doing what we elected you to do. Please pass Intro 1253. Please take seriously your task to protect this amazing, vulnerable, sacred city. Thank you.

Sincerely and urgently,
Ellen Osuna
73-63 260th St, Glen Oaks, NY 11004

5G Technology *vs.* Science and Freedom of Choice



5G is the next generation of wireless technology. It uses new types of radio-frequency (RF) microwave radiation to transmit large amounts of data, but it only works over short distances, requiring closer proximity to users and the dense deployment of antennas. The rollout of 5G will require a vast network of new, powerful antennas in neighborhoods all across America.

• Human exposure guidelines for RF microwave radiation used by the FCC are more than twenty years old, and address only **thermal, not biological** impacts of exposure, which have now been firmly established. The guidelines have been the subject of an open FCC docket since 2013 with no resolution, creating an **uncertain regulatory environment**.

• Over the last 20 years, **a robust body of independent science has emerged** showing significant biological impacts from exposure to RF microwave radiation, including "clear evidence" of cancer, neurological and cognitive harm, heart abnormalities, reproductive effects and microwave sickness among other serious health problems. Populations especially at risk include pregnant women, children, the elderly, individuals with implanted medical devices, or cardiac or neurological problems.

• More than **250 medical and public health professionals** have signed a joint statement urging government officials to consider the latest science on microwave radiation and human health, especially as it may be resulting in **abnormal brain development in unborn children**.

Children are especially at risk from wireless radiation

• **Freedom of choice is a fundamental American value.** The FCC and the telecom industry should not force American citizens to endure **involuntary exposure** to powerful wireless radiation 24/7 in their own homes.

• **Installing 5G antennas in residential areas is not required for public safety or national security.** The real purpose of the 5G rollout is to allow telecom companies to compete with cable companies to stream video, and to a lesser extent, to increase the capacity of "smart devices" and enable the "Internet of Things" (IOT). **5G is not a regulated public utility**.

* A complete Digest of Independent Science on Public Health Concerns Regarding Wireless Radiation is available at http://grassrootsinfo.org/emergingscience.php.

The theory that exposure to radio-frequency microwave radiation is not harmful to humans – the underlying principle of all federal legislation and regulations regarding wireless technologies – has been proven false.

Recent and Significant Health Studies on Wireless Microwave Radiation*

The National Institutes of Health study. This $30-million dollar study, conducted by the National Toxicology Program of the NIH, was designed to determine whether exposure to radio-frequency radiation from cell phones and other wireless devices could cause cancer. A review of the data by independent experts showed that the cause and effect relationship was actually much stronger than previously thought. Despite industry spin, experts have labeled this study as "clear evidence" of the link between RF microwave radiation and carcinogenicity.

The Ramazzini Institute Study. This study found that lab animals exposed to the radio-frequency radiation emitted by distant cell towers had a greater chance of developing heart tumors than those which were not exposed. This study, funded in part by the U. S. government, was the first large-scale study to show clear evidence of cancer risk from far-field exposures.

Cancer Epidemiology Update. This recent (September, 2018) study shows that the current scientific evidence supports the conclusion that RF microwave radiation is a proven cause of cancer. The paper reviews animal experimental evidence and human epidemiology studies (case-control, cohort, time trend and case studies) published after the World Health Organization's International Agency for Research on Cancer (IARC) categorized RF microwave radiation as a possible human carcinogen (Group 2B) in 2011.

The Reproductive Health Studies. Several recent studies have been conducted to investigate the direct influence of electromagnetic radiation on sperm. The conclusion of virtually all independent studies is that men who carried their phones in a pocket or on the belt were more likely to have lower sperm counts and/or more inactive or less mobile sperm. These findings corroborate similar results in laboratory animals.

* A Digest of Independent Science on Public Health Concerns Regarding Wireless Radiation, containing hundreds of peer-reviewed, published studies, is available at http://grassrootsinfo.org/emergingscience.php.

Americans for Responsible Technology
52 Main Street • Port Washington • New York • 11050 • www.AmericansForResponsibleTech.org

INDEX

Independent Science on the Effect of Wireless Radiation on Human Health
Updated November 2018

I. EFFECTS ON FETAL AND NEWBORN DEVELOPMENT

6. **Genotoxicity Induced by Foetal and Infant Exposure to Magnetic Fields and Modulation of Ionising Radiation Effects.** Udroiu, I., et al. *PLoS One* (2015). https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0142259

7. **Oxidative Stress of Brain and Liver is Increased by Wi-Fi (2.45 GHz) Exposure of Rats During Pregnancy and the Development of Newborns.** Çelik, Ö., et al. *Journal of Chemical Neuroanatomy* 75(Pt B):134-139 (2015). https://www.ncbi.nlm.nih.gov/pubmed/26520617

8. **Neurodegenerative Changes and Apoptosis Induced by Intrauterine and Extrauterine Exposure of Radiofrequency Radiation.** Güler, G., et al. *Journal of Chemical Neuroanatomy* 75(Pt B):128-133 (2015). https://www.ncbi.nlm.nih.gov/pubmed/26520616

9. **Maternal Exposure to a Continuous 900-MHz Electromagnetic Field Provokes Neuronal Loss and Pathological Changes in Cerebellum of 32-Day-Old Female Rat Offspring.** Odacı, E., et al. *Journal of Chemical Neuroanatomy* 75(Pt B):105-110 (2015). https://www.ncbi.nlm.nih.gov/pubmed/26391347

10. **Different Periods of Intrauterine Exposure to Electromagnetic Field: Influence on Female Rats' Fertility, Prenatal and Postnatal Development.** Alchalabi, A., et al. *Asian Pacific Journal of Reproduction* 5(1):14-23 (2015). https://www.sciencedirect.com/science/article/pii/S2305050015000536

11. **Use of Mobile Phone During Pregnancy and the Risk of Spontaneous Abortion.** Mahmoudabadi, F., et al. *Journal of Environmental Health Science and Engineering* 13:34 (2015). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4416385/

12. **Oxidative Mechanisims of Biological Activity of Low-Intensity Radiofrequency Radiation.** Yakymenko, I., et al. *Electromagnetic Biology and Medicine* 35(2):186-202 (2016). https://www.ncbi.nlm.nih.gov/pubmed/26151230

13. **Effects of Prenatal 900 MHz Electromagnetic Field Exposures on the Histology of Rat Kidney.** Ulubay, M., et al. *International Journal of Radiation Biology* 91(1):35-41 (2015). https://www.ncbi.nlm.nih.gov/pubmed/25084839

14. **The Effect of Exposure of Rats During Prenatal Period to Radiation Spreading from Mobile Phones on Renal Development.** Bedir, R., et al. *Renal Failure* 37(2):305-9 (2015). https://www.ncbi.nlm.nih.gov/pubmed/25691088?dopt=Abstract

15. **Dosimetric Study of Fetal Exposure to Uniform Magnetic Fields at 50 Hz.** Liorni, I., et al. *Bioelectromagnetics* 35(8):580-97 (2014). https://www.ncbi.nlm.nih.gov/pubmed/25266786

16. **Influence of Pregnancy Stage and Fetus Position on the Whole-Body and Local Exposure of the Fetus to RF-EMF.** Varsier, N. et al. *Physics in Medicine and Biology* 59(17):4913-26 (2014). https://www.ncbi.nlm.nih.gov/pubmed/25098501?dopt=Abstract

17. **Autism-Relevant Social Abnormalities in Mice Exposed Perinatally to Extremely Low Frequency Electromagnetic Fields.** Alsaeed, I., et al. *International Journal of Developmental Neuroscience* 37:58-6 (2014). https://www.ncbi.nlm.nih.gov/pubmed/24970316?dopt=Abstract

18. **Pyramidal Cell Loss in the Cornu Ammonis of 32-day-old Female Rats Following Exposure to a 900 Megahertz Electromagnetic Field During Prenatal Days 13–21.** Bas, O., et al. *NeuroQuantology* 11(4): 591-599 (2013). https://neuroquantology.com/index.php/journal/article/viewFile/701/625

19. **The Effects of 900 Megahertz Electromagnetic Field Applied in the Prenatal Period on Spinal Cord Morphology and Motor Behavior in Female Rat Pups.** Odaci, E., et al. *NeuroQuantology* 11(4): 573-581 (2013). https://www.neuroquantology.com/index.php/journal/article/view/698

20. **Fetal Radiofrequency Radiation Exposure From 800-1900 MHz-Rated Cellular Telephones Affects Neurodevelopment and Behavior in Mice.** Aldad, T., et al. *Science Reports* 2:312 (2012). https://www.nature.com/articles/srep00312

21. **Cranial and Postcranial Skeletal Variations Induced in Mouse Embryos by Mobile Phone Radiation.** Fragopoulou, AF., et al. *Pathophysiology* 17(3):169-77 (2010). https://www.ncbi.nlm.nih.gov/pubmed/19854628

22. **Dysbindin Modulates Prefrontal Cortical Glutamatergic Circuits and Working Memory Function in Mice.** Jentsch, JD., et al *Neuropsychopharmacology* 34, 2601–8 (2009). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2762021/

23. **Stress Signalling Pathways that Impair Prefrontal Cortex Structure and Function.** Arnsten, A. *National Review of Neuroscience* 10, 410–22 (2009). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2907136/

24. **Maternal Occupational Exposure to Extremely Low Frequency Magnetic Fields and the Risk of Brain Cancer in the Offspring.** Li, P, et al. *Cancer Causes & Control* 20(6):945-55 (2009). https://www.ncbi.nlm.nih.gov/pubmed/19224378

25. **Reproductive and Developmental Effects of EMF in Vertebrate Animal Models.** Pourlis, A.F. *Pathophysiology* 16(2-3):179-89 (2009). https://www.ncbi.nlm.nih.gov/pubmed/19272761

26. **Prenatal and Postnatal Exposure to Cell Phone Use and Behavioral Problems in Children.** Divan, HA., et al. *Epidemiology* 19(4):523-29 (2008). https://www.ncbi.nlm.nih.gov/pubmed/18467962

27. **Effects of Prenatal Exposure to a 900 MHz Electromagnetic Field on the Dentate Gyrus of Rats: A Stereological and Histopathological Study.** Odaci, E., et al. *Brain Research* 1238: 224–229 (2008). https://www.ncbi.nlm.nih.gov/pubmed/18761003

28. **Exposure to Cell Phone Radiation Up-Regulates Apoptosis Genes in Primary Cultures of Neurons and Astrocytes.** Zhao, T., et al. *Neuroscience Letters* 412: 34–38 (2007). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2713174/

29. **Cell Death Induced by GSM 900-MHz and DCS 1800-MHz Mobile Telephony Radiation.** Panagopoulos, DJ., et al. *Mutation Research* 626, 69–78 (2006). https://www.ncbi.nlm.nih.gov/pubmed/17045516

30. **Ultra High Frequency-Electromagnetic Field Irradiation During Pregnancy Leads to an Increase in Erythrocytes Micronuclei Incidence in Rat Offspring.** Ferreira, A., et al. *Life Sciences* 80(1):43-50 (2006). https://www.ncbi.nlm.nih.gov/pubmed/16978664

31. **Attention-Deficit Hyperactivity Disorder.** Biederman, J. & Faraone, S. V. *Lancet* 366(9506): 237–248 (2005). https://www.ncbi.nlm.nih.gov/pubmed/16023516

32. **Attention-Deficit/Hyperactivity Disorder: An Overview of the Etiology and a Review of the Literature Relating to the Correlates and Lifecourse Outcomes for Men and Women.** Brassett-Harknett, A. & Butler, N. *Clinical Psychology Review* 27(2): 188–210 (2005). http://europepmc.org/abstract/med/16081194

II. EFFECTS ON YOUNG CHILDREN

1. **Electromagnetic Fields, Pulsed Radiofrequency Radiation, and Epigenetics: How Wireless Technologies May Affect Childhood Development.** Sage, C. & Burgio, E. *Child Development* 89(1):129-136 (2017). https://www.ncbi.nlm.nih.gov/pubmed/28504324

2. **Prospective Cohort Analysis of Cellphone Use and Emotional and Behavioural Difficulties in Children.** Sudan, M., et al. *Journal of Epidemiology and Community Health* 70(12):1207-1213 (2016). https://www.ncbi.nlm.nih.gov/pubmed/27217533

3. **Why Children Absorb More Microwave Radiation than Adults: The Consequences.** Morgan, L., et al. *Journal of Microscopy and Ultrastructure* 2(4):196-204 (2014). https://www.sciencedirect.com/science/article/pii/S2213879X14000583

4. **Epidemiological Characteristics of Mobile Phone Ownership and Use in Korean Children and Adolescents.** Byun, Y., et al. *Environmental Health and Toxicology* 28 (2013). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3909745/

5. **A Prospective Study of In-Utero Exposure to Magnetic Fields and the Risk of Childhood Obesity.** Li, D., et al. *Scientific Reports* 2(540) (2012). https://www.nature.com/articles/srep00540

6. **Exposure to Extremely Low-Frequency Magnetic Fields and the Risk of Childhood Cancer: Update of the Epidemiological evidence.** Schüz, J. *Progress in Biophysics and Molecular Biology* 107(3):339-42 (2011). https://www.sciencedirect.com/science/article/pii/S0079610711001076

7. **Cell Phone Use and Behavioural Problems in Young Children.** Divan, HA., et al. *Journal of Epidemiol Community Health* 66(6):524-9 (2010). https://www.ncbi.nlm.nih.gov/pubmed/21138897

8. **Mobile Phones, Radiofrequency Fields, and Health Effects in Children-Epidemiological Studies.** Feychting, M. *Progress in Biophysics and Molecular Biology* 107(3):343-348 (2010). https://www.sciencedirect.com/science/article/pii/S0079610711001210

9. **Exposure to Radio-Frequency Electromagnetic Fields and Behavioral Problems in Bavarian Children and Adolescents.** Thomas, S., et al. *European Journal of Epidemiology* 25(2):135-41 (2009). https://link.springer.com/article/10.1007/s10654-009-9408-x

10. **The Sensitivity of Children to Electromagnetic Fields.** Kheifets, L., et al. *Deventer Journal of Pediatrics* 116(2):303-313 (2005). http://pediatrics.aappublications.org/content/116/2/e303

III. BRAIN TUMORS

1. **Report of Final Results Regarding Brain and Heart Tumors in Sprague-Dawley Rats Exposed From Prenatal Life Unitl Natural Death to Mobile Phone Radiofrequency Field Representative of a 1.8 GHz GSM Base Station Environmental Emission.** Falcioni, L, et al. *Environmental Research* (2018). https://www.ncbi.nlm.nih.gov/pubmed/29530389

2. **Brain Tumours: Rise in Glioblastoma Multiforme Incidence in England 1995-2015 Suggests an Adverse Envrionmental or Lifestyle Factor.** Philips, A., et al. *Journal of Environmental and Public Health* (2018). https://www.hindawi.com/journals/jeph/2018/7910754/

3. **The 2100 MHz Radiofrequency Radiation of a 3G-Mobile Phone and the DNA Oxidative Damage in Brain.** Sahin, D, et al. *Journal of Chemical Neuroanatomy* 75(Pt B):94-98 (2016). http://www.sciencedirect.com/science/article/pii/S0891061816000041

4. **Mobile Phone and Cordless Phone Use and the Risk for Glioma - Analysis of Pooled Case-Control Studies in Sweden 1997-2003 and 2007-2009.** Hardell, L. and Carlberg, M. *PathoPhysiology* 22(1):1-13 (2015). http://www.ncbi.nlm.nih.gov/pubmed/25466607

5. **Mobile Phone Radiation Causes Brain Tumors and Should Be Classified as a Probable Human Carcinogen.** Morgan, L., et al. *International Journal of Oncology* 46:1865-1871 (2015). https://www.spandidos-publications.com/ijo/46/5/1865

6. **Mobile Phone Use and Brain Tumours in the CERENAT Case-Control Study.** Coureau, G., et al. *Occupational & Environmental Medicine* 71(7):514-22 (2014). http://www.ncbi.nlm.nih.gov/pubmed/24816517

7. **Use of Mobile Phones and Cordless Phones is Associated with Increased Risk for Glioma and Acoustic Neuroma.** Hardell, L., Carlberg, M. and Hansson Milk, K. *PathoPhysiology* 20(2):85-110 (2013). http://www.ncbi.nlm.nih.gov/pubmed/23261330
8. **Mobile Phones and Head Tumours: A Critical Analysis of Case-Control Epidemiological Studies.** Levis, A.G., et al. *Open Environmental Sciences* 6(1):1-12 (2012). https://benthamopen.com/contents/pdf/TOENVIRJ/TOENVIRJ-6-1.pdf

9. **On the Association Between Glioma, Wireless Phones, Heredity and Ionising Radiation.** Carlberg, M. and Hardell, L. *PathoPhysiology* 19(4):243-252 (2012). https://www.ncbi.nlm.nih.gov/pubmed/22939605

10. **Mobile Phones and Head Tumours. The Discrepancies in Cause-Effect Relationships in the Epidemiological Studies - How Do They Arise?** Levis, A.G., et al. *Environmental Health* 10:59 (2011). http://www.ncbi.nlm.nih.gov/pubmed/21679472

11. **Indications of Possible Brain Tumour Risk in Mobile-Phone Studies: Should We Be Concerned?** Cardis, E. and Sadetzki, S. *Occupational & Environmental Medicine* 68:169-171 (2011). http://oem.bmj.com/content/early/2010/12/15/oem.2010.061358

12. **Estimating the Risk of Brain Tumors from Cell Phone Use: Published Case-Control Studies.** Morgan, LL. *Pathophysiology* 16(2-3):137-147 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19356911

13. **Cell Phones and Brain Tumors: A Review Including the Long-Term Epidemiologic Data.** Khurana, V.G., et al. *Surgical Neurology* 72(3):205-14 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19328536

14. **Epidemiological Evidence for an Association Between Use of Wireless Phones and Tumor Diseases.** Hardell, L., Carlberg, M. and Hansson Mild, K. *PathoPhysiology* 16(2-3):113-122 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19268551

15. **Histopathological Examinations of Rat Brains After Long-Term Exposure to GSM-900 Mobile Phone Radiation.** Grafström, G., et al. *Brain Research Bulletin* 77(5):257-63 (2008). http://www.ncbi.nlm.nih.gov/pubmed/18782606

16. **Mobile Phone Use and the Risk of Acoustic Neuroma.** Lonn, S., et al. *Epidemiology* 15(6):653-659 (2004). https://www.ncbi.nlm.nih.gov/pubmed/15475713

IV. PAROTID GLAND TUMORS

1. **Does Cell Phone Use Increase the Chances of Parotid Gland Tumor Development? A Systematic Review and Meta-Analysis.** De Siqueira, EC., et al. *Journal of Oral Pathology and Medicine* 46(7) 480-483 (2017). https://www.ncbi.nlm.nih.gov/pubmed/27935126?dopt=Abstract

2. **Pooled Analysis of Case-Control Studies on Acoustic Neuroma Diagnosed 1997-2003 and 2007-2009 and Use of Mobile and Cordless Phones.** Hardell, L. and Carlberg, M. *International Journal of Oncology* 43(4):1036-1044 (2013). http://www.ncbi.nlm.nih.gov/pubmed/23877578

3. **Using the Hill Viewpoints from 1965 for Evaluating Strengths of Evidence of the Risk for Brain Tumors Associated with use of Mobile and Cordless Phones.** Hardell, L. and Carlberg, M. *Reviews on Environmental Health* 28(2-3):97-106 (2013). http://www.ncbi.nlm.nih.gov/pubmed/24192496

4. **Case-Control study of the Use of Mobile and Cordless Phones and the Risk for Malignant Melanoma in the Head and Neck Region.** Hardell, L., Carlberg, M., Hansson Mild, K. & Eriksson, M. *Pathophysiology* 18(4):325-333 (2011). http://www.sciencedirect.com/science/article/pii/S0928468011000320

5. **Correlation Between Cellular Phone Use and Epithelial Parotid Gland Malignancies.** Duan, Y., Zhang, HZ. And Bu, RF. *International Journal of Oral and Maxillofacial Surgery* 40(9):966-972 (2011). http://www.ncbi.nlm.nih.gov/pubmed/21474287

6. **Mobile Phones Use and Risk of Tumors: A Meta-Analysis.** Myung, SK., et al. *Journal of Clinical Oncology* 27(33):5565-72 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19826127

7. **Mobile Phone, Cordless Phones and the Risk for Brain Tumours.** Hardell, L. and Carlberg, M. *International Journal of Oncology* 35(1):5-17 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19513546

8. **Public Health Implications of Wireless Technologies.** Sage, C. and Carpenter, DO. *PathoPhysiology* 16(2-3):233-46 (2009). https://www.ncbi.nlm.nih.gov/pubmed/19285839

9. **Epidemiological Evidence for an Association Between use of Wireless Phones and Tumor Diseases.** Hardell, L., Carlberg, M and Hansson Mild, K. *PathoPhysiology* 16(2-3):113-122 (2009). http://www.sciencedirect.com/science/article/pii/S0928468009000091

10. **Cell Phone Use and Risk of Benign and Malignant Parotid Gland Tumors - A Nationwide Case-Control Study.** Sadetzki, S., et al. *American Journal of Epidemiology* 167(4):457-467 (2007). http://aje.oxfordjournals.org/content/167/4/457.abstract

V. OTHER MALIGNANCIES

1. **Tumor Promotion by Exposure to Radiofrequency Electromagnetic Fields Below Exposure Limits for Humans.** Lerchl, A., et al. *Biochemical and Biophysical Research Communications* 459(4):585-590 (2015). http://www.sciencedirect.com/science/article/pii/S0006291X15003988

2. **Swedish Review Strengthen Grounds for Concluding that Radiation from Cellular and Cordless Phones is a Probable Human Carcinogen.** Davis, DL., et al. *Pathophysiology* 20(2):123-129 (2013). http://www.ncbi.nlm.nih.gov/pubmed/23664410

3. **Multifocal Breast Cancer in Young Women with Prolonged Contact Between Their Breasts and Their Cellular Phones.** West, J., et al. *Case Reports in Medicine* (2013). http://www.hindawi.com/journals/crim/2013/354682/

4. **Epidemiological Evidence for an Association Between Use of Wireless Phones and Tumor Diseases.** Hardell, L., Carlberg, M. and Hansson Mild, K. *PathoPhysiology* 16(2-3):113-122 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19268551

5. **Study on Potential Effects of "902 MHz GSM-type Wireless Communication Signals" on DMBA-Induced Mammary Tumours in Sprague-Dawley Rats.** Hruby, R., et al. *Mutation Research* 649(1-2):34-44 (2008). http://www.ncbi.nlm.nih.gov/pubmed/17981079

VI. EFFECTS ON DNA

1. **Microwaves from Mobile Phones Inhibit 53BP1 Focus Formation in Human Stem Cells More Strongly Than in Differentiated Cells: Possible Mechanistic Link to Cancer Risk.** Markova, E., et al. *Environmental Health Perspectives* 118(3):394-399 (2010). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2854769/

2. **Radiofrequency Radiation and Gene/Protein Expression: A Review.** McNamee, JP. and Chauhan, V. *Radiation Research* 172(3):265-287 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19708776

3. **Evaluation of HSP70 Expression and DNA Damage in Cells of a Human Trophoblast Cell Line Exposed to 1.8GHz Amplitude-Modulated Radiofrequency Fields.** Valbonesi, P., et al. *Radiation Research* 169(3):270-279 (2008). http://www.ncbi.nlm.nih.gov/pubmed/18302482

4. **Gene and Protein Expression Following Exposure to Radiofrequency Fields from Mobile Phones.** Vanderstraeten, J. and Verschaeve, L. *Environmental Health Perspectives* 116(9):1131-5 (2008). https://www.ncbi.nlm.nih.gov/pubmed/18795152

5. **Nonthermal Effects of RadioFrequency-Field Exposure on Calcium Dynamics in Stem Cell-derived Neuronal Cells: Elucidation of Calcium Pathways.** Rao, V.S., et al. *Radiation Research* 169(3):319-329 (2008). https://www.ncbi.nlm.nih.gov/pubmed/18302487

6. **Gene Expression Changes in the Skin of Rats Induced by Prolonged 35 GHz Millimeter-Wave Exposure.** Millenbaugh, NJ., et al. *Radiation Research* 169(3):288-300 (2008). http://www.ncbi.nlm.nih.gov/pubmed/18302488

7. **DNA Damage in Molt-4 T-lymphoblastoid Cells Exposed to Cellular Telephone Radiofrequency Fields in Vitro.** Philips, J., et al. *Bioelectrochemistry and Bioenergetics* 45(1):103-110 (1998). http://www.sciencedirect.com/science/article/pii/S0302459898000749

VII. NEUROLOGICAL/COGNITIVE EFFECTS

1. **Mobile Phone distance From Head and Temperature Changes of Radio Frequency Waves on Brain Tissue.** Forouharmajd, F., Ebrahimi, H. and Pourabdian, S. *International Journal of Preventative Medicine* (2018). https://www.ncbi.nlm.nih.gov/pubmed/30123435

2. **A Prospective Cohort Study of Adolescents' Memory Performance and Individual Brain Dose of Microwave Radiation from Wireless Communication.** Foerster, M., et al. *Environmental Health Perspectives* 126(7) (2018). https://ehp.niehs.nih.gov/ehp2427/#tab3

3. **Electromagnetic Radiation 2450 MHz Exposure Causes Cognition Deficit with Mitochondrial Dysfunction and Activation of Intrinsic Pathway of Apoptosis in Rats.** Gupta, S.K., Mesharam, M.K., and Krishnamurthy, S. *Journal of Biosciences* 43(2) 263-276 (2018). https://www.ias.ac.in/article/fulltext/jbsc/043/02/0263-0276

4. **The Effect of Wi-Fi Electromagnetic Waves in Unimodal and Multimodal Object Recognition Tasks in Male Rats.** Hassanshahi, A., et al. *Neurological Sciences* 38(6):1069-1076 (2017). https://www.ncbi.nlm.nih.gov/pubmed/28332042

5. **Effects of Short and Long Term Electromagnetic Fields Exposure on the Human Hippocampus.** Deniz, O.G., et al. *Journal of Microscopy and Ultrastructure* 5(4):191-197 (2017). https://www.sciencedirect.com/science/article/pii/S2213879X17300524

6. **Effects of Long Term Exposure of 900-1800 MHz Radiation Emitted from 2G Mobile Phone on Mice Hippocampus – A Histomorphometric Study.** Mugunthan, N., et al. *Journal of Clinical and Diagnostic Research* 10(8):AF01-6 (2016). https://www.ncbi.nlm.nih.gov/pubmed/27656427?dopt=Abstract

7. **Effect of Mobile Phone Radiation on Pentylenetetrazole-Induced Seizure Threshold in Mice.** Kouchaki, E., et al. *Iranian Journal of Basic Medical Sciences* 19(7):800-3 (2016). https://www.ncbi.nlm.nih.gov/pubmed/27635206?dopt=Abstract

8. **Effects of 3 Hz and 60Hz Extremely Low Frequency Electromagnetic Fields on Anxiety-Like Behaviors, Memory Retention of Passive Avoidance and ElectroPhysiological Properties of Male Rats.** Rostami, A., et al. *Journal of Lasers in Medical Science* 7(2):120-125 (2016). http://www.ncbi.nlm.nih.gov/pubmed/27330708

9. **Short-Term Memory in Mice is Affected by Mobile Phone Radiation.** Ntzouni, MP., et al. *PathoPhysiology* 18(3):193-199 (2011). http://www.ncbi.nlm.nih.gov/pubmed/21112192

10. **Use of Mobile Phones and Changes in Cognitive Function in Adolescents.** Thomas, S., et al. *Occupational Environmental Medicine* 67(12):861-866 (2010). http://www.ncbi.nlm.nih.gov/pubmed/20798018

11. **Increased Blood-Brain Barrier Permeability in Mammalian Brain 7 Days After Exposure to the Radiation from a GSM-900 Mobile Phone.** Nittby, H., et al. *PathoPhysiology* 16(2-3):103-12 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19345073

12. **Effects of GSM 1800 MHz on Dendritic Development of Cultured Hippocampal Neurons.** Ning, W., et al. *Acta Pharmacoligica Sinica* 28(12):1873-1880 (2007). http://www.ncbi.nlm.nih.gov/pubmed/18031599

13. **Neurological Effects of Radiofrequency Electromagnetic Radiation.** Lai, H. *Advances in Electromagnetic Fields in Living Systems* 1:27-80 (1994). http://link.springer.com/chapter/10.1007%2F978-1-4615-2542-4_2#page-1

VIII. EFFECTS ON MALE FERTILITY

1. **Radiations and Male Fertility.** Kesari, K., Agarwal, A. and Henkel, R. *Reproductive Biology and Endocrinology* 16(118) (2018). https://rbej.biomedcentral.com/articles/10.1186/s12958-018-0431-1

2. **The Effect of 2.45 GHz Non-Ionizing Radiation on the Structure and Ultrastructure of The Testis in Juvenile Rats.** *Histology and Histopathology* (2018). http://www.hh.um.es/Articles-Proofs/18-049-manuscript.pdf

3. **Modulatory Effect of 900 MHz Radiation on Biochemical and Reproductive Parameters in Rats.** Narayanan, SN., et al. *Bratislava Medical Journal* 119(9):581-587 (2018). https://www.ncbi.nlm.nih.gov/pubmed/30226070

4. **Aloe Arborescens Juice Prevents EMF-Induced Oxidative Stress and Thus Protects from Pathophysiology in the Male Reproductive System In Vitro.** Solek, P., Majchrowics, L., and Koziorowski, M. *Environmental Research* 166:141-149 (2018). https://www.sciencedirect.com/science/article/pii/S0013935118301063?via=ihub

5. **The Effects of Radiofrequency Electromagnetic Radiation on Sperm Function.** Houston, BJ., et al. *Reproduction* (2016). https://rep.bioscientifica.com/view/journals/rep/152/6/R263.xml

6. **Male Fertility and its Association with Occupational and Mobile Phone Tower Hazards: An Analytical Study.** Al-Quzwini, O., et al. *Middle East Fertility Society Journal* (2016). https://www.sciencedirect.com/science/article/pii/S1110569016300127

7. **Sperm DNA Damage – The Effect of Stress and Everyday Life Factors.** Radwan, M., et al. *International Journal of Impotence Research* 28(4):148-154 (2016). https://www.ncbi.nlm.nih.gov/pubmed/27076112

8. **Electromagnetic Radiation at 900 MHz Induces Sperm Apoptosis through bcl-2, bax and caspase-3 Signaling Pathways in Rats.** Liu, Q., et al. *Journal of Reproductive Health* 12:65 (2015). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4523914/

9. **Habits of Cell Phone usage and Sperm Quality - Does It Warrant Attention?** Zilberlicht, A., et al. *Reproductive BioMedicine Online* 31(3):421-426 (2015). http://www.ncbi.nlm.nih.gov/pubmed/26206279

10. **Extremely Low frequency Magnetic Fields Induce Spermatogenic Germ Cell Apoptosis: Possible Mechanism.** Lee, S., et al. *BioMed Research International* (2014). https://www.hindawi.com/journals/bmri/2014/567183/

11. **In Vitro Effect of Cell Phone Radiation on Motility, DNA Fragmentation and Clusterin Gene Expression in Human Sperm.** Zalata, A., et al. *International Journal of Fertility and Sterility* 9(1):129-136 (2015). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4410031/

12. **Effect of Electromagnetic Field Exposure on the Reproductive System.** Gye, M. and Park, C. *Journal of Clinical and Experimental Reproductive Medicine* 39(1):1-19 (2012). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3341445/

13. **Effects of the Exposure of Mobile Phones on Male Reproduction: A Review of the Literature.** La Vignera, S., et al. *Journal of Andrology* 33(3):350-356 (2012). https://www.ncbi.nlm.nih.gov/pubmed/21799142

14. **Use of Laptop Computers Connected to Internet Trhough Wi-Fi Decreases Human Sperm Motility and Increases Sperm DNA Fragmentation.** Avendano, C., et al. *Fertility and Sterility* 97(1):39-45 (2012). https://www.fertstert.org/article/S0015-0282(11)02678-1/fulltext

15. **Exposure to Magnetic fields and the Risk of Poor Sperm Quality.** Li, D.K, et al. *Journal of Reproductive Toxicology* 29(1):86-92 (2010). http://www.ncbi.nlm.nih.gov/pubmed/19910156

16. **Mobile Phone Radiation Induces Reactive Oxygen Species Production and DNA Damage in Human Spermatozoa *In Vitro.*** De Luliis, G., et al. *PLoS ONE* 4(7) (2009). http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0006446

17. **Radio Frequency Electromagnetic Radiation (Rf-EMR) from GSM Mobile Phones Induces Oxidative Stress and Reduces Sperm Motility in Rats.** Mailankot, M., et al. *Clinics (San Paulo)* 64(6):561-5 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19578660

18. **Cell Phones: Modern Man's Nemesis?** Makker, K., et al. *Reproductive BioMedicine Online* 18(1):148-157 (2009). http://www.ncbi.nlm.nih.gov/pubmed/19146782

19. **Indicative SAR Levels Due to an Active Mobile Phone in a Front Trouser Pocket in Proximity to Common Metallic Objects.** Whittow, WG., et al. *IEEE Xplore* 149-152 (2008). http://ieeexplore.ieee.org/xpl/articleDetails.jsp?reload=true&arnumber=4516888

20. **Cell Phones and Male Infertility: Dissecting the Relationship.** Deepinder, F., et al. *Reproductive BioMedicine Online* 15(3):266-270 (2007). http://www.ncbi.nlm.nih.gov/pubmed/17854521

21. **Evaluation of the Effect of Using Mobile Phones on Male Fertility.** Wdowiak, A., et al. *Annals of Agricultural and Medicine* 14(1):169-172 (2007). http://www.ncbi.nlm.nih.gov/pubmed/17655195

22. **Effect of Cell Phone Usage on Semen Analysis in Men Attending Infertility Clinic: An Observational Study.** Agarwal, A., et al. Fertility and Sterility 89(1):124-128 (2008). http://www.ncbi.nlm.nih.gov/pubmed/17482179

IX. ELECTROMAGNETIC SENSITIVITY

1. **Functional Brain MRI in Patients Complaining of Electrohypersensitivity After Long Term Exposure to Electromagnectic Fields.** Heuser, G. and Heuser, S. *Reviews on Environmental Health* 32(3):291-299 (2017). https://www.ncbi.nlm.nih.gov/pubmed/28678737
2. **"Hot Nano Spots" as an Interpretation of So-Called Non-Thermal Biological Mobile Phone Effects.** Pfutzner, H. *Journal of Electromagnetic Analysis and Applications* 8(3):62-69 (2016). http://www.scirp.org/journal/PaperInformation.aspx?PaperID=65212

3. **Analysis of the Genotoxic Effects of Mobile Phone Radiation Using Buccal Micronucleus Assay: A Comparative Evaluation.** Banerjee, S., et al. *Journal of Clinical and Diagnostic Research* 10(3):ZC82-ZC85 (2016). https://www.ncbi.nlm.nih.gov/pubmed/27135009

4. **Tinnitus and Cell Phones: The Role of Electromagnetic Radiofrequency Radiation.** Medeiros, L. and Sanchez, T. *Brazilian Journal of Otorhinolaryngology* 82(1):97-104 (2016). http://www.sciencedirect.com/science/article/pii/S1808869415001639

5. **Microwave Frequency Electromagnetic Fields (EMFs) Produce Widespread Neuropsychiatric Effects Including Depression.** Pall, M. *Journal of Chemical Neuroanatomy* (2016). https://www.sciencedirect.com/science/article/pii/S0891061815000599?via%3Dihub

6. **Subjective Symptoms Related to GSM Radiation from Mobile Phone Base Stations: a Cross-Sectional Study.** Gomez-Perretta, C., et al. *BMJ Open* 3.12 (2013). http://bmjopen.bmj.com/content/3/12/e003836.full

7. **Green Communication- A Stipulation to Reduce Electromagnetic Hypersensitivity from Cellular Phones.** Kumar, N., et al. *Procedia Technology* 4:682-686 (2012). http://www.sciencedirect.com/science/article/pii/S2212017312003891

8. **Electromagnetic Hypersensitivity: Fact or Fiction?** Genius, S. and Lipp, C. *Science of the Total Environment* 414(1):103-112 (2012). http://www.sciencedirect.com/science/article/pii/S0048969711012733

9. **Neurobehavioral Effects Among Inhabitants Around Mobile Phone Base Stations.** Abdel-Rassoul, G., et al. *NeuroToxicology* 28(2):434-440 (2007). http://www.sciencedirect.com/science/article/pii/S0161813X06001835

10. **Establishing the Health Risks of Exposure to Radiofrequency Fields Requires Multidisciplinary Research.** Hietanen, M. *Scandinavian Journal of Work, the Environment, and Health* 32(3):169-170 (2006). http://www.sjweh.fi/show_abstract.php?abstract_id=994

11. **Hypersensitivity of Human Subjects to Environmental Electric and Magnetic Field Exposure: A Review of the Literature.** Levallois, P. *Environmental Health Perspectives* 110(4):613-8 (2002). https://ehp.niehs.nih.gov/doi/pdf/10.1289/ehp.02110s4613

12. **Electric Hypersensitivity and Neurophysiological Effects of Cellular Phones – Facts of Needless Anxiety.** Harma, M. Scandinavian Journal of Work, the Environment and Health 26(2):85-86 (2000). http://www.sjweh.fi/show_abstract.php?abstract_id=515

13. **Radiofrequency (RF) Sickness in the Lilienfeld Study: An Effect of Modulated Microwaves?** Liakouris, A. *Archives of Environmental Health* 236-238 (2018). https://www.tandfonline.com/doi/abs/10.1080/00039899809605701?journalCode=vzeh20

X. EFFECTS ON IMPLANTED MEDICAL DEVICES

1. **Ad Hoc Electromagnetic Compatibility Testing of Non-Implantable Medical Devices and Radio Frequency Identification.** Seidman S. and Guag, J. *Biomedical Engineering Online* 12:71 (2013). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3716957/

2. **Electromagnetic Interference of Pacemakers.** Lakshmanadoss, U. Chinnachamy, P and Daubert, J. *Intech* 229-252 (2011). http://cdn.intechopen.com/pdfs-wm/13783.pdf

3. **Interference Between Mobile Phones and Pacemakers: A Look Inside.** Censi, F., et al. *Annali Dell'Istituto Superiore di Sanità* 43(3):254-259 (2007). http://www.ncbi.nlm.nih.gov/pubmed/17938456

4. **Electromagnetic Interference on Pacemakers.** Erdogan, O. *Indian Pacing and Electrophysiology Journal* 2(3):74-78 (2002). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1564060/

5. **Electromagnetic Interference in Patients with Implanted Cardioverter-Defibrillators and Implantable Loop Recorders.** Sousa, M., et al. *Indian Pacing and Electrophysiology Journal* 2(3):79-84 (2002). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1564059/

6. **Radiofrequency Interference with Medical Devices. A Technical Information Statement.** *IEEE Engineering in Medicine and Biology Magazine* 17(3):111-4 (1998). http://www.ncbi.nlm.nih.gov/pubmed/9604711

7. **Cellular Telephones and Pacemakers: Urgent Call or Wrong Number?** Ellenbogen, KA. and Wood, MA. *Journal of the American College of Cardiology* 27(6):1478-9 (1996). http://www.ncbi.nlm.nih.gov/pubmed/8626961

XI. 5G EFFECTS

1. **Towards 5G Communication Systems: Are There Health Implications?** Ciaula, AD. *International Journal of Hygiene and Environmental Health* 367-375 (2018). https://www.sciencedirect.com/science/article/pii/S1438463917308143

2. **5G Wireless Telecommunications Expansion: Public Health and Environmental Implications.** Russell, C.L. *Environmental Research* 165:484-495 (2018). https://www.sciencedirect.com/science/article/pii/S0013935118300161

3. **The Human Skin As A Sub-THz Receiver – Does 5G Pose a Danger To It or Not?** Betzalel, N., Ishai, P.B., and Feldman, Y. *Environmental Research* 163:208-216 (2018). https://www.sciencedirect.com/science/article/pii/S0013935118300331?via%3Dihub

4. **The Modeling of the Absorbance of Sun-THz Radiation by Human Skin.** Betzalel, N., Feldman, Y., and Ishai, P.B. *IEEE Transactions on Terahertz Science and Technology* 7(5):521-528 (2017). https://ieeexplore.ieee.org/document/8016593/

5. **Human Exposure to RF Fields in 5G Downlink.** Nasim, I. and Kim, S. *Georgia Southern University* (2018). https://arxiv.org/pdf/1711.03683.pdf

XII. MISCELLANEOUS ARTICLES

1. **Commentary on The Utility of The National Toxicology Program Study on Cell Phone Radiofrequency Radiation Data for Assessing Human Health Risks Despite Unfounded Criticisms Aimed at Minimizing the Findings of Adverse Health Effects.** Melnick, R. *Environmental Research* 168:1-6 (2019). https://www.sciencedirect.com/science/article/pii/S0013935118304973?via%3Dihub

2. **Genotoxic and Carcinogenic Effects of Non-Ionizing Electromagnetic Fields.** Kocaman, A., et al. *Environmental Research* 163:71-79 (2018). https://www.sciencedirect.com/science/article/pii/S0013935118300343?via%3Dihub

3. **Non-Ionizing EMF Hazard in the 21st Century.** Koh, W.J., and Moochhala, S.M. *IEEE* (2018). https://ieeexplore.ieee.org/document/8393832/

4. **Thermal and Non-Thermal Health Effects of Low Intensity Non-Ionizing Radiation: An International Perspective.** Belpomme, D., et al. *Environmental Pollution* 242(A):643-658 (2018). https://www.sciencedirect.com/science/article/pii/S0269749118310157?via=ihub

5. **Comparison of Radiofrequency Electromagnetic Field Exposure Levels in Different Everyday Microenvironments in an International Context.** Sagar, S., et al. Environmental International 114:297-306 (2018). https://www.ncbi.nlm.nih.gov/pubmed/29529581

6. **World Health Organization, Radiofrequency Radiation and Health – A Hard Nut to Crack (Review).** Hardell, L. *International Journal of Oncology* 51:405-413 (2017). https://www.spandidos-publications.com/ijo/51/2/405

7. **Radiation from Wireless Technology Elevates Blood Glucose and Body Temperature in 40-Year-Old Type 1 Diabetic Male.** Kleiber, C. *Electromagnetic Biology and Medicine* 36:3 259-264 (2017). https://www.ncbi.nlm.nih.gov/pubmed/28524704

8. **Cardiovascular Disease: Time to Identify Emerging Environmental Risk Factors.** Bandara, P. & Weller, S. *European Journal of Preventative Cardiology* (2017). http://journals.sagepub.com/doi/abs/10.1177/2047487317734898?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed

9. **Effects of Exposure to 2100MHz GSM-like Radiofrequency Electromagnetic Field on Auditory System of Rats.** Celiker, M., et al. *Brazilian Journal of Otorhinolaryngology* (2017). https://www.ncbi.nlm.nih.gov/pubmed/27865708?dopt=Abstract

10. **An Investigation of the Effect of Extremely Low Frequency Pulsed Electromagnetic Fields on Human Electrocardiograms (ECGs).** Fang, Q., et al. *International Journal of Environmental Research and Public Health* 13(11) (2016). https://www.ncbi.nlm.nih.gov/pubmed/27886102

11. **Evaluation of the Protective Role of Vitamin C on the Metabolic and Enxymatic Activities of the Liver in the Male Rats After Exposure to 2.45 GHz of Wi-Fi Routers.** Shekoohi-Shooli, F., et al. *Journal of Biomedical Physics and Engineering* 6(3):157-164 (2016). https://www.ncbi.nlm.nih.gov/pubmed/27853723?dopt=Abstract

12. **Exposure of ELF-EMF and RF-EMF Increase the Rate of Glucose Transport and TCA Cycle in Budding Yeast.** Lin, K., et al. *Frontiers in Microbiology* (2016). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5005349/

13. **Awareness Campaign Against Cell Phone Radiation Hazard: Case Study Oman.** Osmen, W. and Saar, A. *Procedia - Social and Behavioral Sciences* 205(9):381-385 (2015). http://www.sciencedirect.com/science/article/pii/S1877042815050351

14. **Electromagnetic Energy Radiated from Mobile Phone Alters Electrocardiographic Records of Patients with Ischemic Heart Disease.** Alhusseiny, AH., et al. *Annals of Medical and Health Science Research* 2(2):146-151 (2012). https://www.semanticscholar.org/paper/Electromagnetic-Energy-Radiated-from-Mobile-Phone-Alhusseiny-Al-Nimer/30272ec2956c9000f6598f739579c1464f2891aa

15. **Effects of Radiofrequency Radiation on Human Ferritin: An *in vitro* Enzymun Assay.** Fattahi-asl, J., et al. *Journal of Medical Signals and Sensors* 2(4):235-240 (2012). https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3662108/

16. **Apoptosis is Induced by Radiofrequency Fields through the Caspase-Independent Mitochondrial Pathway in Cortical Neurons.** Joubert, V., et al. *Radiation Research* 169(1):38-45 (2008). https://www.ncbi.nlm.nih.gov/pubmed/18159956

17. **Source of Funding and Results of Studies of Health Effects of Mobile Phone Use: Systematic Review of Experimental Studies.** Huss, A., et al. *Environmental Health Perspectives* 115(1):1-4 (2007). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1797826/

18. **Epidemiology of Health Effects of Radiofrequency Exposure.** Ahlbom, A., et al. *Environmental Health Perspectives* 112(17):1741-1753 (2004). http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1253668/

19. **The Possible Role of Radiofrequency Radiation in the Development of Uveal Melanoma.** Stang, A., et al. *Journal of Epidemiology* 12(1):7-12 (2001). https://www.ncbi.nlm.nih.gov/pubmed/11138823

20. **Biological Effects of Amplitude-Modulated Radiofrequency Radiation.** Juutilainen, J. and Seze R. *Scandinavian Journal of Work, the Environment and Health* 24(2):245-254 (1998). https://www.ncbi.nlm.nih.gov/pubmed/9754855

Compilation prepared by Grassroots Environmental Education, Inc., 52 Main Street, Port Washington, New York 11050

Thank you for holding this hearing and for the opportunity to speak.

I'm Ken Gale. I produce and host an environmental radio show on WBAI-FM and am the Founder of the New York City Safe Energy Campaign. Special thanks to J K Canepa for presenting this to you.

Buildings are built to code and rarely better, with NYC architects like Chris Benedict as wonderful exceptions who should be consulted for this, so the way toward reducing energy use, and therefor our greenhouse gas emissions, is to improve building codes to take energy into account. This is a giant step in that direction, figuring out how to do that. Many building owners, managers and industry organizations don't realize the money savings involved in reducing energy use and have testified to that at prior hearings. You have your work cut out for you, getting through their denials.

I see that you aim to require building owners to submit annual building energy assessments. Great. But how will you enforce that? Building owners already owe the City Billions of dollars, billions with a B, for years of unpaid fines to the Environmental Control Board. Are you just setting up another requirement for them to ignore, with a penalty that they also ignore?

I see that there is a loophole for affordable housing. But with energy use being a higher percentage of what people in affordable housing pay, affordable housing should be the FIRST buildings to be made energy efficient.

Once you identify the steps buildings can take to reduce energy use, who will do the work? Those are working class jobs and the income of working class people is rarely enough to be able to afford living in New York City. Even the outer boroughs are going out of reach. That's before the proposed transit hike. That's despite all those new buildings that are mostly empty.

When Superstorm Sandy hit NYC and did all that damage, thousands of people from all over the U.S. came up here to offer their skills and get jobs. Most of them couldn't afford to live here, but *could* afford to live in New Jersey and Long Island and those areas recovered from Sandy MUCH faster than New York City. They have the skilled labor and we don't. They're not making the $80,000 threshold for what little affordable housing there is. It's the same for solar panel installers who don't own their own solar businesses.

Please take housing costs into account and DO something about them.

Lowering energy use means less methane burnt, less nuclear power bought, less excuses for pipelines. That in turn will mean cleaner air and water, which means healthier air and water. It also means renewable energy WILL be able to meet ALL energy needs. (As we speak, the Williams NESE fracked gas pipeline project into the waters off the Rockaways is under consideration. The gas distribution lines coming into our buildings leak methane, which is a greenhouse gas 120 times worse than carbon dioxide upon emission. And this project would lock us into another 40 years of buying and burning gas while the world moves on to better technologies.)

I thank you for taking a step in the right direction. When the air or water are clean, thank an environmentalist. If not, become one. 'Nuff Said! Thank you. nuffsaid@riseup.net

Good morning. I am Paula Speer, a resident of Bay Ridge, Brooklyn, and a volunteer with 350Brooklyn, an affiliate of 350.org dedicated to fighting climate change on the local level.

I understand that over two thirds of New York City's carbon emissions come from wasteful heating of buildings, mostly residential. I live in an old apartment block that puts out so much heat I have to keep my windows open through most of the heating season. Practically all my life I've been worried about global warming, and here I am helplessly sending wasted heat into the air.

With the city council's new legislation, my building will get with the program. I am a little nervous about what it will take to make my building more energy efficient. It has already made the conversion to cleaner heating oil. The next step is likely to be more rigorous. Will it mean a large co-op assessment? Will window replacement be messy and disruptive? Will the improvement result in higher property taxes?

Well, if it does, I will have to abide the plaster dust and do some budgeting. Climate change is an **emergency**, and we should all be more than ready to accept inconvenience and loss of money in order to stave off disaster.

I do hope that the financial hardship is lightened for those New Yorkers who barely get by. I know the council has worked hard to structure its requirements so as to avoid triggering "major capital improvement" ratings, and thus rent raises, on rent-controlled buildings, and I hope that the real estate industry operates in good faith to comply with the aims of this legislation. It is important that tenants in rent-controlled apartments not lose their foothold in our city.

I also respect that the logical starting target is larger buildings, of which I suspect mine is one, and that there may be inefficient smaller buildings which are at least temporarily let off the hook. This is OK. This is compromise. This is how we get things done.

This legislation will require some belt tightening, but it will create good jobs, too, in renovation and construction. Perhaps most important, it will be a concrete step in taming any fantasies that we live in some science-fiction, outer-planet space and can ignore climate change. We won't have an economy, we won't have social status, and our children won't have a life—if we don't have a planet.

When we reduce climate pollution, we will also have cleaner air for all New Yorkers, reducing asthma attacks and other lung conditions, especially for very young New Yorkers, whose lungs won't grow normally in polluted air. So we will have a cleaner, healthier city, with more good jobs, and truly be an example for the rest of the world with our fight against climate change.

There's been a lot of talk recently about a "Green New Deal." This time around, the new deal is going to be at the local level, the New York City Council leading the way with its bold vision. Let's do it.

Thank you.

Good morning/afternoon. My name is Jackie Weisberg. I am a photographer and a born and bred New Yorker. I am speaking also as a volunteer with 350Brooklyn, a local affiliate of 350.org. We are dedicated to fighting climate change on the local level.

New York City has an opportunity right now, to lead in the fight against climate change. The Intergovernmental Panel on Climate Change and a recent report by our federal government demonstrate that action on climate change must happen right now. However, we know action will not be taken on the national level. That's why we need action on every local level, including, and especially, here in New York City.

The bills that are being discussed can put New York City on a pathway to really be a global leader. This is the first and best legislation of its kind in the world. Our city skyline symbolizes so much to the rest of the world - The world has seen how far New York can go with our determination and grit. Wouldn't it be incredible for the city skyline to take on even more meaning! To show it can be clean and energy efficient! To truly be the model for the rest of the world on how to have a sustainable future in a big city environment.

If we don't pass strong legislation to reduce emissions from our dirty buildings, then our city skyline will indeed look very differently, as it will largely be under water. Cutting greenhouse gas pollution at the speed provided in the bills before the City Council are necessary according to the world's best science.

The highly regarded naturalist, David Attenborough, recently told leaders at UN climate summit that the fate of the world is in their hands and that the collapse of civilization and the natural world is on the horizon. My question to you, is, why would we not do everything we possibly can to prevent this?

Theo Miller
December [redacted], 2018

FOR THE RECORD

52 Bergen Street
Brooklyn, NY
11201
theodore.m.miller@yale.edu

While the bills being discussed this morning are well-intentioned, they overlook the most important factor in New York City's response to climate change: public will. The carbon reductions outlined in the IPCC 1.5C report will not be achieved without a willing and consenting public. The protests in France over the past couple of weeks should be a lesson that top-down regulations will not be enough on their own. New Yorkers must be given an opportunity to learn, workshop, and discuss climate change policies.

In order to fund climate education therefore, New York City should pass a "Percent for Climate" law. Similar to "Percent for Art", "Percent for Climate" would require that one percent of the budget for City-funded construction projects be spent on climate education. Just as the City has recognized for over 30 years that the art sector is essential for New Yorkers, it is time to do the same for climate education. It is my belief that New York has a truly unique opportunity to be at the forefront of the response to climate change. Yet time is running out, and running out fast. A scalable and sustainable plan for large-scale education and outreach needs to be funded, and "Percent for Climate" might be the best way to do it.

Thank you for your time.

FOR THE RECORD FOR THE RECORD

Intro 1253 Testimony
Nancy Romer
Peoples Climate Movement-NY, Leadership Team
Professional Staff Congress-CUNY, AFT #2334, Environmental Justice Working Group

One day, when my kids were little we visited my mom in her apartment in a large apartment house on E. 19th Street near Ave. M in Brooklyn. It was the dead of winter, snow all around, and we came bundled up in heavy jackets, boots, scarves and gloves. As soon as we got inside her apartment, my young sons stripped down to their underwear because it was unbearably hot in my mom's apartment. It always was hot in the winter. Mom wore a thin cotton nightgown and had all the windows open. Why, you might ask. Because the heat was blasting in the middle of the winter, even though we tried our best to shut off the valves in the radiators. The apartment was spewing out heat as the building's boiler was spewing out carbon. The energy bills were enormous; the apartments were extremely uncomfortable and the atmosphere was becoming more and more toxic for human and planetary health. That's what the "Dirty Buildings" bill Intro 1253, is all about: requiring retrofitting of inefficient heating and cooling systems in the largest buildings in NYC in order to make them more energy efficient, lower energy costs, make the apartments and offices in those buildings more comfortable and less wasteful, keep the air in NYC healthier to breath and significantly lower green house gases in NYC.

Over 70% of all greenhouse gases emitted in NYC are from those large, inefficiently heated and cooled buildings. Retrofitting those buildings will help NYC achieve the goals of the Paris Climate Accords—doing our share of keeping global temperature increases to 1.5 C. This is one of many other changes that will both improve the lives of New Yorkers and make the planet livable for future generations of humans; without these changes, we cannot keep our promise of a decent life for our children, grandchildren, and generations ahead. We must aggressively fix this problem, in all its complexity, now.

One of the great features of the "Dirty Buildings" bill is its flexibility. It does not require a one-size-fits-all approach but rather allows building owners to make educated choices on cost-effective solutions that will pay for themselves after 10-15 years. It sets an overall standard for energy use and allows construction companies to develop a series of approaches to energy efficiency that landlords can choose. It also will require a large number of people to be hired and trained to do this work to retrofit the large buildings presently belching out carbon. While the exact data on how many workers will be needed for this enormous project are not quite in yet but we know there will be thousands of new jobs produced by this legislation. So this is a jobs bill as well as a climate change and public health bill. This legislation makes sure that there won't be any MCI rent hikes for rent controlled or rent regulated apartments so that the people in economic need won't have to bear yet another burden of rent increases.

So, creating new, good paying jobs, decreasing carbon emissions in the air, saving energy costs, making apartments and offices more comfortable, making the air in NYC safer to breathe and taking a significant leadership step on climate policy are the reasons this is an important advance for a city that hopes to be the leader of the world averting climate disaster.

The Peoples Climate Movement of NY is an organizing group engaging dozens of union, community and environmental organizations in NYC. Our member groups are active in a wide range of climate activist work, including advancing the Dirty Buildings bill. We know, of course, this is not a stand-alone policy. We know that many other climate policy solutions will have to be added to this achievement. We have many miles to go before we can congratulate ourselves on saving the planet for the humans, but let us now support and celebrate this important victory in addressing the 70% of carbon emissions in NYC that spew out of large buildings. City Council Members, please vote for Intro 1253, the "Dirty Buildings Bill" and lead one step closer to climate mitigation.

FOR THE RECORD

I have lived in NYC for all my 17 years and plan to live here for the rest of my life. However, if we continue emitting disgusting amounts of climate pollution into our atmosphere, I fear that my home will be uninhabitable not for some distant future generation, but for me. The already harmful air, filled with exhaust and toxins will become even more dangerous, increasing the likelihood of asthma and other lung conditions in our children.

While we cannot reverse the damage that has already be done, we can still slow it down. One of those ways is to pass the Dirty Buildings Bill. Passing this bill means putting a regulation on the source that produces 70% of the climate pollution in the city: buildings. That means cleaner air for my kids and for me. That also means that we will release less carbon dioxide into the atmosphere which will slow down some of the destruction that Climate Change will inflicted. Passing this Bill is not an option. It is a necessity if we want other people like me to feel safe to raise their kids in this incredible city.

Let's preserve our planet so we can preserve our futures.

Leila Henry

FOR THE RECORD

FOR THE REC...

My name is Adi Anker and I am a sophomore at Beacon High School. I am in the environmental club and we have been working hard to educate ourselves on the efforts one can take to help the planet. Council Member Costa Constantinides, with Speaker Johnson's support, is now introducing legislation to fight climate change, while creating good jobs and cleaning the air. This bill would require large buildings to upgrade to modern energy efficiency standards. It would cut climate pollution from large buildings by about 40% by 2030, with cuts in pollution starting in 2022. The bill would also make sure that large buildings reach over 80% pollution cuts by 2050. Climate pollution is extremely damaging to the earth and cutting it at that speed actually meets the levels the world's scientists at the UN said are indeed needed to keep the planet from burning up. Along with that it would keep New York City from going underwater. It even hits the levels of the Paris climate agreement. This is the first and best legislation of its kind in the world and it makes sense for New York city to lead because our city influences the actions of so many other cities across the world. If we don't act, the climate crisis will drown out New York City in upcoming decades. That is why we are asking the Council Member to co-sponsor this legislation and help pass it.

Can you ask the council member to do that?

Thank you.

FOR THE RECORD

FOR THE RECORD

Dirty Buildings Bill

Growing up in New York City, freezing winters mean noisy radiators and walking around my apartment in shorts with the windows wide open. Whether in my apartment building or walking through Times Square, I've experienced this excessive waste of energy first-hand, and it is unsustainable. But it is not unchangeable, technology allows us to do so much and there are so many affordable ways to cut building pollution in the long run. As a student who is aware of the grim future that climate change will subject the world to, doing nothing is not an option. We can no longer be reluctant on this issue, and New York City must lead this revolution of energy efficiency. In a city with so much financial inequality, those who are already struggling will be affected by climate change the most. It is our responsibility to push forward legislation like this to protect our fellow New Yorkers and our planet. Constantinides' bill will not only cut climate pollution, improve air quality, and enable convenient energy solutions for building owners, but it will also create thousands of jobs to allow all communities to get involved in tackling these issues. Individuals can only do so much on their own, to enact real change, legislation must be passed on a larger scale making sustainability affordable and ensuring New York City can commit to saving the planet.

Yasmine Porath

NYPH
NEW YORK
PASSIVE HOUSE

SUPPORTS

MEMORANDUM IN SUPPORT OF
Council Bill Intro 1253

New York Passive House (NYPH) is an organization of design, construction and other professionals for the promotion and advocacy of the international Passive House Standard for a healthy, comfortable, energy efficient and carbon neutral built environment.

POSITION:

NYPH strongly urges the New York City Council to sign the Council Bill Intro No 1253: A Local Law to amend the New York City Charter and the Administrative Code of the City of New York, in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2050.

STATEMENT OF SUPPORT:

New York Passive House (NYPH) professionals in the City and around the State are already implementing buildings with emissions limits of 2050 as outlined in 28-320.3. These emission limits are achieved today by applying Passive House technology which is a rigorous standard of building energy efficiency that has been producing ultra-low carbon buildings of all types for nearly three decades. Passive House buildings utilize the global standard of carbon accounting and accomplish net zero emissions buildings by integrating green energy sources.

NYPH strongly supports the formation of an Office of Building Energy Performance and the setting of building emissions intensity limits as outlined in this bill. We recommend the inclusion of covered buildings below 25,000 gross square feet into this bill. NYPH further encourages the committee a study to include emission limits from embodied energy in a future bill.

New York Passive House joins Chairman Constantinides and Committee Members in urging the City Council to sign this legislation into law.

FOR THE RECORD

TESTIMONY IN SUPPORT OF NYC CITY COUNCIL INT. NO. 1253

I. Jon Forster, Co-Chair, DC37 Climate Justice Committee, former DC37 Executive VP
   a. Also the former VP of Local 375 at DC37
   b. Represents the 1000s of Architects, Engineers and Scientists that work for NYC

II. We have been working with CW4A Coalition on this Legislation for 3 years, and

III. District Council 37 is very supportive of Intro 1253
   a. We want to applaud CM Costa Constantinides and the Speaker in taking this initiative
   b. This is a tremendous move to reduce GHG emissions in NYC
      i. We need to reduce emissions as aggressively and quickly as possible
      ii. Especially given our vulnerability to ever stronger storms and rising sea levels
   c. As buildings are responsible for some 70% of our emissions,
      i. Terribly important this is a mandate for both public & private sector buildings
      ii. Terribly important this is a NYC initiative - NYC is often seen as leading the way
         1. Both nationally and internationally

IV. As presented, this bill is very encouraging of the use of City employees for administering bill
   a. This is very important
   b. City of New York has a highly trained, highly skilled in-house work force
   c. Many of whom are trained and already working in clean energy technologies
   d. All of our climate change legislation should be so structured to create a win/win for NYC
      i. We should use our in-house City work force as much as possible
         1. And hire people locally into good, career tracked, union jobs
      ii. While the brick and mortar work is done is the private sector
         1. With good Project Labor Agreements

V. We do need to be very clear about the oversight and enforcement of this initiative
   a. As this is a mandate in the private sector, this is critical to its success, and
   b. We should again use the City workforce that is already trained in these areas

VI. With this in mind, we recommend two small changes to the bill:
   a. First, that the Director of the proposed Office of Building Energy Performance
      i. Be a licensed design professional – probably an architect or an engineer
      ii. Believe this level of expertise is critical to the proper functioning of this office
   b. Second, that public sector unions should be included in the Advisory Board composition
      i. Specifically this would be in Section 28-320.2.1
      ii. As public sector unions are critical to helping to make this legislation a success

VII. Thank you, and I appreciate the opportunity to present our position and our concerns

C-PACE ALLIANCE

Capital Providers
CleanFund

Counterpointe SRE

Inland Green Capital

PACE Loan Group

Petros PACE Finance

Twain Financial Partners

Law Firms
Bricker & Eckler

Chapman and Cutler

Hirschler Fleischer

Winston & Strawn

Accounting Firms
Novogradac & Company

Testimony in Support of Bill T2018-3294 To Create a Sustainable Energy Loan Program
Cliff Kellogg, Executive Director, C-PACE Alliance
December 4, 2018

Good morning. My name is Cliff Kellogg, and I am the Executive Director of C-PACE Alliance. We are a coalition of six of the largest capital providers of Commercial PACE financing, as well as leading law firms and an accounting firm, all of whom are experts in Commercial PACE transactions (www.c-pacealliance.com). C-PACE Alliance members invested hundreds of millions of dollars in C-PACE transactions in programs nationally.

The C-PACE Alliance strongly supports bill T2018-3294 that will create a New York City sustainable energy loan program similar to a C-PACE program. C-PACE programs enable commercial property owners to pay for energy efficiency upgrades and renewable energy systems via a voluntary assessment that is added to their property tax bill. This system overcomes many of the obstacles that can deter owners from making worthwhile energy improvements. Nationwide, more than 1,700 C-PACE transactions enables over $750 million in upgrades.

The City Council should pass bill T-2018-3294 because New York City's building stock includes older, inefficient structures that are overdue for energy improvements.

Finally, we would like to draw the Council's attention to four areas for improvement in revised bill language or in rulemaking:

1. Clarify that all unpaid assessments will be enforced in the same manner as unpaid taxes. This means that participate in the City's tax lien sale program AND that the City will not accept partial payments of a property's tax bill.

2. The Program Administrators' administrative fees should be kept low. Many successful programs operate with administration fees of 1 percent or less, with per-transaction caps. Annual servicing fees are justifiable only to cover the program' out-of-pocket expenses.

3. Obtaining mortgage holder consent for all C-PACE financing should be mandatory. Because unpaid assessments are senior in priority to a traditional mortgage in liquidation, obtaining lender's consent avoids problems from a mortgage holder saying it was unaware of the assessment. This requirement should be in the rules, if not in the bill itself, for all C-PACE financing.

4. C-PACE Alliance requests the deletion of §11-3004 that subordinates C-PACE assessments to all other liens and arising out of taxes and assessments, and other city charges and interest. Reducing energy consumption is a public benefit just like sewer and water charges. To make PACE "less than" other taxes undermines its reception in the capital markets. If New York City subordinates the C-PACE assessments to other charges, it decreases the likelihood of collecting assessments, raises the cost of capital, and reduces the number and scale of energy upgrades.

Thank you for the opportunity to support Bill T2018-3294. Our members look forward to funding energy improvements in New York City soon.

###

Association of Electrical Contractors, Inc.
36-36 33rd St. Suite 402, Long Island City, NY 11106
Phone: 718.752.0800 Fax: 718.752.0805 www.aecnyc.com

FOR THE RE

MEMORANDUM IN SUPPORT

TESTIMONY OF THE ASSOCIATION OF ELECTRICAL CONTRACTORS BEFORE THE COMMITTEE ON ENVIRONMENTAL PROTECTION

REGARDING INTRO. 1251-2018: IN RELATION TO A BUILDING EFFICIENCY GRADE;
INTRO. 1252-2018: IN RELATION TO ESTABLISHING A SUSTAINABLE ENERGY LOAN PROGRAM
INTRO. 1253-2018: IN RELATION TO THE COMMITMENT TO ACHIEVE CERTAIN REDUCTIONS IN GREENHOUSE GAS EMISSIONS BY 2050.

DECEMBER 4, 2018

The Association of Electrical Contractors is a member of Local 3 I.B.E.W and the National Electrical Contractors Association (NECA). We represent 53 Union Electrical Contractors who work throughout the five boroughs.

The AEC joins its management partners Local 3 I.B.E.W , NYECA and the AEC in support of Intros: 1251-2018, 1252-2018 and 1253-2012. These important bills collectively will make a significant impact in addressing the serious environmental, health and economic issues resulting from climate change.

Intro.1252-2018 will mandate that buildings 25,000 square feet or larger meet new standards on reducing greenhouse gas outputs. In many cases these buildings must be retrofitted with new energy efficient technology as well as meet new operating procedures. This bill will help New York City meet its ambitious goal of an 80% gas emissions reduction by 2050.

Climate change is not a hoax but a very real and serious threat to our environment. A recent report issued by 13 USA federal agencies (The Fourth National Climate Assessment) highlights the catastrophic consequences of climate change for the United States if significant steps are not taken to rein in global warming. The report warns of the devastating effects of a changing climate on the economy, health and environment. The report puts the cost to the United States economy of projected climate impact at $141 billion from health related deaths, $118 billion from sea levels rise and $32 billion from infrastructure damage by the end of the century.

The AEC proudly supports the efforts of the Committee on Environmental Protection, under the leadership of Chair Costa G. Constantinides, to enact sensible legislation to address the real and imminent threats posed by climate change.

Respectfully submitted on behalf of The Association of Electrical Contractors.

Sincerely,
Danielle Mannino
Executive Director, Association of Electrical Contractors

FOR THE

NEW YORK ELECTRICAL CONTRACTORS ASSOCIATION INC
FOUNDED 1892

MEMORANDUM IN SUPPORT

RE: ***INT. 1251-2018:*** **IN RELATION TO A BUILDING EFFICIENCY GRADE**
***INT. 1252-2018*: IN RELATION TO ESTABLISHING A SUSTAINABLE ENERGY LOAN PROGRAM**
***INT. 1253-2018*: IN RELATION TO THE COMMITMENT TO ACHIEVE CERTAIN REDUCTIONS IN GREENHOUSE GAS EMISSIONS BY 2025**

The New York Electrical Contractors Association (NYECA), the largest trade association of union electrical contractors in New York City, STRONGLY SUPPORTS Ints. 1251-2018, 1252-2018 and 1253-2018. These important bills collectively will make a significant impact in addressing the serious environmental, health and economic issues resulting from climate change.

Intro.1252-2018 will mandate that buildings 25,000 square feet or larger meet new standards on reducing greenhouse gas outputs. In many cases these buildings must be retrofitted with new energy efficient technology as well as meet new operating procedures. This bill will help New York City meet its ambitious goal of an 80% gas emissions reduction by 2050. NYECA contractors, in partnership with Local Union #3, IBEW, have the trained and skilled workforce necessary to complete all technology upgrades necessary to achieve this goal.

Climate change is a very real and serious threat to our environment. A recent report issued by 13 USA federal agencies (The Fourth National Climate Assessment) highlights the catastrophic consequences of climate change for the United States if significant steps are not taken to rein in global warming. The report warns of the devastating effects of a changing climate on the economy, health and environment. The report puts the cost to the United States economy of projected climate impact at $141 billion from health related deaths, $118 billion from sea levels rise and $32 billion from infrastructure damage by the end of the century.

NYECA, along with its industry partners, appreciate the efforts of the Committee on Environmental Protection, under the leadership of Chair Costa G. Constantinides, to enact sensible legislation to address the real and imminent threats posed by climate change.

For these reasons, NYECA strongly supports Int.1251-2018: in relation to a building efficiency grade, Int.1252-2018: in relation to establishing a sustainable energy loan program, and Int. 1253-2018; in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2025, and urges the New York City Council to pass these bills into law.

NYECA is the leading trade association of electrical contractors in New York City. We help build New York, serve our communities in times of crisis, provide opportunities for minority and women-owned businesses, and promote the highest standards of worker safety in the industry.

RESPECTFULLY SUBMITTED BY THE NEW YORK ELECTRICAL CONTRACTORS ASSOCIATION.

Edwin Lopez
Executive Secretary

JOINT INDUSTRY BOARD OF THE ELECTRICAL INDUSTRY
158-11 HARRY VAN ARSDALE JR. AVENUE • FLUSHING, N.Y. 11365
TEL: (718) 591-2000 • FAX: (718) 380-7741 • www.jibei.org

MEMORANDUM IN SUPPORT

TESTIMONY OF THE JOINT INDUSTRY BOARD OF THE

ELECTRICAL INDUSTRY

BEFORE THE COMMITTEE ON ENVIRONMENTAL PROTECTION

REGARDING INTRO. 1251-2018: IN RELATION TO A BUILDING EFFICIENCY GRADE;

INTRO. 1252-2018: IN RELATION TO ESTABLISHING A SUSTAINABLE ENERGY LOAN PROGRAM

INTRO. 1253-2018: IN RELATION TO THE COMMITMENT TO ACHIEVE CERTAIN REDUCTIONS IN GREENHOUSE GAS EMISSIONS BY 2050.

DECEMBER 4, 2018

Good morning Chairman Costa G. Constantinides and distinguished committee members. Thank you for the opportunity to testify at today's hearing. My name is Dr. Gerald Finkel; I am the Chairman of the Joint Industry Board of the Electrical Industry.

The Joint Industry Board of the Electrical Industry (JIB) is a labor- management organization founded in 1943 comprised of Local Union No. 3 of the International Brotherhood of Electrical Workers (I.B.E.W), the New York Chapter of the National Electrical Contractors Association (NYECA) and the Association of Electrical Contractors, Inc. (AEC). The JIB is the ERISA administrator for a family of multi-employer benefits plans serving Local Union No. 3 and its affiliated electrical contractors in the greater New York City area.

The JIB joins Local 3 I.B.E.W , NYECA and the AEC in support of Intros: 1251-2018, 1252-2018 and 1253-2012. These important bills collectively will make a significant impact in addressing the serious environmental, health and economic issues resulting from climate change.

Intro.1252-2018 will mandate that buildings 25,000 square feet or larger meet new standards on reducing greenhouse gas outputs. In many cases these buildings must be retrofitted with new energy efficient technology as well as meet new operating procedures. This bill will help New York City meet its ambitious goal of an 80% gas emissions reduction by 2050.

Climate change is not a hoax but a very real and serious threat to our environment. A recent report issued by 13 USA federal agencies (*The Fourth National Climate Assessment*) highlights the catastrophic consequences of climate change for the United States if significant steps are not taken to rein in global warming. The report warns of the devastating effects of a changing climate on the economy, health and environment. The report puts the cost to the United States economy of projected climate impact at $141 billion from health related deaths, $118 billion from sea levels rise and $32 billion from infrastructure damage by the end of the century.

The JIB applauds the efforts of the Committee on Environmental Protection, under the leadership of Chair Costa G. Constantinides, to enact sensible legislation to address the real and imminent threats posed by climate change.

Respectfully submitted on behalf of The Joint Industry Board of the Electrical Industry.

Sincerely,

Gerald Finkel

Dr. Gerald Finkel

Chairman, Joint Industry Board of the Electrical Industry

MONDAY, DECEMBER 3RD, 2018

FOR THE RECORD

FOR THE RECORD

CONTACT
contact@c40.org

SEE
C40.org
@c40cities
#Cities4Climate

Dear New York City Council Members,

Re:

This written testimony is submitted on behalf of the C40 Cities Climate Leadership Group (C40), an organization of mayors from the world's mega cities working together to tackling climate change. New York City, one of the founding members of C40, is an important leader globally in the fight against climate change. The policies and programs enacted in New York are used as models for other cities around the world, inspiring more ambitious and urgent action globally.

Most recently, the Intergovernmental Panel on Climate Change's Special Report on *"Global warming of 1.5 °C* and *Summary for Urban Policymakers* makes it crystal clear that the only "science-based" target is to limit global warming below 1.5°C:

- Limiting warming to 1.5 °C, rather than 2, will have a multitude of human development benefits. At 2 °C, food security, water stresses, poverty and human health will be significantly more negatively affected
- We are not on track: current commitments by national governments, if met, will deliver between 2.9 and 3.4 °C of average global warming by the end of the century. This is potentially devastating for human society
- To achieve 1.5 °C, relative to 2017 levels, global emissions must fall 75% by 2030, and reach net zero by 2043. **Realistically, that can only happen if major policy decisions are taken in the next four to five years.**

Each year we fail to meet the outlined emissions targets, the window to reach zero emissions on a pathway to 1.5°C is reduced by two years. Each year, the task becomes more difficult and more expensive.

The IPCC identifies six crucial areas of action in urban areas that will be key to unlocking a 1.5 °C future for us all: buildings, transport, low-carbon urban planning, green infrastructure, climate resilient land use, and sustainable water management.

The IPCC notes that new urban construction everywhere must consume near-zero energy by the 2020s. In the Global North, 5% of all buildings must be retrofitted every year from 2020.

The NYC leadership's decision to legislate a first-of-its-kind ambitious existing buildings energy/GHG reduction policy is a crucial ground-breaking initiative.

The GHG footprint for buildings – the energy used to power, heat and cool buildings – accounts for almost 70 percent of New York City emissions. Fossil fuels burned in buildings for heat and hot water alone account for 40 percent of total citywide emissions. Cutting fossil fuel use will also improve air quality, create opportunities for good jobs, and increase the comfort of New York City homes and workspaces, while moving the city towards its climate change goals.

New York City's leadership is to be applauded. At a time where the actions of Americas great cities is critical, New York has stepped forward with a significant and real step.

Sincerely,

David Miller

David Miller
Regional Director for North America and
Global Ambassador for Inclusive Climate Action
C40 Cities Climate Leadership Group

TESTIMONY OF STEPHAN EDEL, DIRECTOR, NEW YORK WORKING FAMILIES BEFORE THE NEW YORK CITY COUNCIL ENVIRONMENTAL PROTECTION COMMITTEE HEARING ON INTRODUCTION 1253-2018 COMMITMENT TO ACHIEVE CERTAIN REDUCTIONS IN GREENHOUSE GAS EMISSIONS BY 2050 AND INTRODUCTION 1252-2018 ESTABLISHING A SUSTAINABLE ENERGY LOAN PROGRAM .

DECEMBER 4, 2018

NEW YORK CITY, NEW YORK

Introduction

My name is Stephan Edel, and I am pleased to offer the following testimony on behalf of New York Working Families.

I commend NYC Council Member Constantinides, NYC Council Speaker Johnson, and the NYC Council Environmental Protection Committee for holding this hearing to give New Yorkers the opportunity to weigh in on this vital issue that will impact not only our lives but the lives of our children and grandchildren.

Working Families seeks to promote democracy and the health of our communities as well as combat inequality and climate change through advocacy, public education, coalition building, policy research, and building progressive power. We have worked on energy and environmental policy for the past decade, working with partners around the state on efforts like the passage of Green Jobs Green New York Act.

Testimony

Extreme weather is wreaking havoc on New York. We have witnessed the harm, human and economic, that worsening superstorms like Harvey, Maria, Irma, Sandy, Irene, and Lee have wrought across the country and right here in New York.

Air pollution exacerbates chronic health conditions, triggering asthma attacks and other health problems, such as heat exhaustion and heatstroke.

While climate change affects everyone, disadvantaged communities are often hardest hit and the last to see relief. Climate change is having a particularly devastating impact on New York's low-income residents, communities of color, immigrants, individuals with disabilities, and other vulnerable communities.

At the same time as we face the climate crisis we also face a growing housing crisis. Tens of thousands of New Yorkers are homeless, far more are housing insecure. Despite strong efforts from the City Government and Community Groups the quality and quantity of truly affordable housing shrinks every day.

Many New Yorkers are still suffering from the great recession and across the city we continue to face a lack of good family sustaining jobs.

Luckily this is not simply a threat we face but an opportunity to ensure a just transition to the new energy economy that will bring with it good jobs that our communities vitally need. In New York City the single largest part of that transition is improving and modernizing our buildings.

Here are some facts:

- A well-crafted mandate, such as the one contained in this bill, with adequate support programs can and will be the most important emissions reduction policy the city can enact. The mandate can have not just a major role in meeting our 2050 emissions goals in the future, but will save lives by immediately starting to reduce harmful pollution right here in our neighborhoods.
- Implementing the mandate and supportive programs, including but not limited to the Sustainable Energy Loan Program, can lead to short term benefits protecting New

Yorkers from local emissions and increasing heat, especially in heat islands, that are already leading to harm.

- Improving our local energy and building systems means improving housing and offices, and therefore positively impacting on our health, comfort, affordability, and resiliency.
- Rather than costing money in the long run, these are improvements that can be built into the capital cycle at modest cost while bringing down long term operating costs. Greater efficiency and cleaner energy can save consumers and owners money and make our energy system more resilient. Extreme weather damages our infrastructure, disrupts lives, and jeopardizes water and food supplies.

We support Intro 1253-2018 which enacts a commitment to achieve reductions in greenhouse gas emissions by 2050.

After nearly a decade of work and legislation on this topic, this bill has been crafted carefully based on years of input. This bill deftly balances the concerns and competing needs of aggressively addressing climate change, ensuring building owners can comply, and protecting housing affordability. From the beginning we have stated that a bill must actually meet our 8x50 goals, protect tenants, and create good jobs. This bill will do that.

- The bill takes an important step to establish one central office, the Office of Building Energy Performance, to oversee all building energy performance legislation and policies. And we are supportive of the creation of the advisory board that should include not only technical experts in building energy efficiency, but experts in housing affordability representing the community and able to ensure the bill's implementation follows through on its vital protections for tenants, and help to ensure everyone can participate effectively.
- We are very pleased the bill establishes strong building emissions intensity limits and a clear path to strong limits all the way through 2050. These emissions intensity limits have been calculated to establish a trajectory toward an 80% reduction in carbon emissions by 2050. If there are tweaks to the bill we strenuously encourage the committee only to consider amendments that maintain that trajectory.

- The bill importantly balances affordability with beginning to move rent-regulated buildings towards greater efficiency by expanding the audit and retro-commissioning laws to cover them down to 25,000 square feet. It is a vital first step that will not contribute lead directly to rent increases and units leaving rent-regulation. This is not the only approach possible, but it will move us towards needed emission reductions in the long run. No bill should or can advance that does not protect rent-regulation.
- If the committee considers amendments we stand ready to work with the other members of the 80x50 buildings partnership on including the alternative path that we collectively developed, or another approach that doesn't undermine housing affordability.
- Many programs in the past have not instituted sufficient penalties to ensure compliance.I encourage the Council to review this section to ensure that those who refuse to follow the rules are held accountable., For example, the Council should consider the impact of the bill's lack of minimum penalties, and the practical impact of the enforcement system on the staff of the Department of Buildings who are already overworked.
- The bill language regarding variances for hardship exemptions are vague and in some cases not defined in the bill. While allowing those who can't fully comply to meet an alternative green energy purchasing option or seek a variance makes sense - the details matter. Green power purchasing as an alternative should require Renewable Energy Credits we can all trust and we all benefit from specifically In-State generated credits eligible under New York's Clean Energy Standard. Green power purchases offer important flexibility, but importantly do not help make housing healthier, safer or more comfortable and likely will not improve air quality in New York City.
- Allowing a variance for those buildings where compliance would prevent "owners from earning a reasonable return" is so vague as to raise significant concern. With no clear standard for reasonable return, regulators are put in a near impossible position. I recommend eliminating this factor - the mandate only calls for necessary investments to meet our climate goals. This standard will be difficult to enforce meaningfully without exempting broad swaths of the real estate industry when they have a bad year.

We support Intro 1252-2018 which establishes a sustainable energy loan program.

Ensuring that buildings can access safe affordable capital to do implementation work is vital. This bill would establish a sustainable energy loan program for the purposes of providing certain building owners with funding for the installation of renewable energy systems or energy efficiency improvements. Based on our national conversations about sustainable energy finance, as well as nearly a decade of involvement with the development and implementation of the Green Jobs Green New York On-Bill Financing program and other energy efficiency programs, I would offer two suggestions to strengthen this bill:

- First, given the serious concerns regarding residential property assessed clean energy programs around the country, I would strongly urge that the council work with experts in consumer protection to ensure that all possible protections are in place even though currently state law appears to limit its application to commercial properties.
- Second, the City is correct to help facilitate clean energy projects including both renewable energy and energy efficiency, however to create a new program without ensuring that it takes consumer protection, labor standards, and community benefits into account is a missed opportunity. While this bill follows the broad State guidance and requires measures to be cost effective, it could go much further requiring the program administrator to work with community partners to ensure that the benefits are shared equitably and that no capital sources are predatory. It is well within the City's power to attach an array of standards to loans and financing incentives.

Conclusion

As we all continue to work towards the strongest possible package of legislation I would urge the Council to keep the strong long-term standards, and to continue to prioritize housing affordability.

I again wish to thank the many legislators, council staff members, and advocates for the hard work that got us here and opportunity to present this testimony. I close with urging the Environmental Protection Committee and council to pass this legislation.

FOR THE RECORD

TESTIMONY OF BLOOM ENERGY CORPORATION

Before The

NEW YORK CITY COUNCIL COMMITTEE ON ENVIRONMENTAL PROTECTION – BILL NO. Int. 1253-2018

Chairman Constantinides, Council Members, Good morning. My name is Charles Fox and I am Director of Regulatory Affairs and Business Development for Bloom Energy Corporation. On behalf of Bloom Energy I would like to offer some comments this morning with respect to proposed Bill No. 1253 which would establish greenhouse gas emissions limits for existing buildings in New York City.

Bloom Energy supports the Council's efforts to reduce greenhouse gas emissions from buildings as an important step to address the fact that over 40% of New York City's greenhouse gas emissions come from the building sector. We believe, however, that the bill as currently drafted may result in un-intended consequences. It appears that the proposed legislation would effectively prevent the deployment of customer-sited distributed generation and micro-grids in New York City because it would assign the emissions associated with distributed generation to customers *without accounting for the emission reductions those same projects achieve by displacing grid power.*

There is an accepted methodology for calculating the emission reductions achieved by distributed energy resources. This emissions impact evaluation uses the methodology published in the World Resources Institute's Guidelines for Quantifying GHG Reductions from grid-connected electricity projects.[1] The World Resources Institute approach to calculating the emissions associated with distributed generation is consistent with guidance provided by the US EPA in its eGRid technical support documentation.[2] New York University's Institute for Policy Integrity recently completed a report on the calculation of emission reductions from DERs with a specific focus on New York City and that report came to the same conclusion - that there is a widely accepted methodology for calculating the emission reductions associated with distributed on-site power generation and all of these authorities concur that the emissions associated with displaced grid power need to be taken into account.

Many customers in New York City are opting to make their energy supply cleaner and more reliable by using on-site distributed generation that emits fewer greenhouse gases, local criteria pollutants, and water than the marginal power plants that they are displacing. The proposed Bill 1253 creates

[1] https://www.wri.org/publication/guidelines-quantifying-ghg-reductions-grid-connected-electricity-projects
[2] https://www.epa.gov/energy/egrid-technical-support-document

uncertainty and the threat of penalties for customers that would otherwise opt to achieve significant emission reductions and increased resiliency via the deployment of clean on-site generation.

These concerns could be remedied by including in the bill text a provision which would clarify that *any emissions resulting from the installation of on-site power generation shall be evaluated by comparing the generator's emissions to the centralized generation that it is displacing*, namely the NYISO marginal generation unit(s) at the time of operation. We encourage the Council to review this issue and consider including this clarifying language in future versions of the proposed legislation.

Thank you very much for the opportunity to testify this morning.

BEST ENERGY POWER

20 WEST FAIRVIEW AVENUE
VALLEY STREAM, NY 11580
TEL: 212 730 2267/516 596 8811/201 377 1621 FAX: 646 225 7234
E-MAIL INFO@BESTENERGYPOWER.COM

NYC council public hearing, PACE financing 12/4/2018

My name is Ronnie Mandler and I am the president of Best Energy Power (BEP).

We at BEP have an excellent experience with PACE financing in Westchester and we believe it is the best thing that happened on the financing aspect of commercial solar.

BEP is known to have the biggest market share, in terms of the amount of commercial solar installations, in the 5-boroughs of NYC, and therefore have the highest exposure to potential customers interested acquiring a commercial solar system to offset their annual electric usage.
What I am trying to say her – we know what potential customers are looking for.

Like in any other business the question is risk and reward and accordingly the return of investment,

Also, any investment is evaluated by the alternative of the usage of money.

As for the risk and reward, we all know that risk and reward for commercial solar is a great reward, not only for the owner, but to the surrounding community - because of the great environmental benefits.

As for the ROI (return of investment), any potential building owner will question is the right alternative of usage of money, knowing the return of investment is good.

That is where PACE financing comes in, with a long term of financing up to 20 years without tying any liquid assets for such financing.
In other words, the solar benefits will actually pay for the financing with no money down out of pocket, and not tying any working capital.

Nothing can be better than that, and it is not brainer to go ahead and do it !!

We all heard about the PPA term, while a financing company offers a PPA financing to a customer with 2 major disadvantages compared to PACE:

1) Pushing to a very low cost of EPC, meaning the lowest cost of the system to max profit of the PPA financier, in other words not tier one equipment and workmanship.
2) The PPA financing does not give the owner the full benefit of the solar system.

PACE financing does not push for the lowest EPC, on the contrary, they want the customer to have the best solar system, and the customer gets the full benefit of the solar on day one.

PPA sells money while PACE is selling an easy way to finance solar

I believe it speaks for itself, if the NYC Council wants more solar, they should adopt the usage of PACE financing in NYC.

Thank you
Ronnie Mandler

December 4, 2018

Re: Testimony on Intro. 1253 – Local Law to amend New York City Charter and the Administrative Code of the City of New York in relation to the commitment to achieve certain reductions in greenhouse gas emissions by 2050.

Good morning, Chair Constantinides, and Committee members. My name is Anthony M. Montalto. I'm a licensed Professional Engineer and LEED Accredited Professional. I'm an associate partner at Jaros, Baum and Bolles, a consulting engineering firm, as well as the current President of the ASHRAE NY Chapter, on whose behalf I'm appearing today. I'm also joined by Charles Marino, Director of Energy Services at AKF Group and a longstanding board member of the ASHRAE NY Chapter. We're here on behalf of the local ASHRAE Chapter, which represents over 1,000 ASHRAE members.

ASHRAE (the American Society of Heating, Refrigerating and Air-Conditioning Engineers), founded in 1894, is a global society advancing human well-being through sustainable technology for the built environment. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry. Through research, standards writing, publishing, certification and continuing education, ASHRAE shapes tomorrow's built environment today. ASHRAE's mission is to advance the arts and sciences of heating, ventilating, air conditioning and refrigerating to serve humanity and promote a sustainable world. With more than 56,000 members from over 132 nations, ASHRAE is a diverse organization representing building system design and industrial process professionals around the world.

The NY Chapter consists of a wide-ranging group of engineers, designers, contractors, developers, sales representatives and other professionals involved with the built environment. It is our obligation to represent these various stakeholders. The ASHRAE NY Chapter supports the goal of Intro. 1253 and applauds the City Council for setting aggressive emission limits to greatly reduce greenhouse gas emissions by 2050. But we have concerns about the bill in its current form.

Section 28-320.3 of the proposed bill identifies the building CO_2 emission limits. The limits are categorized based on occupancy group as indicated in the NYC Building Codes. The use of occupancy groups for benchmarking CO_2 emissions is not appropriate. Buildings within each occupancy group differ drastically in terms of the energy usage and CO_2 emissions. The bill in its current state would provide the same limits of CO_2 emissions for a hospital and a warehouse. We recommend that the limitations of CO_2 be categorized based on a building's primary program use, and further recommend that the bill be revised to utilize the building classification system identified in Local Law 84. In addition, ASHRAE has a number of standards for the built environment that would be of help in this effort.

Thank you for this opportunity to testify. We appreciate all the efforts that you're taking to make this city a more sustainable place to live and work. We trust you'll take our concern into serious consideration, ensuring that the bill correctly targets emission limits for all building sectors and providing the bill its best opportunity to be an effective tool to drive carbon reductions in the built environment.

Anthony M. Montalto, PE, LEED AP
Associate Partner
(212) 530-9325
montaltoam@jbb.com

Good morning,

I'm Keith Kinch, cofounder of BlocPower. BlocPower is a clean tech start up backed by the venture capital firms who were early investors in Twitter, Facebook, and Lyft. BlocPower focuses on helping cities to become greener, healthier, and smarter. Through our platform, BlocPower connects building owners, utilities, governments, contractors, equipment providers, and lenders, allowing them to share a common platform to target, monitor, analyze and upgrade buildings. Thank you for this opportunity to comment today. Donnel and I were born and raised in New York City, Brooklyn to be borough specific, so this issue is very important to us on a professional as well as a personal level.

I open by simply stating BlocPower supports this bill. Legislation such as Intro 1253 brings the city one step closer to reaching the target goal reduction on emissions by 2050. Focusing on smaller buildings across the city, that are the biggest contributors to our carbon footprint per square foot is indeed a huge step forward.There are technical details in the bill that we would like to work with council to address, and to ensure the inclusion of low income New Yorkers in the transition to a carbon-free future in New York City. The first of the technical details is air quality.

In establishing greenhouse gas emission limits in existing buildings, this bill should aim to make air quality a priority. Data shows that residents living in low to moderate income communities have disproportionately high rates of asthma and asthma hospitalizations, emergency room visits, and missed school and work days. It is believed that poor housing conditions, exacerbated by poverty, contribute to the high rates of asthma and associated hospitalizations. I believe we have unique opportunity to make a tangible impact on this issue. The public health benefits would be felt immediately.

The transition to cleaner and efficient energy systems, with a focus on air quality, in more buildings across the city would lead to the reduction of air pollution from traditional pollutants such as particulate matter, and ozone. These pollutants are associated with asthma attacks, hospital visits, and medical expenses. Healthier buildings correlate to healthier children. That intern means children are spending less time in emergency rooms, parents are not losing income for taking time off, and our already strained health system is given alleviation.

Second, we need to ensure that energy efficiency upgrades, of any kind, do not lead to permanent rent increases for tenants. Operators of affordable housing portfolios, or your typical "mom and pop" building owners managing one to three properties that have been passed down from generation to generation, have thin or no profit margins. BlocPower believes incentives, alternative forms of financing, as well as technical support must be made available for building owners. This is particularly vital in low to moderate income communities. Historically LMI communities struggle with access to capital, lack the knowledge around energy efficiency, and have lower conversion rates in completing retrofits.

BlocPower can speak directly to this as we currently serve as an implementation consultant to the city's Community Retrofit NYC program. Community Retrofit NYC provides free educational, engineering, financial, and construction management advisory services to building owners, building operators, and community residents to help simplify the energy and water efficiency retrofit process. Through this program BlocPower works in partnership with Con Edison and National Grid to connect building owners to incentives, as well as refer building owners to Housing Preservation and Development (HPD) in need of financing. The average building size in the program is 25,000 to 50,000 square feet.

This approach of utilizing incentives and providing technical guidance yields higher conversion rates in completing energy upgrades in existing buildings.

Finally, BlocPower would like to see the development of an efficiency and environmental trading program. The program would allow building owners to buy energy savings from upgrades in other buildings. The new Office of Building Energy Performance, established through this bill, could oversee such a program. BlocPower lends its expertise to the council to strategize, develop, and implement this recommendation as well as the others mentioned today.

I thank the council for their passion, and leadership on this very important issue. As native New Yorkers, we are very proud of this city for taking a first in the nation stand and showing global leadership on this issue. BlocPower looks forward to working diligently with everyone here today.

Thank you.

Summary of Int # 1252

City Council Bill T2018-3294 – Establishing a sustainable energy loan program

Testimony of Genevieve Sherman, Head of New Markets and Partnerships at Greenworks Lending
December 4, 2018

New York City Councilmember Constantinides, Speaker Johnson, and members of the New York City Council, I serve as the Head of New Markets and Partnerships at Greenworks Lending, one of the largest Commercial PACE (C-PACE) capital providers in the country. We are active nationally and based in Darien, CT with offices in Maryland and California. Over our 4-year history, we have helped hundreds of businesses and non-profits improve their facility energy performance and in the process, strengthen their underlying financial position. I am here today to express our support for City Council Bill T2018-3294 establishing a sustainable energy loan program.

I want to recognize the hard work of the Mayor's Office of Sustainability, as well as the NYC Energy Efficiency Corporation in developing this bill. Our firm's origins were in the public sector where my colleagues and I designed and managed the Connecticut Green Bank's C-PACE program from 2012-2016. We understand more than most the important role the public sector plays in establishing and managing the public-private partnership that underpins C-PACE.

We have seen firsthand the value C-PACE programs can bring to cities. C-PACE enables commercial, industrial, and multifamily real estate property owners to overcome the steep, upfront costs for water and energy efficiency improvements by utilizing private sector financing for up to 100% of the capital improvements. This is done through a voluntary contractual C-PACE property assessment secured by a senior lien on the property. Businesses will save more on their monthly utility bills than the costs of the financed improvements. The program will cost the taxpayers nothing while reducing the cost of doing business, improving property values, stimulating the local economy, reducing greenhouse gas emissions, and creating local contracting jobs. The ordinance we are discussing today is one of those rare instances where everyone is a winner.

Our company, Greenworks Lending, is tremendously excited about the opportunity we see in New York City for C-PACE financing.

The commitment the City has made to sustainability, coupled with higher than average energy prices and an aging building sector, positions the City well for a successful program. C-PACE, quite simply, becomes an important arrow in the quiver of the City's efforts to promote sustainability and decrease energy consumption among its building stock.

We encourage the Council to vote favorably on T2018-3294 and begin the process to establish a NYC C-PACE Program.

FOR THE RECORD FOR THE RECORD

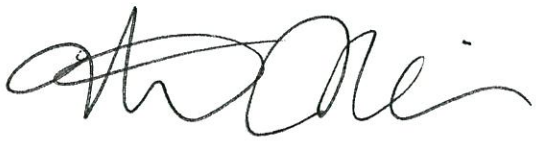
December 4, 2018
Testimony to City Council, Committee on Environmental Protection,
In support of Commitment to Achieve Reductions in GHG Emissions by 2050

I'm the editor of the project newyork.thecityatlas.org, about the future of New York City; we're based at the Institute for Sustainable Cities at Hunter College, and William Solecki, co-chair of the City's climate panel, is one of our advisors. Today I speak on my own behalf and do not speak for the Institute or for the City Atlas project.

The building efficiency goals described today are admirable, but are only part of what the city needs. Equally needed is a plan to rapidly educate the public at large about the implications of the IPCC 1.5C report, which calls for sweeping changes in our lifestyles and in our economy, including deep changes to many ordinary functions of the city and to the cultural framework in which we live our lives. The public needs to think about this and ultimately choose, or give consent to, the solutions themselves.

We each need to cut our emissions by half in the next ten years, and half again in the following ten years. High emitters are the most important people to reach. The 25,000 new Amazon jobs, affluent tech workers, will come with personal footprints as high or higher than 50 tons of CO2 per year. Much of that will be air travel; jet fuel is actually the largest single line in the city's emissions, same as Paris. The only way to make these cuts is through behavior change, followed by enormous investment and transformation of our energy system. The good news is that most New Yorkers are already energy efficient, and high income New Yorkers are well-educated and generally not resistant to the findings of science. They can change, we can change, and we can all lead together once the public dialogue begins. Building that open dialogue, with an honest appraisal of the situation, is the first step the city needs to take.

A recommended read is at this link:
https://www.green-alliance.org.uk/resources/Building_a_political_mandate_for_climate_action.pdf



Richard Reiss
Editor, City Atlas; Twitter: @cityatlas
Fellow, Institute for Sustainable Cities at Hunter College

CITY ATLAS
NEW YORK

Hunter College
East Building Suite 1215
695 Park Avenue
New York, NY, 10065

212.650.3456
thecityatlas.org

Association of Energy Engineers®

December 4, 2018

Dear Council Members:

I submit these comments regarding Introduction 1253 on behalf of the NY Chapter of the Association of Energy Engineers. The AEE is a nonprofit professional society, established in 1977, of over 18,000 members in more than 100 countries. AEE is dedicated to promoting the principles and practice of energy conservation and energy-efficient system design, and to foster action for Sustainable Development. Our Chapter has been in continuous operation since 1979, with a membership of professionals specialized in energy efficiency in facilities of all types. As such, we represent one of the *deepest* energy knowledge resources for the city.

AEE supports the goal of the proposed bills to effectuate major improvement across the building stock and significantly reduce energy use and associated GHG emissions. We applaud the proposal to create a permanent office, advisory body, working groups and various forms of owner assistance dedicated to this goal.

The GHG emissions reductions by upwards of 50%, as suggested by this legislation, are much greater than those achieved to date by Local Law 87, which we believe this Local Law should replace. Rather than expending capital and resources on the paperwork compliance LL-87 has become, property owners should focus on and fund actions that directly achieve the emissions levels called for here.

However, these emissions reductions will require significant investment from owners; investments that will take time to identify, design, procure, and install successfully & effectively - time that is not provided for by this bill. As energy professionals long active in this industry, we know that mountains don't move overnight and the practical realities involved with a city-wide upgrade of building stock are that it will take more than the 3 years currently allowed to be effective and long lasting. We caution that reduction quantities and maybe even timelines must be realistic and, as presently proposed, may not be.

3168 Mercer University Drive ▪ Atlanta, GA 30341 USA ▪ (770) 447-5083 ▪ (770) 446.3969 fax
Internet Home Page – www. aeecenter.org
NY Chapter Home Page – www. aeeny.org

We advise revising the bill to include such language that GHG levels can be off-set through the purchase of no more than 25% RECS.

We also note that since few A/E firms have the requisite energy expertise, this legislation will require substantial professional development training and, like LL87, should require a credentialed energy expert, such as a Certified Energy Manager (CEM), to certify building emissions compliance reports.

We highly caution against the proposed Variance mechanism as we believe such variances will elicit an outpouring of special pleading, the require voluminous documentation and time consuming reviews and ultimately leading to complaints about favoritism and corruption. Rent regulation properties do require special consideration, but complete "affordance" will exclude a significant building population from the regulation. A mandate should be included to develop a specific solution for this segment within a year after passage of the legislation.

With respect to Intro 1251 (Energy Grading), we question the proposed adjustments and instead suggest expanding the "C" score from 35 to 70, moving the "B" range from 70 to 85, and the "A" range 85 and above. This more closely matches Portfolio Manager and provides owners with a reasonable chance to improve their building energy grade, especially those at the lower end of the scale (higher energy users), where improvement is critical for city-wide progress. Numerous case studies demonstrate that opportunity for improvement and positive feedback results in greater change. As currently written, those buried at the low end of the proposed D threshold of "55", they may just see no hope of getting to a better grade and not try to improve.

Our Board of Directors has a series of more detailed comments, including on Introductions 1251 and 1252, that we will express in our full written submission. We appreciate the opportunity to express to you today our most salient concerns.

Respectfully,

Fredric Goldner, C.E.M.

NY-AEE Chapter Board Member
Past International President, AEE

3168 Mercer University Drive • Atlanta, GA 30341 USA • (770) 447-5083 • (770) 446.3969 fax
Internet Home Page – www. aeecenter.org
NY Chapter Home Page – www. aeeny.org

TESTIMONY IN SUPPORT OF NYC CITY COUNCIL INT. NO. 1253

I. Jon Forster, Co-Chair, DC37 Climate Justice Committee, former DC37 Executive VP
   a. Also the former VP of Local 375 at DC37
   b. Represents the 1000s of Architects, Engineers and Scientists that work for NYC
II. We have been working with CW4A Coalition on this Legislation for 3 years, and
III. District Council 37 is very supportive of Intro 1253
   a. We want to applaud CM Costa Constantinides and the Speaker in taking this initiative
   b. This is a tremendous move to reduce GHG emissions in NYC
      i. We need to reduce emissions as aggressively and quickly as possible
      ii. Especially given our vulnerability to ever stronger storms and rising sea levels
   c. As buildings are responsible for some 70% of our emissions,
      i. Terribly important this is a mandate for both public & private sector buildings
      ii. Terribly important this is a NYC initiative - NYC is often seen as leading the way
         1. Both nationally and internationally
IV. As presented, this bill is very encouraging of the use of City employees for administering bill
   a. This is very important
   b. City of New York has a highly trained, highly skilled in-house work force
   c. Many of whom are trained and already working in clean energy technologies
   d. All of our climate change legislation should be so structured to create a win/win for NYC
      i. We should use our in-house City work force as much as possible
         1. And hire people locally into good, career tracked, union jobs
      ii. While the brick and mortar work is done is the private sector
         1. With good Project Labor Agreements
V. We do need to be very clear about the oversight and enforcement of this initiative
   a. As this is a mandate in the private sector, this is critical to its success, and
   b. We should again use the City workforce that is already trained in these areas
VI. With this in mind, we recommend two small changes to the bill:
   a. First, that the Director of the proposed Office of Building Energy Performance
      i. Be a licensed design professional – probably an architect or an engineer
      ii. Believe this level of expertise is critical to the proper functioning of this office
   b. Second, that public sector unions should be included in the Advisory Board composition
      i. Specifically this would be in Section 28-320.2.1
      ii. As public sector unions are critical to helping to make this legislation a success
VII. Thank you, and I appreciate the opportunity to present our position and our concerns

My name is Mary Krieger and I am speaking on behalf of Jewish Climate Action NYC at this hearing, to express our support for Councilman Constantanides's bill to require retrofits of residential buildings with 25 or more units. This legislation rises to the challenge of aiming to be the world's best standard to tackle this enormous source of climate pollution. The bill:

- **Cuts climate pollution by 40% by 2030 and over 80% by 2050 –** the bill requires large buildings over 25,000 square feet to stop wasting energy and achieve 40% cuts in climate pollution by 2030 by upgrading their energy efficiency. Energy efficiency standards would begin for the dirtiest buildings in 2022.

- **Creates Thousands of Good Jobs Yearly –**energy efficiency upgrades are hands-on work. Upgrades create jobs in everything from weather-stripping and lighting upgrades to improved insulation and upgraded building systems like HVAC and boilers. Creating these jobs is particularly important for low-income and communities of color.

- **Improves Air Quality –**buildings use fossil fuels, typically in their boiler, or through power plants that provide electricity, including the cities large gas plants. By reducing energy use, this legislation will reduce local air pollution from buildings and power plants, protecting our lungs from asthma, emphysema and other health conditions.

COGGAN + CRAWFORD
ARCHITECTURE + DESIGN
64 WEST 9th STREET #3A BROOKLYN NEW YORK 11231
917 279 6234 studio@coggancrawford.com

04 December 2018

Council Member Costa Constantinides
250 Broadway, Suite 1778
New York, NY 10007

Re: Support of Int 1253-2018, reductions in greenhouse gas emissions by 2050

Dear Council Member,
I am a registered architect in the State of New York, a LEED Accredited Professional, Certified Passive House Designer. I am a member of the AIA New York Chapter Committee on the Environment, and a member of the Policy Subcommittee. I teach design and building technology at Pratt.

I support the bill.

I applaud the overall reduction in CO2 emissions of 80% by 2050, in line with the Mayor's office goals.

The method of accounting in terms of CO2 equivalent is how we should be accounting, and taking in not just the emissions on the site, but all emissions from the source of the energy to its use on site. The difficulty is that this is a means of accounting unfamiliar to most professionals. Thus sections § 28-320.5 Assistance and § 28-320.6 Outreach and education are critical components to ensuring that this is understood. Tools for conversion will have to be developed, and utility reporting requirements will have to be examined and possibly altered to assist in reporting.

New buildings coming on line in 2022 and existing buildings should be treated differently. New buildings today could conceivably meet the 2050 goals now. An building existing in 2022 will have a harder time meeting goals, especially since it will require significant capital improvements, thus there should be a different compliance time curve with the same end goal.

Buildings, even in the same occupancy group, are not used the same. Some buildings have denser occupancies, and are operated for longer hours than others. The administering agency must come up with a metric to regularize use intensity based on occupant hours for some use groups.

Thank you,

Caleb Crawford, RA, LEED AP BD+C, CPHD

MBB

3 December 2018

To the New York City Council:

I am a practicing architect at Murphy, Burnham & Buttrick, a member of the American Institute of Architects New York Chapter, also known as AIA New York, and a longtime resident of New York City and am pleased to offer my endorsement of the Retrofitting Legislation Int. 1253 brought forward by Council Member Constantinides. The need to respond to climate change is beyond urgent and this bill has the potential to be a first step toward meeting the challenges it poses. I would like to thank Council Member Constantinides for his work on this legislation and for the opportunity to offer comments today. While I applaud the initiative behind this bill and recognize that it is driven by an earnest desire to reduce carbon emissions in our city, there are a number of areas that I feel could be improved upon.

This legislation sets an emissions cap for all existing buildings over 25,000 square feet of a given occupancy group. While at first glance, this appears to be an equitable means to establish a standard, it groups together buildings with a wide array of ages, conditions, and rates of occupancy. This means that a 50-year-old building in poor condition is held to the same standard as a 2-year old building with a state-of-the-art mechanical system. In the case of the former, the improvements required to meet the energy target could represent a substantial cost – possibly much greater than any fines imposed for non-compliance. In the worst-case scenario, building owners might even see as the new cost of business and delay necessary improvements indefinitely.

As an alternative, the 80x50 Buildings Partnership has proposed a graduated energy target model that would require a given building to improve in relation to its own current performance. This would help reduce the risk of overburdening some buildings and would lead to a more manageable schedule for improvements. I would urge the Council to consider this as a more varied and flexible path to compliance as I believe that it will ultimately be more effective.

I would also recommend against the use of a carbon-based metric for the bill. While measuring building efficiency in equivalent tons of CO2 emitted is certainly in keeping with the intent behind the legislation, this is not a unit of measurement that is commonly used by design professionals. It adds an additional set of conversions and interpretations on top of the more generally accepted measurements of Energy Use Intensity. I feel that employing terminology standard to the industry will make for much easier adoption and implementation. In closing I would like to reiterate my support for Int. 1253.

Sincerely,

John M. Mealy, AIA

Murphy Burnham & Buttrick Architects 48 West 37th Street, New York, New York 10018 t 212.768.7676

Zakrzewski + Hyde Architects

SUPPORT LETTER FOR INTRO 1253

My name is Stas Zakrzewski, I am a member of the American Institute of Architects, a Certified Passive House Designer and Vice President of New York Passive House. I am here to day to express my support of Intro #1253 which seeks to limit New York City's Building Greenhouse Gas Emissions and to ensure this bill meets the Mayors goal of 80% reduction of Greenhouse Gas Emissions by 2050.

In New York City our Buildings contribute over 60 % of the total greenhouse gas emissions and we need to start building now to address this problem.

Currently, my firm is working on a 24 story, 65,000 SF multi-family Passive House rental building which is slated for completion in Fall 2018. I am pleased to report that this building will have slightly lower emissions than the 2050 goal and is testament that these goals are possible now.

We are also doing a passive house retrofit of an existing residential building in Brooklyn where we will also be meeting the proposed 2050 limits. I have included a diagram showing these two projects and their respective emission limits.

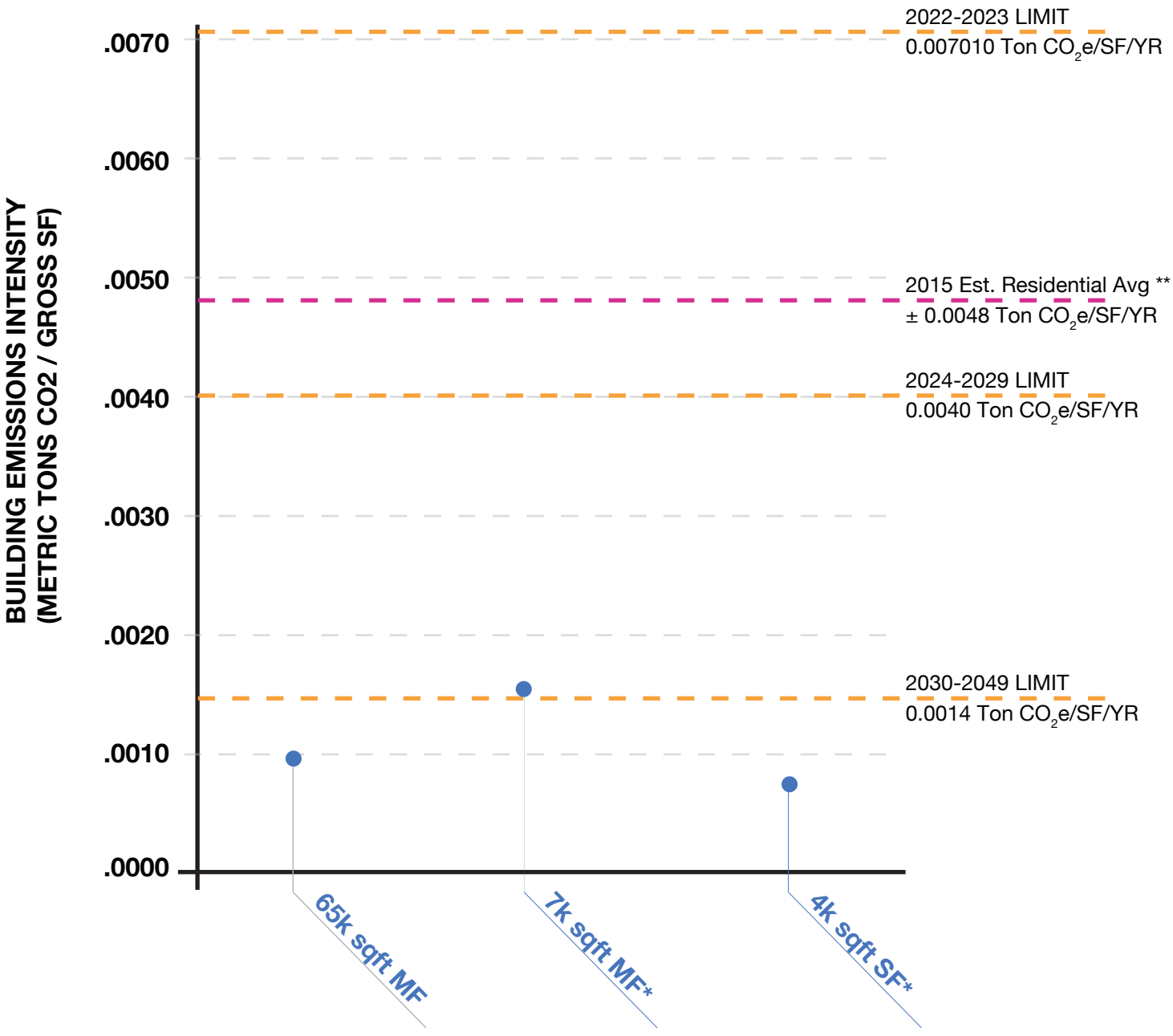
To help communicate how these limits can be achieved and to ensure that we meet the 80x50 target, I have the following additional comments:

- Provide easily accessible information as to how emissions are calculated.
- Consider having the working groups review a stricter limit for the initial years of the bill as the proposed 2023 Residential Occupancy emissions limit is comparable to the average emissions of residential buildings today. We don't want to lock in on to low a target.
- Consider having different limits for existing building stock versus new buildings - new buildings should have lower emissions limits that existing retrofits. And buildings with longer use patterns should have different limits.
- Rent regulated buildings should be included in some capacity in this bill.
- We also need to consider the embodied energy (or energy consumed in the production) of a building. Studies have shown that over the lifetime of a building 20% of the total emissions come from materials extraction, shipping and the construction process. With recent developments we are seeing new ways to significantly reduce our carbon and emissions footprint.

I would like to applaud Council Member Constantinides, the speaker (council Member Johnston) and Council Members Torres, Kallos, Rosenthal, Levin, Rivera, Koo Powers and levine for taking the necessary steps in seeking to reduce Greenhouse gas emissions in our city.

Zakrzewski + Hyde Architects

BUILDING EMISSION LIMITS COMPARISON
OCCUPANCY GROUP R



Reference NYC Buildings
(In construction or design, ZH Architects)

* Retrofit
MF = Multifamily
SF = Singlefamily

** Residential Average based on data from Mayor's office of sustainability, inventory of New York City's Greenhouse Gas Emissions, April 2017 and NYC MAP Pluto data on residential square footage totals for NYC

Max G. Wolf AIA PE CPHD LEED AP
52 Saint Nicholas Place, #5
New York, NY 10031
917.880.0511

December 3, 2018

New York City Council
250 Broadway
New York, NY 10007

Re: Support for Int. No. 1253, Reductions in Greenhouse Gas Emissions by 2050

To the New York City Council,

As a registered architect and structural engineer in New York State, I wish to express my strong support for Int. 1253 requiring the reduction of New York City GHG emissions by eighty percent by 2050. I am a member of the American Institute of Architects New York Chapter (AIA New York), and serve on the AIA NY Committee on the Environment.

For this bill to be broadly adopted, I believe the new Office of Building Energy Performance will need to refine how carbon intensity limits within each use group are calculated, with the suggested goal of compliance based on average emissions of all the buildings within each group. The diversity of building conditions, construction types, use intensities and other factors will probably require such accommodation for successful implementation.

With respect to the rates of carbon reduction set forth in the bill, I suggest the most rapid carbon reductions be required in the near term (before 2030-35) rather than the mid to long term (after 2040). The further into the future reductions are projected, the more risk accrues that some unforeseen circumstances will arise and prevent their achievement. In dealing with the potentially catastrophic, irreversible damage posed by climate change, the Precautionary Principle requires such a conservative approach. Following it can provide an increasing margin of safety between 2020 and 2040, so that final 80x50 targets have the highest probability of being met. Please see comments in Fig. 1 below for reference. Leaving some of the steepest reductions to 2040-2050 with little reduction in the building sector from 2030-2040 adds needless risk and insufficient reaction time for course correction.

To realize 1253, rapid deployment of a loan program to make deep carbon reductions financially feasible will need to take place, and so I strongly support Int. 1252 - New York City Sustainable Energy Loan Program. In parallel to this, 1253 should include amendments to Local Law 87 to allow buildings to develop capital plans for deep carbon reductions rather than audits. It will also be critical to include a training program for design professionals to teach them the essentials of developing capital plans and design strategies for the deep reductions required.

With respect to a few details in 1253, the following are recommended:

1. Clarification of the sudden drop in carbon intensity after the first two years. Some kind of graph for carbon intensity reduction would help convey a gradual, achievable transition.

2. Definition of fossil fuel: Suggest adding oil to the list, and striking of '… formed in the geological past…' since this phrase leaves open oil, gas and other biofuels manufactured from farmed algae and other plants in the present, which occurs on an increasing scale.

I wish to thank Council Member Constantinides and all other Council Members for championing this bill, including the incorporation of a number of AIA NY's previous comments. We look forward to further collaboration to make this bill the success it needs to be for our generation, and the many to come.

Sincerely yours,

Max G. Wolf AIA PE CPHD LEED AP

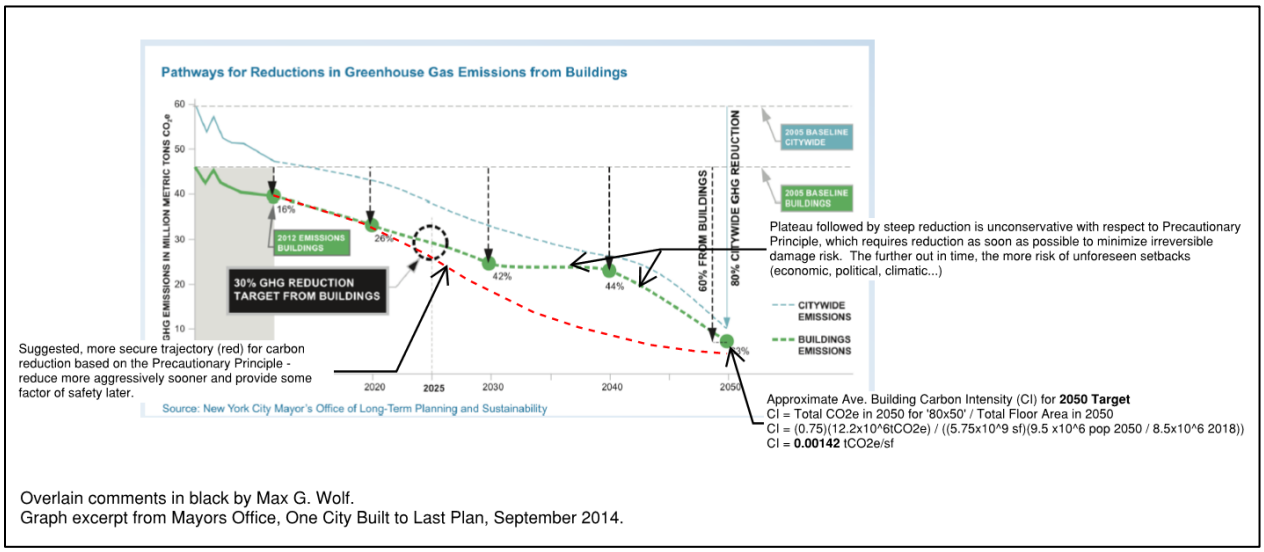


Figure 1. Suggested carbon reduction path (red).

AIA New York

December 3, 2018

AIA New York Statement of Support for Retrofitting Legislation

AIA New York strongly advocates for a more sustainable and equitable built environment. Through programming and by supporting various pieces of legislation, we have encouraged our 5,600 members to design in a more environmentally conscious manner.

Despite advances in sustainable design over the years, far more can be done to make our cities green. Crucially, we need to support efforts to retrofit existing buildings. While sustainable design for new buildings is increasingly widespread, far more New Yorkers live and work in older buildings, most of which have not been retrofitted according to the latest technologies and design practices.

If we do not retrofit our existing building stock en masse, we jeopardize the health and safety of ourselves and future generations. Right now, around 70% of New York's carbon emissions are generated by buildings. In order to tackle issues around climate change, resiliency, and air quality, we need to retrofit our existing building stock.

Furthermore, continuing to overlook the retrofitting of existing structures may lead to greater inequity in our built environment. It should not be a luxury to live or work in a well-insulated building, though in New York City this is often the case. Those with sustainably designed apartments and offices often pay less in energy bills, which further exacerbates financial divides. If we do not address this issue now, our city will increasingly be divided between those who can afford to live and work with all the benefits of sustainable design, and the less fortunate who live and work in deteriorating buildings.

For these reasons, we applaud Council Member Costa Constantinides' pieces of legislation, Int. 1252 and Int. 1253, which require existing buildings over 25,000 square feet to meet energy efficiency targets. For years, market forces and government incentives have led to slow but steady increases in retrofitting. Unfortunately, we do not have time for a process that does not require immediate improvements. We need the City to require that the bulk of our large building stock start retrofitting as soon as possible.

These pieces of legislation have the potential to significantly improve the daily lives of millions of New Yorkers, while also spurring the growth of the green sector. New Yorkers deserve to live and work in better conditions, and for that reason we ask the City Council to pass, and the Mayor sign, Int. 1252 and Int. 1253.

Sincerely,

Gerard F. X. Geier II, FAIA, FIIDA, LEED AP
President

Benjamin Prosky, Assoc. AIA
Executive Director

The American Institute of Architects

AIA New York
536 LaGuardia Place
New York, NY 10012

T (212) 683 0023
F (212) 696 5022
www.aiany.org

Dr. Marshall Cox

CEO, Radiator Labs

Testimony regarding T2018-3293 & T2018-3294

T2018-3293

Commitment to achieve certain reductions in greenhouse gas emissions by 2050

A critical aspect of any effort to achieve greenhouse gas emissions reductions by 2050 will be the process by which building upgrade options are evaluated and incentivized. Currently, it is unclear in the extreme how qualifying systems are chosen, and the approved technology landscape across various buildings and incentives segments is extremely fractured.

As such, it is **critical** that an office of building energy performance be established with the oversight capability to streamline these decisions and clarify the requirements and process by which one may be included on any list of approved technologies.

- While an office of building energy performance would do much to improve the climate around building improvements, there needs to be a transparent methodology around technology approval, with criteria that are accessible to smaller companies that not have the significant resources of larger more established companies. I.e., it is critical that there be a path towards inclusion for small companies to ensure that innovative technologies are part of the solution for a more sustainable New York City.
- 28-320.5 Assistance will be critical for less affluent buildings to improve their own buildings. A transparent, highly vetted criteria for different levels of assistance will help not only with improvement of buildings that likely are the worst energy "offenders," but will also let technology developers cater their solutions in ways that could improve their cost effectiveness. It is also important here to realize that there are many levels of needed financial assistance, and any assistance, be it through up-front support or incentives, needs to be clear well in advance so that a building has confidence in certain assistance before any funds are spend on a potential project.
- 28-320.7.2 Variances – this section will be taken advantage of in every way possible, and this section should be defined with extreme care to avoid rendering the legislation toothless.

T2018-3294

NYC Sustainable Energy Loan Program

Clearly integral to any effort to improve building efficiency is the availability of funds to do so. There are two routes to loan programs for energy efficiency that in our experience have been most effective:

1) PACE – the pace program in various parts of the country have shown to be extremely effective in mobilizing buildings to enact improvements. Clearly, this specialized vehicle should be made

widely available in New York City, and made accessible to companies large and small to finance capital projects.

2) An alternate funding source that has been extremely effective for energy efficiency upgrades has been utility-sponsored on-bill financing. Since utilities already have a longstanding financial relationship with buildings, they are the best suited for establishing and offering loans of this type. It is our belief that including this type of loan option for buildings is uniquely enabling for energy efficiency upgrades that otherwise would be prohibitive if not impossible to fund.

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/2018

(PLEASE PRINT)

Name: Pete Scarpelli

Address: 34 Charlotte Place, Hartsdale NY 10530

I represent: Pegasus Capital Advisors

Address: 850 3rd Ave 18th Floor, NY NY

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☒ in opposition

Date: _____

(PLEASE PRINT)

Name: JOSEPHINE ZURICA, P.E.

Address: _____

I represent: American Council of Engineering Companies

Address: 8 West 38th st NYC (ACEC New York)

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Anthony Fiore

Address: DCAS

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. 1252 or 1253 Res. No. _____

☐ in favor ☒ in opposition

Date: _____

(PLEASE PRINT)

Name: Joseph Rosenberg

Address: 80 Maiden Lane

I represent: Catholic Community Relations Council

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☒ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Anthony M. Montalto

Address: 80 Pine St - 12th FL NY, NY 10005

I represent: ASHRAE NY Chapter

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: THEO MILLER

Address: HUNTER COLLEGE

I represent: CITY ATLAS / INSTITUTE FOR SUSTAINABLE CITIES AT HUNTER COLLEGE

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. 1253/1254 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Isabelle Silverman

Address: 327 CPW

I represent: EDF Envir. Defense Fund

Address: 257 PAS, NY NY

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: 12-4-18

(PLEASE PRINT)

Name: Elizabeth Kelly

Address: 438 E. 12th St. New York, NY

I represent: The Community Preservation Corporation

Address: 28 E 28th St. New York, NY

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: RICHARD REISS

Address: 42 W. 56 ST.

I represent: CITY ATLAS / INST. SUSTAINABLE CITIES / HUNTER COLLEGE

Address: HUNTER COLLEGE

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. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Jeff Perlman

Address: 215 W 80th St NY, NY 10024

I represent: Bright Power

Address: 11 Hanover Sq NY NY 10005

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card T2018-

I intend to appear and speak on Int. No. 3294 Res. No. _____

☑ in favor ☐ in opposition

Date: 12/04/18

(PLEASE PRINT)

Name: BRACKEN HENDRICKS

Address: 1931 PARK ROAD NW WASHINGTON, DC

I represent: DC PACE FINANCING / URBAN INGENUITY (CEO)

Address: SAME

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/2018

(PLEASE PRINT)

Name: Cecil Scheib

Address: 740 Broadway, 6TH FL NY NY 10003

I represent: New York University

Address: 70 Washington Sq S, NY NY 10012

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

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Carl Hum

Address: REBNY 570 Lexington Ave

I represent: REBNY

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Andrew Tilie

Address: 555 W 57 St 15th floor NY

I represent: Greater NY Hosp. Association

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Charles Fox

Address: Box 2982 Princeton NJ 08540

I represent: Bloom Energy

Address: 1299 Orleans Drive Sunnyvale, CA

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. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Donna DeCostanzo

Address: 40 W. 20th St, NY, NY 10011

I represent: NRDC

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Annel Hernandez

Address: 166A 22nd street

I represent: NYC Environmental Justice Alliance

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: 4 Dec 18

(PLEASE PRINT)

Name: Richard Leigh

Address: 415 Central Park West, 12C

I represent: Myself

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. 1251, 1252, 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/2018

(PLEASE PRINT)

Name: John Mandyck

Address: 55 Broad St 9th Floor

I represent: Urban Green Council

Address: 55 Broad St 9th Floor

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☐ in opposition CLIMATE BILL

Date: _____

(PLEASE PRINT)

Name: BUCK MOORHEAD

Address: 245 WEST 29TH ST NYC

I represent: NEW YORK PASSIVE HOUSE NYH20 DAMASCUS CITIZEN

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: John Cahoon

Address: _____

I represent: Con Edison

Address: 4 Irving Place

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. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Jason Lhwak

Address: 22 Sagamore Rd, Bxville, NY

I represent: Con Edison

Address: 4 Irving Place, NY, NY

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12-4-2018

(PLEASE PRINT)

Name: Margaret Perkins

Address: 180 West End Ave

I represent: 350NYC.org

Address: same

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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

☐ in favor ☐ in opposition

Date: 12-04-18

(PLEASE PRINT)

Name: Catherine McVay Hughes

Address: _____

I represent: Financial District Neighborhood Association

Address: FiDi

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. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Keith Kinch

Address: Brooklyn

I represent: BlocPower

Address: 81 Prospect Street, Brooklyn NY

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 3294 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Cliff Kellogg

Address: 3229 Albemarle Pl NW, Washington, DC

I represent: C-PACE Alliance

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Annie Garneva / ~~Public Employment~~

Address: 269 Martense St. Brooklyn 11226

I represent: NYC Employment + Training Coalition

Address: 110 Wall St. N.Y, NY 10005

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

1 Panel please
Just 5 Minutes

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☐ in opposition

Date: DEC 4 2018

(PLEASE PRINT)

Name: NYCC PRESIDENT PATRICK HOUSTON
RACHEL RIVERA CYNTHIA NORRIS

Address: 1 METROTECH CENTER NORTH

I represent: NEW YORK COMMUNITIES FOR CHANGE

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Bob Wyman

Address: 203 W 85th St, Apt PH2, NY 10024

I represent: S4/S

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: Nancy Bowen

Address: 445 6th St Brklyn NY 11215

I represent: Peoples Climate Movement - NY

Address: 119 W. 23rd St NYNY

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. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Jon Forster

Address: 125 Barclay Street

I represent: DC37

Address: 125 Barclay Street

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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

☒ in favor ☐ in opposition

Date: 12-4-2018

(PLEASE PRINT)

Name: PAULA SPEER

Address: 138 71st St., Apt ES, BROOKLYN, NY

I represent: 350 BROOKLYN + MYSELF 11209

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Aditi Varshneya

Address: 616 W 184 St. #32

I represent: WE ACT for Environmental Justice

Address: 1854 Amsterdam Ave

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

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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

☐ in favor ☐ in opposition

Date: ______

(PLEASE PRINT)

Name: SKIPP ROSEBORO

Address: 23 Pulaski St

I represent: NYCC - Climate Justice

Address: ______

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. ~~12/4/18~~

☒ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: STEPHAN EDEL

Address: 1 Metrotech Center Brooklyn

I represent: Working Families

Address: ______

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. ______

☒ in favor ☐ in opposition

Date: DEC 4, 2018

(PLEASE PRINT)

Name: Petra Luna

Address: 301 Grove Street, Brooklyn

I represent: Make The Road 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. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Annalyn Courtney

Address: 500 Greenwich St

I represent: VISIONS Services for the Blind

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Howard Styles / Local 94

Address: 120 B'way

I represent: Local 94 IUOE

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: FREDRIC GOLDNER

Address: 1449 ROSE LA., E. MEADOW NY 11554

I represent: NY CHAPTER ASSOCIATION OF ENERGY ENGINEERS

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. ______ Res. No. 1253

☐ in favor ☐ in opposition

Date: ______

(PLEASE PRINT)

Name: Daniel Avery

Address: One Penn Plaza

I represent: BOMA/NY

Address: One Penn Plaza

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1252 Res. No. ______

☒ in favor ☐ in opposition

Date: Dec 4, 2018

(PLEASE PRINT)

Name: Genevieve Sherman

Address: 28 Thorndal Circle, Darien CT

I represent: Greenworks Lending

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: DEC 4 2018

(PLEASE PRINT)

Name: Cynthia Norris

Address: 415 Hopkinson Ave 3C

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. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: December 4th, 2018

(PLEASE PRINT)

Name: McKenzie Schwartz

Address: _____

I represent: National Grid.

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Brett Thomason

Address: 433 E 75th St #17

I represent: ALIGN

Address: 50 Broadway

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/9/18

(PLEASE PRINT)

Name: David Cohen

Address: 25 West 18th Street

I represent: 32BJ SEIU

Address: 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. 1252 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: David Gabrielson

Address: Williamsburg, MA 01096

I represent: PACENation

Address: 141 Tompkins Pleasantville, NY

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: 12/4/18

(PLEASE PRINT)

Name: Judy Gelman Myers

Address: 116 W. 70th St.

I represent: Myself

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: 12/04/18

(PLEASE PRINT)

Name: Theron Jay Egg

Address: 4522 Declaration Dr Kissimmee, F

I represent: Egg Geothermal

Address: Same

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. 1253 Res. No. ______

☑ in favor ☐ in opposition

Date: 12-4-2018

(PLEASE PRINT)

Name: Mary Krieger

Address: 789 West End Ave. - Apt. 12B

I represent: NY NC Jewish Community Action Network

Address: info@JCAN.NYC.org

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: 12/4/18

(PLEASE PRINT)

Name: Paul van Linden Jr

Address: 890 E 7th #BR Brooklyn NYC

I represent: DC 37

Address: Brooklyn

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1252 Res. No. ______

☒ in favor ☐ in opposition

Date: ______

(PLEASE PRINT)

Name: ERIC ALINI

Address: 4 ARCHER ROAD HARRISON, NY

I represent: HANNON ARMSTRONG Sustainable Real Estate

Address: 1700 West Putnam Ave Old Greenwich CT

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. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Stas Zakrzewski

Address: _____

I represent: AIA New York

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Max Wolf

Address: _____

I represent: AIA New York

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: John Mealy

Address: _____

I represent: AIA New York

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. _____ Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Mark Chambers

Address: City Hall

I represent: Administration

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Colet Crawford

Address: _____

I represent: AIA New York

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Amy Turner

Address: 560 Lexington Ave, 15th Fl, 10022

I represent: NYC Climate Action Alliance

Address: same

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. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: James Neimeister

Address: 17-33 Stephen St 2L

I represent: NYC-DSA

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Joan Flynn

Address: 311 B148 ST

I represent: Rockaway Revolution

Address:

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1237 Res. No. _____

☐ in favor ☑ in opposition

Date: 12-5-18

(PLEASE PRINT)

Name: Phil Skalaski

Address: Durst Organization

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. 1253 Res. No. 2018

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Gustavo Gordillo

Address: 15 Stanton St. Apt 1B NY NY 10002

I represent: Democratic Socialists of America

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. 1253

☑ in favor ☐ in opposition

Date: 12/11/18

(PLEASE PRINT)

Name: Sarah Lyons

Address: 25-47 33rd St

I represent: DSA

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253-2018 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: LISA DICARLO

Address: 325 West 93rd Stact. NYC.

I represent: SIERRA CLUB

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. 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: KEN LEVENSON

Address: ~~450 LEXINGTON AVE~~ 623 11th St Brklyn

I represent: NORTH AMERICAN PASSIVE HOUSE NETWORK

Address: 450 LEXINGTON AVE

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1252, 1253 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: TIM KEATING

Address: 141 HOPKINS AVE, JERSEY CITY NJ 07306

I represent: RAINFOREST RELIEF

Address: PO BOX 8451, JERSEY CITY NJ 07308

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Andreas Banzing (NYPH)

Address: _____

I represent: NY Passive House

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. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: BONNIE MANDLER

Address: 20 W FAIR VIEW

I represent: BEST ENERGY POWER

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☐ in favor ☐ in opposition

Date: 12/14/2018

(PLEASE PRINT)

Name: Justin Pascone

Address: 1040 Avenue of the Americas

I represent: New York Building Congress

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: Mary Ann Rothman

Address: 110 Riverside Dr NYC 10024

I represent: CNYC - Council of NY Cooperatives & Condominiums

Address: 250 W57 St, #730, NYC 10107

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

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. _____ Res. No. 1253

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Cecil Sheib

Address: NYU

I represent: _____

Address: _____

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253; 1252 Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: Adriana Espinoza

Address: _____

I represent: NYLCV

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: 12/4/18

(PLEASE PRINT)

Name: JUDITH K. (JK) CANERA

Address: 716 E. 11TH ST #2R, NYC 10009

I represent: KEN GALE, NYC SAFE ENERGY CAMPAIGN

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. 3293 Res. No. _____

☑ in favor ☐ in opposition

Date: 12/4/2018

(PLEASE PRINT)

Name: SHAUN TOLBERT

Address: 9 Center St. Oceanport, NJ 07757

I represent: Rockwool

Address: 15 Metrotech Center Brooklyn 11201

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: 12/4/18

(PLEASE PRINT)

Name: Ismene Speliotis

Address: 1 Metrotech Center North 11th fl

I represent: MHANY Mutual Housing Authority of NY

Address: " "

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

I intend to appear and speak on Int. No. 1253 Res. No. _____

☑ in favor ☐ in opposition

Date: 12-4-18

(PLEASE PRINT)

Name: Ellen Osuna

Address: 73-63 260th St, Glen Oaks, 11004

I represent: self

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. _____ Res. No. _____

☒ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: ERIC ALINI

Address: _____

I represent: COUNTERPOINTE SUSTAINABLE REAL ESTATE

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. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: PAUL VAN LINDEN Tol.

Address: _____

I represent: DC 37

Address: 890 E 7th Str APT BR Brooklyn NY 11230

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

THE COUNCIL
THE CITY OF NEW YORK

Appearance Card

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

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: THEO MILLER

Address: HUNTER COLLEGE

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. _____ Res. No. _____

☐ in favor ☐ in opposition

Date: _____

(PLEASE PRINT)

Name: RICHARD REISS ~~+ THEO MILLER~~

Address: 42 W 56 ST

I represent: CITY ATLAS / INSTITUTE OF SUSTAINABLE

Address: HUNTER COLLEGE CITIES

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