

RetrofitNYC

Advancing Energy Efficiency in New York
City Multifamily Buildings



Foreword

The Master of Public Administration in Environmental Science and Policy (MPA-ESP) trains sophisticated managers and policymakers, who apply innovative, systems-based thinking to environmental issues. Graduates join a growing profession of earth systems problem-solvers: individuals prepared for leadership positions in local, state, and federal agencies, as well as in non-profits and environmental divisions of private corporations. They are also well suited for designing cost-effective programs and implementing policies. Most importantly, **a deep understanding of earth systems informs their work, allowing them to craft solutions to increasingly complex environmental problems.**

The milestone component of the MPA-ESP program educates these future environmental professionals through a process of learning by doing. Groups of 10 to 12 students are advised by a member of the faculty as they integrate their knowledge and apply management and analytical skills to solve problems for real-world clients. Through this experience, these **MPA-ESP candidates tackle cutting edge environmental and sustainability subjects, providing a free source of high quality management and policy analysis for clients** who otherwise might not have the resources to undertake such work.

Over the years, the MPA-ESP candidates have worked with public and non-governmental organizations both nationally, and internationally, helping these partners place critical issues on the agenda and learn from best practices of other organizations attempting similar tasks.

This year, our MPA-ESP candidates are working with the following local and international organizations:

- **New York State Department of Environmental Conservation & the U.S. Environmental Protection Agency**
- **Natural Resources Defense Council**
- **Building Energy Exchange of New York City**
- **Masdar Institute of Science and Technology of Abu Dhabi**
- **World Resources Institute**
- **Raritan Headwaters Association**

This report is informed by their 16-week interaction with the respective organizations and provides concrete policy analysis and recommendations.



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Preface

The Building Energy Exchange (BEE) is a New York City (NYC) based, independent non-profit energy efficiency resource center and networking hub that assists with market and opportunity analyses. To help bring Mayor de Blasio's 80-by-50 climate plan to fruition, BEE is studying the opportunities, available resources, and challenges associated with aggressively scaling up energy efficiency retrofits in NYC's diverse building stock.

Multifamily housing has been identified by the city government as a pivotal opportunity to reduce carbon emissions in a cost effective manner. In support of BEE's work, this team of MPA-ESP candidates have holistically examined the range of energy efficiency programs available to private multifamily housing buildings in NYC to identify current obstacles to participation in retrofit projects. In addition, this team has **interviewed 16 stakeholders** in the energy efficiency space of NYC and analyzed the **impact of recent and impending regulatory proceedings** in New York State. Finally, the team has also conducted a **multi-city comparative analysis of best practices in six major North American cities** to formulate appropriate recommendations for New York City to accelerate energy efficiency retrofits.

In addition to BEE, I recommend this report to three other groups of stakeholders in the multifamily building energy efficiency space of NYC.

- **Multifamily building owners** will find this report, in particular the incentive map in Annex G, to be a useful source of information regarding available energy efficiency incentive programs and their eligibility criteria;
- **Policy makers in the energy efficiency realm** of NYC will find the report's analysis useful for identifying priorities for the retrofit accelerator;
- **Energy efficiency program implementers** can use this report to ascertain the wider industry's view of the trends and impacts of current regulatory proceedings.



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- **Richard Yancey**, Executive Director, Building Energy Exchange of New York City;
- **Ellen Abramowitz**, Project Associate, Building Energy Exchange of New York City;
- **Lloyd Kass**, Mentor and Faculty Advisor.

List of Acronyms

BEEEx	Building Energy Exchange
CFLs	Compact Fluorescent Lamps
EEPS	Energy Efficiency Portfolio Standards
ENO	Entergy New Orleans
GHG	Greenhouse Gas
PSEG LI	Public Service Enterprise Group Long Island
LED	Light-Emitting Diodes
NYC	New York City
NYCEEC	New York City Energy Efficiency Corporation
NYS HCR	New York State Department of Housing and Community Renewal
NYSERDA	New York State Energy Research and Development Authority
MPSS	NYSERDA Multifamily Performance Program
NYS PSC	New York State Public Service Commission
PACE	Property-Assessed Clean Energy
RPS	Renewable Portfolio Standard
REV	Reforming the Energy Vision
SBC	System Benefits Charge
HOME	Toronto's Home Energy Loan

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Executive Summary

In 2014, the Mayor's Office of New York City (NYC) released "*One City: Built to Last*", an elaborate plan to reduce greenhouse gas (GHG) emissions by 80 percent from 2005 levels by the year 2050. One of the plan's major strategies, the Retrofit Accelerator, focuses on coordinated outreach and assistance to encourage private building owners to participate in energy efficiency programs. Multifamily buildings comprise nearly half of the building sector's energy usage, and have tremendous potential for energy savings. In response, the team examined existing multifamily programs in New York City and compared them with programs in six North American cities to identify challenges and best practices. Moreover, the team conducted interviews with 16 industry stakeholders to identify opportunities for the retrofit accelerator.

The team arrived at four key findings:

1. Participation in multifamily programs is hampered by the complexity of the energy efficiency landscape and overlaps between programs;
2. Current regulatory changes in New York's energy industry are causing uncertainty and disruption;
3. Effective multifamily energy efficiency programs of other cities incorporate a single brand, one-stop shop, innovative financing options, and contractor incentives;
4. Failure to understand building owners' priorities and decision-making processes inhibit effective outreach efforts.

In recognition of these findings, the team recommends:

1. Unifying the branding of existing multifamily programs to reduce complexity and coordinate the messaging of energy efficiency projects in New York City.
2. Implementing a one-stop shop for multifamily programs in New York City to simplify the application process.
3. Designing the Retrofit Accelerator to emphasize consumer beliefs, confidence, control, and continuity.

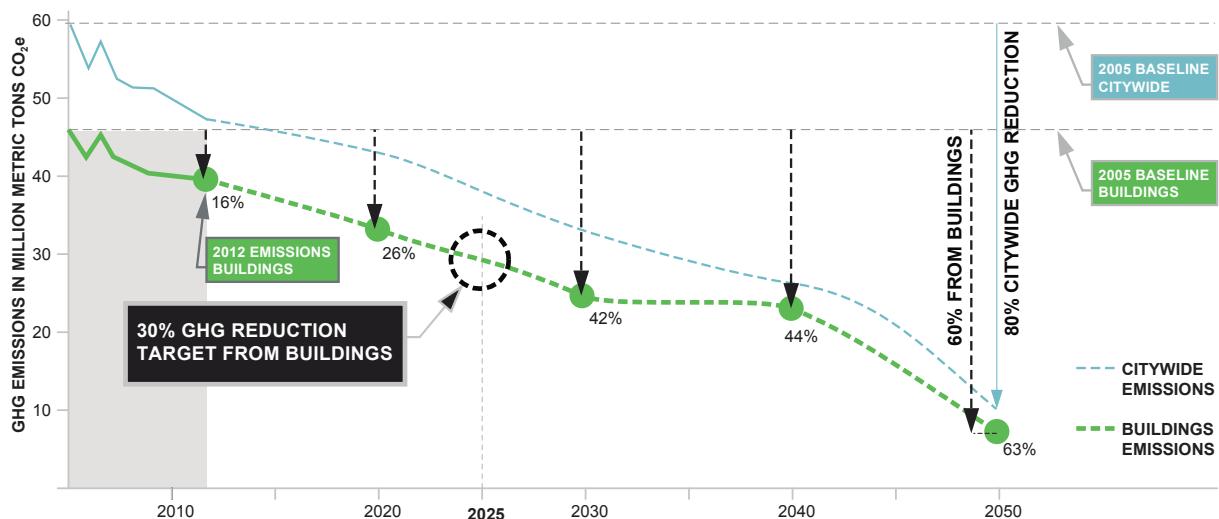
This report begins with a short background on the importance of multifamily buildings to GHG reductions in New York City and the purpose and methodology of this project. Next, Section 1 provides an overview of multifamily programs available in NYC and their associated challenges before Section 2 delves into the impact of recent regulatory changes. This lays the foundation for the analysis of multifamily programs in other cities in Section 3 to derive best practices to remediate existing shortcomings. Finally, Section 4 aggregates the findings and presents the team's recommendations for strengthening NYC multifamily energy efficiency programs before concluding.



Background

New York City is expected to face numerous challenges as a result of climate change, such as sea level rise, heat waves, and extreme storms. In response to these impending threats, Mayor Bill de Blasio released *One City: Built to Last*, a comprehensive city-wide plan that focuses on transforming public and private buildings in New York City into models of sustainability. The overall goal is to achieve an 80 percent reduction in greenhouse gas (GHG) emissions from 2005 levels by the year 2050 (80 by 50). A detailed timeline with interim goals leading up to 2050 can be seen in Figure 1, below. One strategy presented in the plan is the creation of the Retrofit Accelerator, a coordinated outreach and assistance program designed to help private building owners and decision-makers accelerate energy efficiency retrofits.

Pathways for Reductions in Greenhouse Gas Emissions from Buildings



Source: New York City Mayor's Office of Long-Term Planning and Sustainability

Figure 1: Pathways for Reductions in Greenhouse Gas Emissions from Buildings (Source: NYC Mayor's Office of Long-Term Planning and Sustainability)¹

I. Why Multifamily Buildings?

Buildings, public, commercial, and residential, account for nearly three-quarters of New York City's GHG emissions (Refer to Figure 2).² While GHG emissions have been reduced by 19 percent through targeted efforts in more than 4,000 city-owned buildings since 2005³, relatively less has been achieved in the private residential buildings.

¹ NYC Mayor's Office of Long-Term Planning and Sustainability. (2014). Retrieved from http://www.nyc.gov/html/plany/c/downloads/pdf/NYC_GHG_Inventory_2014.pdf.

² NYC Office of the Mayor. (2014). Mayor de Blasio Commits to 80 Percent Reduction of Greenhouse Gas Emissions by 2050. Starting with Sweeping Green Buildings Plan. Retrieved January 30, 2015, from: <http://www1.nyc.gov/office-of-the-mayor/news/451-14/mayor-de-blasio-commits-80-percent-reduction-greenhouse-gas-emissions-2050-starting-with/#/o>

³ NYC Mayor's Office of Long-Term Planning and Sustainability. (2014). Inventory of NYC Greenhouse Gas Emission. Retrieved from http://www.nyc.gov/html/plany/c/downloads/pdf/NYC_GHG_Inventory_2014.pdf.



In the residential sector, over half of the building sector's carbon footprint may be attributed to multifamily buildings. Multifamily buildings are defined by the U.S. Department of Housing and Urban Development as properties with five or more dwellings.⁴ There has been some progress on this front. Local Law 84 (LL84), a law developed under the Greener, Greater Buildings Plan⁵ of 2009, requires owners of large buildings to annually measure their energy consumption in a process called benchmarking.⁶ If the 80 by 50 target is to be reached, the city must turn its focus to the largely untapped potential of these multifamily buildings.

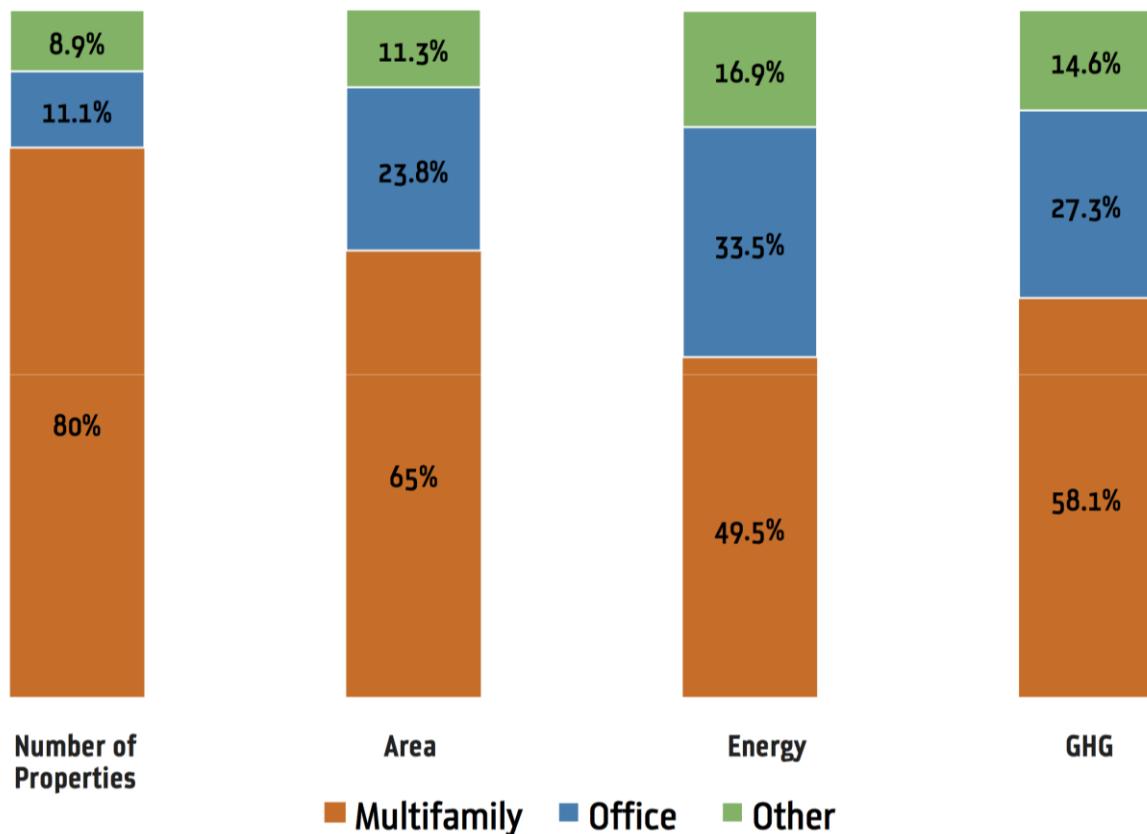


Figure 2: Proportional impact from multifamily, office, and other building sectors in New York City
(Source: LL84 Benchmarking Report, 2012)⁷

II. The Building Energy Exchange

Sponsored by the New York State and City governments as well as real estate and energy consulting firms, the Building Energy Exchange (BEEEx) is a non-profit that aims to promote energy efficiency to various decision-makers and residents in New York City. BEEEx's current project *Retrofitting Affordability* utilizes data from the city's LL84 benchmarking data to

⁴ HUD. (2014). Mortgage Insurance for Rental and Cooperative Housing: Section 221(d)(4). *Multifamily Housing - Program Description*. Retrieved from portal.hud.gov/hudportal/HUD?src=/program_offices/housing/mfh/progdesc/rentcoophsg221d3n4.

⁵ NYC Mayor's Office. Greener, Greater Buildings Plan. Retrieved from <http://www.nyc.gov/html/gbee/html/plan/plan.shtml>.

⁶ LL84 gives building owners and potential buyers a better understanding of a building's energy and water consumption, eventually shifting the market towards increasingly efficient, high-performing buildings. Buildings that do not participate are subjected to fines for each quarter of non-compliance.

⁷ PlanNYC. (2012). New York City Local Law 84 Benchmarking Report. *The City of New York*. Retrieved January 28, 2015, from: http://www.nyc.gov/html/gbee/downloads/pdf/nyc_ll84_benchmarking_report_2012.pdf



examine the potential of energy efficiency retrofit initiatives in the city's multifamily buildings to identify cost-effective opportunities for savings.

III. Project Purpose and Methodology

To assist BEEEx with their work and accelerate energy efficiency retrofits in NYC, the team analyzed and made recommendations for the city's multifamily energy efficiency programs. This project was conducted in three phases:

(1) NYC multifamily program analysis

The team conducted an examination of NYC multifamily energy efficiency programs to understand the current landscape. In particular, the team identified and investigated all multifamily programs offered by utilities, state and public agencies by comparing the incentive structures, strengths, and weaknesses of each program using program websites, reports by the American Council for an Energy-Efficient Economy (ACEEE), and utility program impact and process evaluation reports.

(2) Stakeholder interviews

The team held interviews with various stakeholders of the energy efficiency sector to gather qualitative professional insight on successes, challenges, and future developments. Stakeholders interviewed include multifamily program administrators, utility employees, and energy consultants. A list of all interviews can be seen in Appendix 3. The interviews also helped capture additional information not readily available through program websites and published research.

(3) Multi-city comparative analysis

The team conducted an analysis of multifamily energy efficiency programs in major North American cities to glean best practices. The strengths and weaknesses of multifamily energy efficiency programs in the following six cities were examined:

- Chicago, Illinois
- Toronto, Canada
- San Francisco, California
- Seattle, Washington
- Boston, Massachusetts
- New Orleans, Louisiana

These cities were selected based on their similarity to NYC in terms of building density, population density, age, stock, and climate as well as overall sophistication of energy efficiency programs. As an illustration, both Toronto and New Orleans have demonstrated innovative approaches to promoting customer participation in building energy efficiency. In



addition, together with New York City, Boston, Chicago, Seattle, and San Francisco have consistently ranked in the top ten cities on the ACEEE multifamily program scorecard.⁸

⁸ Johnson, Kate and Mackres, Eric (2013). Scaling Up Multifamily Energy Efficiency Programs: A Metropolitan Area Assessment. *American Council for an Energy-Efficient Economy*. Retrieved from <http://aceee.org/research-report/e135>.



1 | Challenges to Multifamily Retrofits in New York City

To accelerate retrofits in multifamily buildings, New York City must address common barriers prevalent throughout the sector as well as challenges unique to the city. Common barriers include split incentives, lack of financing, diversity of building stock, dispersed building ownership, and lack of data on energy use. In addition, New York City must deal with unique problems such as a broad range of programs and administrators, and the inevitable overlap that comes with a complicated landscape.

To demonstrate these challenges, this chapter discusses:

- Implications of common barriers to multifamily energy efficiency
- Geographical coverage of different public utilities
- Details of different multifamily energy efficiency programs in NYC

I. Common Barriers in the Multifamily Sector

Split incentives occur when the incentives of the building owner and the tenants are not aligned. This is commonly known as the principal-agent problem.⁹ For example, building owners do not stand to gain from reduced electricity usage achieved through the installation of energy efficient lighting as electricity costs are borne by tenants. Hence, building owners have no incentive to invest in energy efficient appliances and building retrofits. The division of incentives is an inherent by-product of the building's metering structure, where tenants pay for usage but the equipment is owned and replaced by the owner.

The often-sizeable upfront costs for retrofit projects and the **lack of clear pathways to financing** are a frequent problem for multifamily building owners. Many incentive programs require owners to pay a portion of the upfront costs, which are considerable for large projects. Low-income housing providers in particular have limited access to capital to pay for improvements.¹⁰ While financing options may be available, clear pathways to guide building owners through financing options are not very accessible. Budget cycles must also be considered as energy efficiency upgrades may compete with other capital projects for limited funds.

A city's **diversity of building stock** in terms of age and size further complicates the ability to develop a streamlined or "one size fits all" approach to energy retrofits.¹¹

⁹ Grossman, S. J., & Hart, O. D. (1983). An analysis of the principal-agent problem. *Econometrica: Journal of the Econometric Society*, 7-45.

¹⁰ Johnson, Kate. "Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings." ACEEE Report Number E13N.

¹¹ Energy Programs Consortium. (2013). Multifamily Energy Efficiency: Reported Barriers and Emerging Practices.



The presence of **multiple decision-makers** is a typical barrier in multifamily energy efficiency initiatives due to the different building ownership structures, which complicate the decision-making process. When multiple layers of decision makers are involved, various stakeholders must be convinced of the efficacy of energy-focused programs before a project can be implemented.¹² Moreover, there may be an absence of a clear review and decision-making process for incorporating energy efficiency initiatives into the building.

Finally, a **lack of data on energy use** and retrofit performance can discourage multifamily building owners from pursuing improvements. Uncertainty around potential energy savings due to confusion surrounding fluctuating fuel prices and lack of information on actual building energy use may diminish decision-makers' confidence in projected energy savings.¹³

II. Barriers Specific to NYC

In addition to common barriers, multifamily energy efficiency programs are further hampered by the diversity of programs and administrators as well as the presence of overlaps.

(1) Diversity of Programs and Administrators

The NYC energy landscape is uniquely complex due to the diversity of program administrators, utilities, and energy organizations involved. There are six major multifamily energy efficiency programs offered in NYC offered by five program administrators.

Two public entities offer three programs that serve the entire of city:

1. **New York State Department of Housing and Community Renewal (HCR)** is a state agency. It is comprised of all the state's major housing and renewal agencies.¹⁴ The New York State HCR administers the state's **Weatherization Assistance Program (WAP)** aimed at households with incomes at or below 60 percent of the state median income - generally referred to as low-to-middle income (LMI) housing.¹⁵ WAP is funded by the U.S. Departments of Energy and Health and Human Services. It covers single and multifamily buildings.

WAP prioritizes senior citizens, families with children, and persons with disabilities and is of no cost to the home occupant. Administration of the program is decentralized and complex. There are 13 local weatherization providers that serve different parts of NYC based on service area. WAP providers include local non-profit organizations and community action agencies, adding to the list of stakeholders involved in administering

¹² Bamberger, L. Scaling the Nationwide Energy Retrofit of Affordable Multifamily Housing : Innovations and Policy Recommendations. Washington, DC: Brookings Institution. Retrieved from http://www.brookings.edu/~/media/research/files/papers/2010/12/energy-bamberger/12_energy_bamberger.pdf.

¹³ Johnson, Kate. "Apartment Hunters: Programs Searching for Energy Savings in Multifamily Buildings." ACEEE Report Number E13N.

¹⁴ New York State Homes and Community Renewal (2015). Agency Description. *NYSHCR*. Retrieved <http://www.nyshcr.org/AboutUs/AgencyDescription.htm>

¹⁵ Both NYSERDA and NYSHCR define low-income as having income at or below 60 percent of the state median income level.



the program.¹⁶ Interested customers must first apply to their local weatherization provider to determine program eligibility. WAP providers then conduct an energy audit of the residence to identify energy efficiency needs and provide services to reduce the amount of energy required for heating, cooling and provision of hot water. This facilitates reduced energy consumption, thus minimizing the impact of higher fuel costs on low-income families.¹⁷

2. **New York State Energy Research and Development Authority (NYSERDA)** is a public benefit corporation that offers objective information and analyses, technical expertise, funding, and programs to help New Yorkers improve energy efficiency and renewable energy penetration. Activities of NYSERDA, including the energy efficiency programs that it administers, are primarily funded by ratepayers through the Energy Efficiency and Renewable Portfolio Standard (EEPS / RPS).

NYSERDA has two distinct multifamily energy efficiency programs: Multifamily Performance Program and EmPower New York. NYSERDA's **Multifamily Performance Program (MPP)** is a market-rate program that allows owners of 5+ units and 4+ floor buildings to design a customized, whole building energy solution tailored to the buildings. NYSERDA aims to achieve a 15 percent reduction relative to projected electricity use in 2015 as well as gas savings of 112 billion cubic feet annually by 2010.¹⁸ Incentives for existing buildings are categorized into base incentives and performance incentives. Base incentives are awarded as a series of payments upon completion of certain project milestones. In addition to base incentives, performance incentives are awarded in excess of base incentives for projects that show a minimum of 20 percent energy reduction.¹⁹ NYSERDA incentives cannot be combined with incentives or rebates from the utility programs. NYSERDA's second multifamily program, **EmPower New York** provides energy efficiency solutions to LMI residents at no cost. Under this program, a participating contractor conducts a building assessment on possible energy efficiency improvement measures and offers upgrades for the eligible homes. Energy efficiency solutions include replacement of old-style light bulbs with high-efficiency lighting and replacement of inefficient refrigerators and freezers with new certified models. EmPower also provides the residents with everyday strategies and tips to help them manage energy costs.

In addition, NYC residents are served by three investor-owned utilities (See Appendix 6 for more background), all of which have their own multifamily energy efficiency programs:

¹⁶ New York State Homes and Community Renewal. (2013). Weatherization Assistance Providers. Retrieved from <http://www.nyshcr.org/Programs/WWeatherizationAssistance/Providers.htm>.

¹⁷ Weatherization Assistance Program (2015).

Retrieved from <http://www.nyshcr.org/Publications/HousingInformationSeries/hiswap.pdf>

¹⁸ NYSERDA. (2015). "Multifamily Performance Program." Retrieved from <http://www.nyserda.ny.gov/All-Programs/Programs/MPP-Existing-Buildings>.

¹⁹ DSIRE (2015). "Multifamily Performance Program." Retrieved from http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=NY36F.



1. **National Grid** is a utility that provides energy efficiency incentives for multifamily buildings consisting of 5 to 75 units within their gas service territories through the Energy Efficiency and Services Rebate program.²⁰ The program provides free energy evaluations as well as cash rebates for boilers, furnaces, and water heaters.
2. **Consolidated Edison of New York (Con Edison)** is a utility providing electricity and gas in different areas of NYC. While separate from National Grid's multifamily program, Con Edison's Multifamily Energy Efficiency Program targets the same building size range for its service territories.²¹ The program provides direct installation of compact fluorescent lamps, water saving devices, and smart power strips within the units (without use of rebates). It provides rebates for lighting fixtures, light-emitting diodes (LED) exit signs, heating, ventilation and air conditioning (HVAC), and building management systems in common areas. The target audience for Con Edison's program is property owners and managers of buildings with 5 to 75 units.
3. **Public Service Enterprise Group Long Island (PSEG LI)** is an electric company that provides service to residents in the Far Rockaways. Due to its relatively small footprint, PSEG LI provides energy efficiency retrofits for multifamily buildings solely through its Universal Access program.²² This program primarily focuses on low-income multifamily buildings by providing direct installation of retrofits. The analysis provided in this report will not focus on PSEG LI's program due to its comparatively limited impact in the multifamily energy efficiency sector. More details on the programs can be found in Table 1.

²⁰ National Grid (2015). National Grid Incentives for Multifamily Buildings. Retrieved from http://www2.nationalgridus.com/multifamilyNYsave.jsp?WT.mc_id=multifamilyNYsave.

²¹ Con Edison (2015). About Us: Con Edison. Retrieved <http://www.coned.com/aboutus/>.

²² PSEG LI. (2014). Utility 2.0 Long Range Plan Update Document. Retrieved Feb 1, 2015, from: <https://www.psegliny.com/files.cfm/Utility20-Document-100614.pdf>.



Table 1: NYC multifamily energy efficiency program details

New York City Multifamily Energy Efficiency Program Details					
Program Provider(s)	Program Name	Type of Incentive	Annual Electric Savings Targets	Annual Gas Savings Targets	Program Budget
Con Edison	Multifamily Energy Efficiency Program	Direct install and rebates	8,614 MWh per year (from TRC Appendix)	147,912 Dth per year (from TRC Appendix)	Total budget from Jan 2012 - Dec 2015 = \$23,945,436 gas side and 29,493,216 elec side and \$4,748,800 low income for a total of \$58,187,452. That is \$14,546,863 per year for 4 years. ⁶
National Grid	Energy Efficiency Services and Rebates Program	Cash rebates	Not Applicable	31680 dekatherms	\$1,468,724
PSEG LI	Far Rockaway - Universal Access	Direct install	8800 MWh (proposed)	Not available	\$5,000,000
New York State Housing and Community Renewal	Weatherization Assistance Program	Direct install	Not available	Not available	\$50.2 million (2014-2015)
NYSERDA	EmPower Program	Direct install	130,168 MWh	756,047 dekatherms	Electric: \$35,957,892 Gas: \$64,627,060
	Multifamily Performance Program	Base + performance incentives	Existing buildings 108,124 MWh (238,293 MWh) New buildings 25,823 MWh (annualized, from TRC Appendix)	Existing buildings 417,476 dekatherms (1,101,321 MMbtu) New buildings 73,116 MWh (annualized, from TRC Appendix)	Existing buildings Electric: \$19,630,936 Gas: \$23,408,468 New buildings Total project costs for Downstate NYS area: \$51,311,954 (CRIS database 2014)
	Advanced Sub-metering Program	Direct install and rebates	12580 MWh	Not applicable	\$6,324,392.00

The three utilities in NYC serve different geographic areas, with distinct coverage for each fuel type (gas or electric). This results in three service zones in NYC. In Zone 1 - which covers Manhattan, the upper half of Queens, and the Bronx - Con Edison is the sole supplier of both electricity and gas. In Zone 2 - covering Staten Island, Brooklyn, and the lower half of Queens - Con Edison provides electricity while National Grid supplies gas. Finally, in Zone 3 - which covers the Far Rockaways - the electricity utility is PSEG LI while the gas utility is National Grid. Buildings in different service zones are, thus, eligible for different multifamily programs. A graphic representation of the service zones of these programs can be viewed in Figure 3.



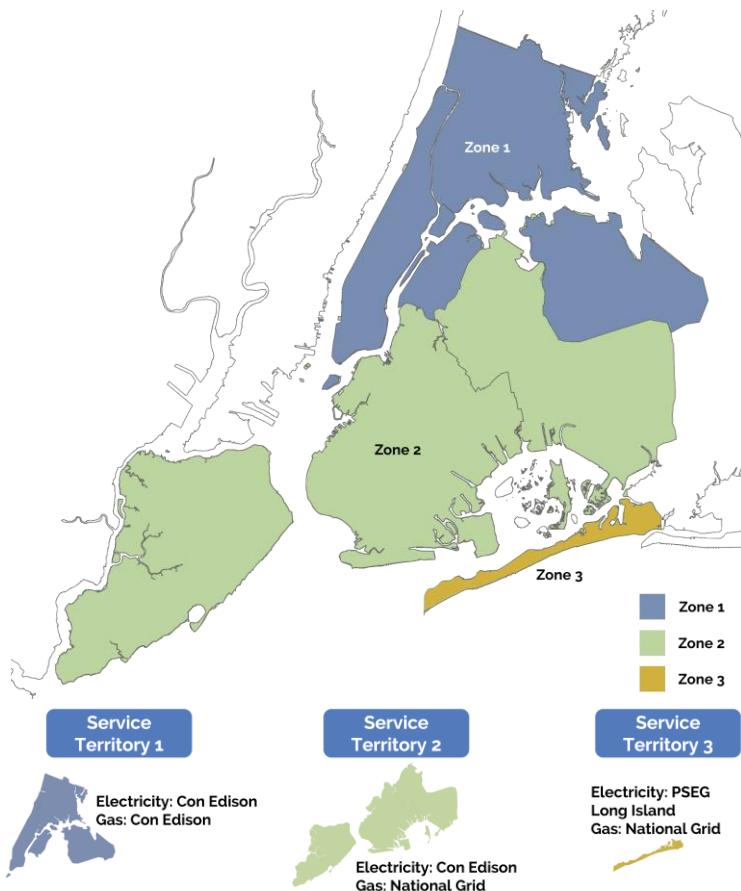


Figure 3: Map of NYC energy service zones

The diversity of programs and program administrators as well as different service coverage in different territories create tremendous confusion for building owners who find it difficult to navigate the maze of programs. This complexity is visualized in the multifamily incentive map and program matrix in Appendix 7.

(2) Program Overlap and Confusion

Among this diverse group of programs, there is overlap between utility programs and NYSERDA programs, as well as between NYSERDA's EmPower and HCR's WAP.

In the LMI sector, New York State HCR's WAP and NYSERDA's EmPower programs have different funding sources and objectives, but they provide similar programs. HCR's WAP is funded by federal funds and aims to reduce the energy cost borne by LMI residents, while NYSERDA's programs are funded by ratepayers in New York State through EEPS and are intended to improve energy efficiency in the state.



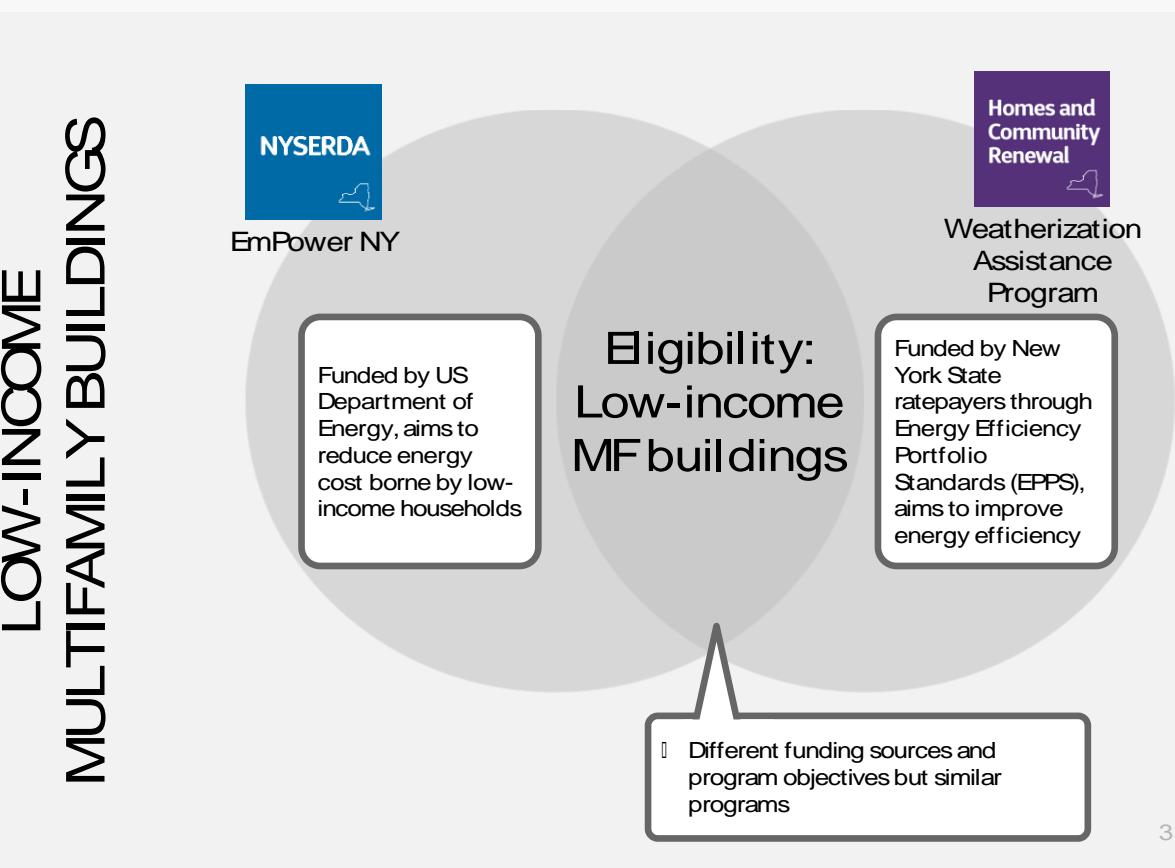
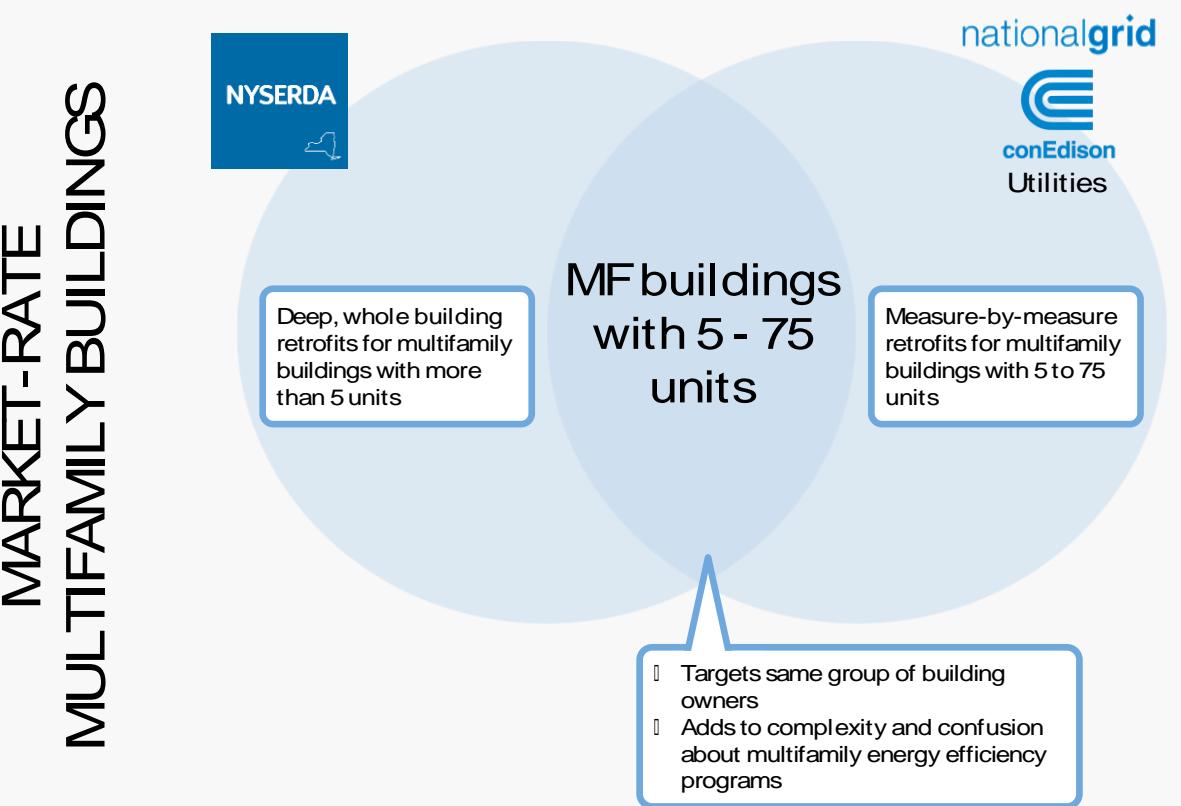


Figure 4: Overlaps for LMI and market-rate multifamily energy efficiency programs



There are two main issues associated with program overlap: inefficient use of funds from the program administrator's perspective and confusion for building owners.

First, from a programmatic perspective, although residents are prohibited from taking advantage of multiple programs, double-dipping²³ is difficult to monitor. It is therefore likely double-dipping occurs to some extent between NYSERDA and utility programs. This constitutes an inefficient use of limited funds meant to drive energy efficiency retrofits in the city. Moreover, there is likely duplicative expenditure of marketing dollars by various program providers on the same customer base.

Second, from the point of view of building owners, overlapping programs create unnecessary hassle as time and resources must be spent on deciding between similar programs. The overlap between programs available to multifamily buildings has created a highly complex environment. Owners and property managers of multifamily buildings often become confused when deciding to invest in energy efficiency measures for their building, which impedes uptake of the programs.

²³ Double-dipping: residents apply to receive and obtain benefits from multiple program providers, although such action is not allowed.



2 | Changes to the New York City Energy Industry

There is currently tremendous flux in New York State's utility regulatory landscape as regulatory proceedings that seek to modernize the industry are underway. The proceedings' ambiguity and short timeline have created unease in the industry and disagreements about what the future will hold. These have significant implications for the multifamily energy efficiency sector.

To demonstrate the changes in the industry, this chapter discusses:

- Current regulatory context in New York State
- Overview of the Reforming Energy Vision proceeding
- Stakeholders' perception of the regulatory changes

I. Current Regulatory Context

In 2008, the New York State Public Service Commission (NYSPSC) established the New York Energy Efficiency Portfolio Standards (EEPS).²⁴ As part of a statewide program to reduce New Yorkers' electricity usage by 15 percent of forecasted levels by the year 2015, the state's utilities and the New York State Energy Research and Development Authority (NYSERDA) were required to develop programs aimed at achieving these energy efficiency goals. A System Benefits Charge (SBC) on customer utility bills funded these programs. The charge supports a comprehensive set of energy efficiency programs for residential, multifamily, low-income, and commercial/industrial customers, as well as research and development efforts.²⁵

With the current EEPS cycle set to expire on December 31, 2015, the PSC announced the Reforming the Energy Vision (REV) proceedings which intend to overhaul the state's utility landscape and set the stage for a future based on distributed energy resources.²⁶

²⁴ NYSPSC. Energy Efficiency Portfolio Standard. Retrieved from

<http://www3.dps.ny.gov/W/PSCWeb.nsf/All/2197DAD6F78ECCB085257BA9005E71A6?OpenDocument>

²⁵ American Council for an Energy-Efficient Economy. (2015). State and local policy database. Retrieved from

<http://database.aceee.org/state/new-york>.

²⁶ Morris, Jackson. "REV-ing it up in New York: A Look Under the Hood of the Reforming the Energy Vision Track I Order." NRDC. Retrieved from http://switchboard.nrdc.org/blogs/jmorris/rev-ing_it_up_in_new_york_a_lo.html.



II. Reforming the Energy Vision (REV)

REV is the New York Public Services Commission's (PSC) plan to modernize the industry. Broadly, it aims to modernize electricity generation and distribution and increase the market's role in the new energy economy. Under the decision, the state's distribution utilities will take the lead in offering programs, which will gradually transition from a focus on "resource acquisition"²⁷ to a focus on long-term "market transformation" that "will drive more market-based approaches." The filing envisions the creation of a PSC-regulated Distributed System Platform Provider that performs integrated system planning, grid operations, and market operations. This will incorporate decentralized distributed energy resources, such as renewables and energy efficiency, into the planning and operation of electric distribution systems. Fundamentally, the PSC has proposed alterations to the roles of NYSERDA, utilities, and consumers. Under REV, NYSERDA will refocus on market and technology innovation strategies to support self-sustaining markets while electricity customers will become more active participants in the market. More details are available in Appendix 5.

III. Stakeholder Expectations for the Future



Figure 5: Word cloud from stakeholder interviews

The word cloud above in Figure 5 summarizes the key words stakeholders used during interviews when asked about the impact of recent regulatory proceedings on the future. While there was a large degree of heterogeneity in responses between stakeholders about the ways the REV proceedings would shake up the industry, *uncertainty* was a common and consistent theme, especially regarding program overlap, unity in the energy efficiency landscape and the impact of removing market-rate programs.

Ideally, utility representatives expressed hope that REV will lead to *less* program overlap.

²⁷ "Resource acquisition" refers to the traditional energy efficiency program model of providing incentives and prescriptive rebates to enhance acquisition of energy efficiency appliances. This approach to efficiency has been contrasted with a "market transformation" approach in which the benefits of the program are defined in terms of wide-scale penetration and market acceptance of efficiency measures.



since NYSERDA will move into an upstream market-maker role and discontinue their market-rate energy efficiency programs. Some stakeholders expressed concern that, if improperly handled, these proceedings may lead to even more overlap between incentive programs in the future. Reality will probably fall somewhere in the middle; how the transition is managed by the PSC, utilities, and NYSERDA remains to be clarified.

Several interviewees expressed hope that the REV proceedings will create more unity in the energy efficiency landscape as NYSERDA refocuses its role. However, interviewees also questioned whether the market is prepared for the changes proposed under REV and whether customers are ready to take on more active roles as participants.

There is also a growing debate about the impact of abolishing NYSERDA's market-rate multifamily program. Some interviews indicated uncertainty over whether there is sufficient awareness and interest in energy efficiency to sustain a new customer-centered market. Others voiced concerns about the possible loss of expertise as utilities are expected to take over much of NYSERDA's current role, uprooting the relationships NYSERDA has built with its network of program implementation partners.

Finally, some stakeholders argued that large amounts of money spent on energy efficiency programs have not actually reduced energy use, questioning if REV has considered this in their formulation of future plans. Even if energy efficiency programs are an effective use of funds, there are questions about whether the profit margins are sufficient to sustain a thriving energy efficiency market in future.

IV. Implications for Energy Efficiency Programs

The changes proposed under REV will have several important implications for multifamily energy efficiency programs.

(1) Customers will take on a larger role, thus program information must be communicated clearly

REV's intention to empower customers as active partners in energy distribution and planning makes the distribution of energy use information critical. At the moment, information in the multifamily energy efficiency space is inconsistent and overwhelming. With customers set to become active participants in the energy market, there will be a pressing need to make energy efficiency information accurate and digestible for multifamily stakeholders.

(2) Responsibility for market interface falls on utilities

As REV aims to shift NYSERDA into a more upstream role as a market facilitator, utilities may become the focal point of customer interaction. As new energy efficiency markets develop, many new market players will enter the arena, likely leading to compounded customer confusion. Thus, there is value in a government-led, cross-utility office to serve as a one-stop shop for multifamily energy efficiency programs.



(3) The energy efficiency market may contract if poorly managed

The implementation of REV and the associated scaling back of existing programs during the transition period will likely impact business for consultants who market and implement these programs. The expectation that the market will seamlessly fill the gap left by removal of energy efficiency programs may not develop easily, leading to rapid contraction of the industry.

(4) Energy efficiency uptake rates may decline during the transition period

During the transition to REV, utilities are expected to ramp down existing energy efficiency programs. This is a particularly acute problem for low-income housing initiatives, for which incentives play a big role in overcoming the financial barriers that hamper uptake of energy efficiency retrofits. This may delay progress towards NYC's goal of achieving an 80 percent reduction in greenhouse gas emissions from 2005 levels by 2050 due to a permanent loss of uptake for programs that may be forced to discontinue.

(5) Quantity of energy efficiency incentive offerings may increase

The development of new energy markets may result in the creation of more programs and actors to profit from the changes. However, as discussed in Section 1, more offerings are not necessarily good for the sector. Overlapping and duplicative offerings can be counter-productive for multifamily building owners who will need to deal with an ever-increasing volume of information and choices. There may be value in greater cooperation between energy efficiency program implementers to synergize programs.



3 | Opportunities for New York City Multifamily Programs

Six North American cities were chosen for analysis due to their physical similarities to New York City or creative energy efficiency programs. The team identified four traits that characterize effective programs: a single brand, one-stop shop, innovative financing options, and contractor incentives. These traits present opportunities to improve multifamily programs in New York City.

To demonstrate these opportunities, this chapter discusses:

- Rationale for selection of cities in multi-city analysis
- Overview of the key multifamily program in each city
- Best practices that have application in NYC

I. Multi-City Program Analysis

The team identified best practices from the multifamily programs of six North American cities: Chicago, Toronto, San Francisco, Seattle, Boston, and New Orleans. Figure 6 compares the multifamily housing sectors of NYC and the six cities. Fact sheets on each of the cities and their programs can be found at the end of this report (Appendix A).

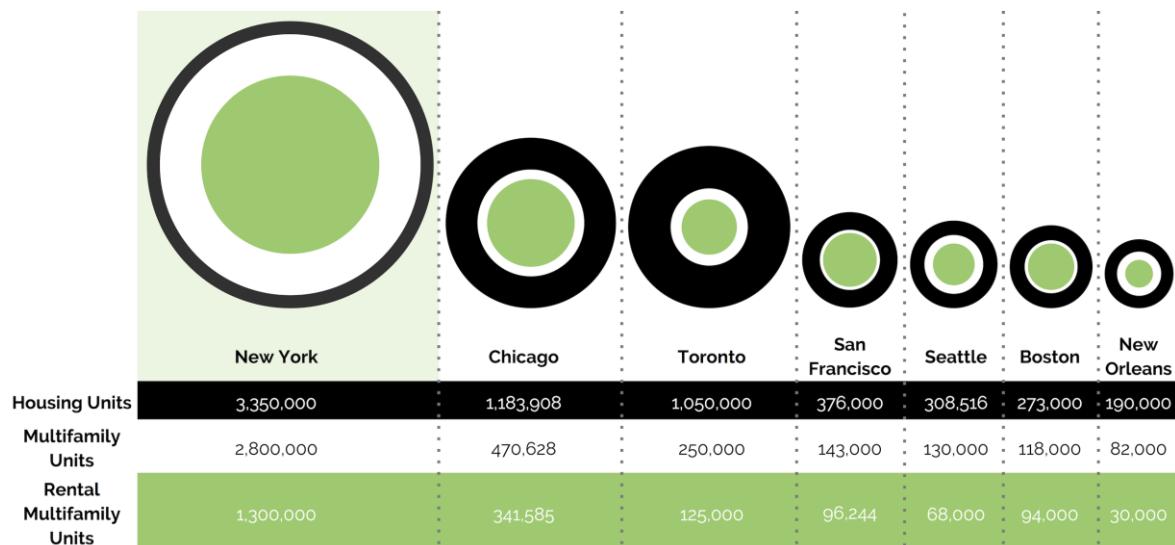


Figure 6: Multi-city demographic comparison

The cities were selected based on a similar climate, building stock and age, as well as maturity of their multifamily building programs. Though NYC stands alone in population and the



number of multifamily buildings, the six cities are relatively comparable. An overview of the key multifamily programs for each of the six cities can be seen in Table 2.

Table 2: Key multifamily programs in multi-city analysis

Snapshot of Key Multifamily Energy Efficiency Program in Six North American Cities				
City	All Program Providers in City	Key Program	Details of Key Program	Marketing Approach
Chicago	Commonwealth Edison; People's Gas; North Shore Gas; Elevate Energy; Community Investment Corporation; AFC	Multifamily Comprehensive Energy Efficiency Program	<ul style="list-style-type: none"> Rebates on efficient Central A/C and weatherization Energy Assessment with free installing energy efficient products, including showerheads, faucet aerators, programmable thermostats, pipe insulation and compact fluorescent light bulbs (CFLs) Rebates on natural gas boilers, natural gas water heater, pipe insulation, programmable thermostat, attic insulation, air sealing, duct sealing (People's Gas/North Shore Gas) 	Publicized by websites of both Electricity and Gas provider
Toronto	City of Toronto; Toronto Hydro; Enbridge Gas; Union Gas; saveONenergy	Home Energy Loan Program	<ul style="list-style-type: none"> Low-interest loans for up to 5% of assessed value of property to fund home energy efficiency upgrades and retrofits, requires initial energy audit 	Publicized on website and within available pilot areas
San Francisco	PG&E, City of San Francisco	Energy Efficiency Rebates for Multifamily Properties	<ul style="list-style-type: none"> Rebates to property owners and managers of multifamily dwellings that contain two or more units Encourages owners of existing properties to upgrade to qualifying energy efficient products in individual tenant units and in common areas of residential apartment buildings, mobile home parks and condominium complexes. 	Targeted at building owners; contractors, media outreach, and direct utility contact
Seattle	Seattle City Light, Puget Sound Energy, Office of Housing Services'	HomeWise	<ul style="list-style-type: none"> Income criteria to participate in free energy audits and free retrofits with Seattle City Light Income criteria to participate in free energy audits and free retrofits with PSE and loans may be available for other home improvement areas 	Publicized on website
Boston	Eversource (Nstar), National Grid, Columbia Gas of Massachusetts, The Berkshire Gas Company, Cape Light Compact, Utili, Liberty Utilities	Mass SAVE Multifamily Retrofit & Low-income Multifamily (LMF)	<ul style="list-style-type: none"> One-stop shop in which all the major utilities have come together to administer an energy efficiency program to minimize confusion and maximize participation Entire Mass SAVE program funded through a multitude of sources: RGGI proceeds (electric), System Benefit Charge (SBC), Forward Capacity Market proceeds (electric) LIMF component is in collaboration with the Low-Income Energy Affordability Network 	Direct marketing to building owners on Far Rockaways, Queens
New Orleans	Entergy New Orleans; City of New Orleans, Global Green USA, Southeast Energy Alliance	Energy Smart NOLA WISE	<ul style="list-style-type: none"> Incentives for both window and central air conditioner based on size of units and energy efficiency Rebates on air conditioner tune-up, solar hot water upgrade and installment of energy efficient products Rebates for homes that achieve improvement target based on HERS rating score Free direct install up to 20 free CFL bulbs Energy efficiency and weatherization upgrades for low-income renters and homeowners 	Publicized on websites, bill inserts, and through contractors

II. Best Practices from Multi-City Analysis

The multi-city analysis revealed specific best practices for NYC to consider for future program design. Details on the best practices gleaned from each city can be found in Appendix D. Best practices include: uniting the marketing efforts of energy efficiency programs under a single



brand; creating a one-stop shop for potential participants; innovative financing options to minimize split incentives; and contractor incentives to encourage contractors to engage building owners. Figure 7 below summarizes best practices from each of the six cities:

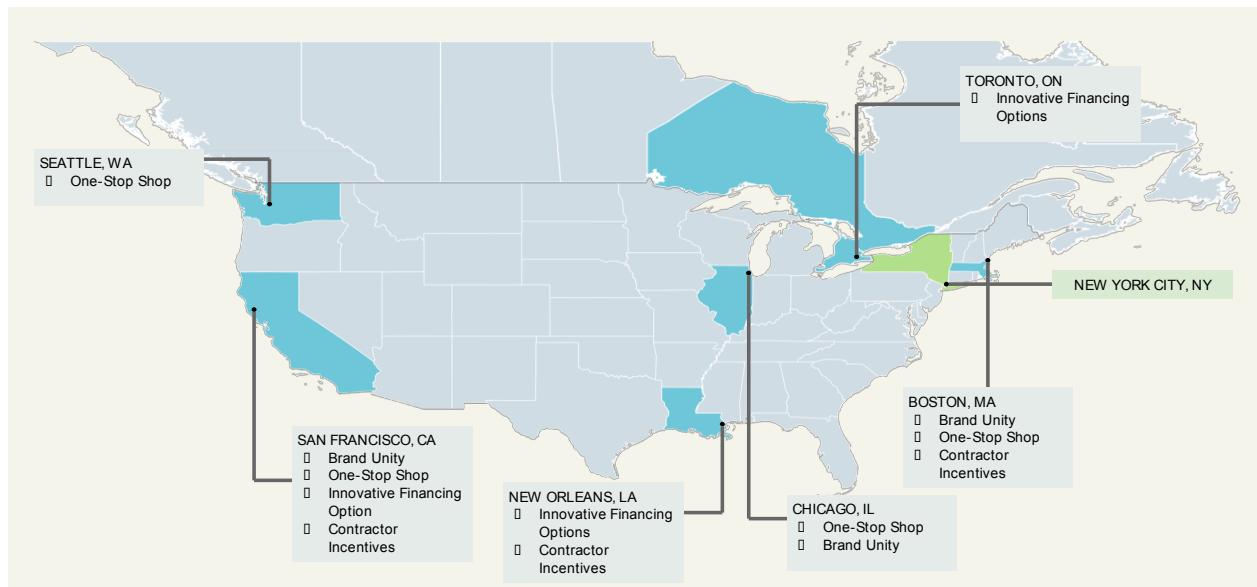


Figure 7: Map of selected cities and best practices

(1) A Single Brand

The unification of multifamily energy efficiency programs under a single marketing brand demonstrates a shared goal across all programs, reduces customer confusion, and can reduce promotional costs. The single, unified advertising strategy was observed in Boston's MassSave program, Chicago's Retrofit Chicago program, and San Francisco's Energy Upgrade California program.²⁸ In Boston and San Francisco, the program administrators established a trademark brand that included all energy efficiency programs available to the city. In Chicago, non-profits, utilities, community interest groups, and the city government partnered to attain a targeted and unified outreach initiative. These three overarching programs ensure that energy customers have an easily identifiable brand and a consistent and coordinated message for retrofits and energy efficiency.

(2) One-Stop Shop

A cross-program office that allows customers to obtain information from a single source serves to address program overlap and to narrow the gap between customers and program administrators. One-stop shops for energy efficiency programs have proved successful in Boston, Seattle, Chicago, and San Francisco. Boston's MassSave multifamily program offers a single point of contact for comprehensive retrofits specifically adapted to the individual building. Seattle's HomeWise program provides a single point of contact to guide low-income home and building owners through energy efficiency program logistics. Retrofit Chicago offers an expert hotline to

²⁸ This is a single brand for energy efficiency programs throughout the entire state of California.



connect interested customers to experts.²⁹ Finally, Energy Upgrade California offers a single point of contact for all Pacific Gas and Electric customers with access to a tiered incentive structure and guidance to a tailored energy efficiency program. These four cities have prospered in the energy efficiency arena as a result of streamlined access to information. The focus on innovation and close follow-up observed in these cities can serve as a model for NYC.

(3) Financing Options

Innovative financing options to offset high capital costs of intensive building retrofits allow building owners or property managers to pay the upfront costs without breaking the bank. The Home Energy Loan Program implemented in Toronto allows for loans worth up to 50 percent of the price of the new building retrofits and attaches the loan to the property itself and not to an individual. This type of financing addresses the issues of split incentives which often hinder building improvement due to the fact that energy efficiency improvements paid for by the building owner are reaped by the tenants or vice versa. Energy Upgrade California's Multifamily Program offered in San Francisco allows coverage of 20 to 40 percent of upgrade project costs as long as the chosen improvement project will meet a minimum of 10 percent in whole building energy savings.³⁰ In New Orleans the NOLA WISE Energy Efficiency Loan Program offers 5 to 6 percent interest rate loans for efficiency programs that ensure 15 percent or more energy savings. These types of loan programs allow for building improvements that will benefit both owners and tenants in the long-term.

(4) Contractor Incentives

Contractor incentives encourage interested contractors to engage their targeted customer base. These types of monetary incentives are paid to approved contractors who carry out qualified energy efficiency upgrades within participating homes and buildings. For instance, Boston's MassSave program partners with contractors and allows direct distribution of funding for certain efficiency improvements in order to expedite the process.³¹ Pacific Gas and Electric's Multifamily Energy Efficiency Rebate Program in San Francisco offers prescriptive rebates to contractors who actively recruit participants.

²⁹ City of Chicago. Retrofit Chicago: Residential Partnership. Retrieved from http://www.cityofchicago.org/city/en/progs/env/retrofit_chicagoresidentialsinglefamily.html.

³⁰ Energy Upgrade California: Bay Area Multifamily Building Enhancements. Retrieved from <http://www.box.com/shared/static/po1dsqtsh13rojows8ga.pdf>.

³¹ MassSave: Professional Incentives. Retrieved from <http://www.masssave.com/professionals/incentives>.



4 | Recommendations to Support New York City's Retrofit Accelerator Initiative

Based on research and interviews, the team has designed recommendations to address challenges hampering multifamily energy efficiency programs in New York City.

We find that:

- The Retrofit Accelerator should focus on “four C’s” to promote program uptake: consumer beliefs, confidence, continuity, and control.
- Unifying different programs under a single brand and implementing a one-stop shop design are two best practices that NYC multifamily energy efficiency programs should adopt.
- BEEEx can provide valuable thought leadership, be a resource bank, and be a networking hub, which is important as the State’s energy sector continues to evolve.
- Implications of the changes on the multifamily sector Overlaps between various

I. Areas of Focus for the Retrofit Accelerator

Through the interviews, stakeholders identified four distinct areas on which the Retrofit Accelerator should focus closely in its design. They are: **consumer beliefs**, **confidence**, **continuity**, and **control**.



Figure 8: Four areas of focus for the Retrofit Accelerator



Consumer beliefs refer to the fundamental questions of whether building owners care about and believe in energy efficiency. Energy efficiency typically "tends to be out of sight and can be cognitively slightly out of reach."³² The Retrofit Accelerator has an opportunity to market and frame energy efficiency in a way that also addresses issues that consumers prioritize, such as climate change and job creation.

For program uptake, there must be **confidence** in energy efficiency. There are varying perspectives regarding what baseline measurements should be used when assessing energy efficiency and which models best project potential energy savings. Ineffective models that overestimate energy savings from retrofit projects can cause building owners to lose faith in energy efficiency.

The person or entity with **control** and decision-making power must be identified and targeted. Buildings often use property management companies, and it can be difficult to locate the actual owner or decision-maker. Housing cooperatives' board of directors may have priorities different from those of property management offices for market rental buildings. Boards may be interested in efficiency measures but may face a complex and lengthy decision-making process. Market rental buildings might be more interested in cosmetic upgrades to attract potential tenants rather than substantive improvements. It is also important to understand how building owners design capital plans so that energy efficiency retrofits can better fit within these plans. In sum, dispersed ownership structures often mean going through several rounds of approvals to sign off on projects, so it is important to identify not only the decision-makers but also their motivations to best target program participation.

Finally, for programs to make an impact, they must be in an environment of **continuity**. Fluid and frequently changing regulations create investment uncertainty and make it difficult for incentive programs to succeed. Building owners who plan incentives into capital budgets must have faith that incentives promised to them would still be available when projects are eventually complete. Market partners must be assured that regulations support the continued existence of programs, as they expect fees for guiding clients through the process.

II. Strategies to Increase Multifamily Energy Efficiency Program Participation

It is important to understand building owners' decision-making process when considering energy efficiency retrofits. The process by which consumers make purchase decisions can be visualized through a marketing funnel, where a large pool of potential customers gradually shrinks down to a small number of actual participants. There is a comparable process for uptake of energy efficiency programs by building owners, with barriers that must be addressed at each step.

³² Melissa Wright, Director, NRDC City Energy Project, Mar 4, 2015.



The first step is to bring widespread awareness of energy efficiency to building owners and to educate about potential energy and cost savings. Among those who become aware, some will consider the opportunity to participate.

The next step is actual participation in a program, where building owners commission retrofits. After retrofits are implemented, they must ensure that the new equipment is operating properly in order to fully realize the projected energy savings and to receive proper performance-based compensation. Lastly, as with any marketing process, one hopes that the consumer has had a good experience with the program and will encourage others to participate through his/her advocacy. This process is visualized in Figure 9.

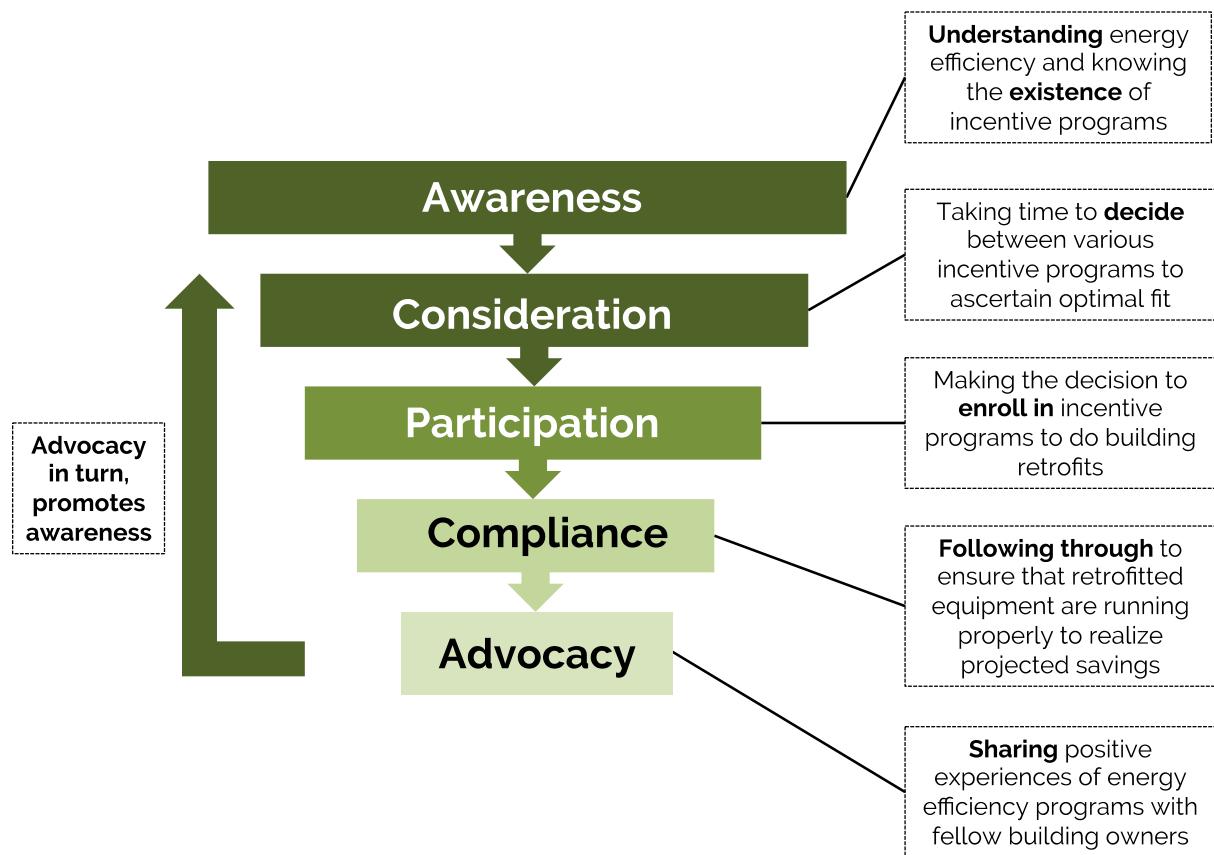


Figure 9: Retrofit participation funnel

Interviews revealed areas of improvement at several points of the funnel. At the awareness stage, having brand consistency and unity tend to be effective. In this case, building owners can easily recognize energy efficiency as one cohesive initiative instead of multiple efforts run by both the state and utilities. Another observation was that in addition to traditional marketing, contractors are also a great source of publicity for these programs and can help to increase participation levels through engagement. One-stop shops are effective in pushing building owners past the consideration stage and into participation, especially with smaller property management companies and building owners who do not have resources to



thoroughly explore technology and financing options. Proper training of building managers or owners must also be completed after equipment has been installed to ensure that new equipment is correctly used to realize maximum benefits.

Our findings from the multi-city analysis and stakeholder interviews revealed consistent approaches used by a variety of cities to tackle common challenges in the multifamily building sector. Of the four best practices gleaned from the multi-city analysis, two are particularly suited for NYC's at this moment:

(1) A single brand

The decision by utilities to operate independently under a unified program brand reduces customer confusion about energy efficiency and removes duplicative and inefficient marketing expenditures for program providers. A single, coordinated message of retrofits and energy efficiency will help building owners recognize energy efficiency as one cohesive initiative instead of disjointed efforts by different administrators. Regardless of the impact of current regulatory changes in NYC, a unified branding platform for all energy efficiency programs can help consolidate the information and build more customer awareness.

(2) One-stop shop

In contrast to conventional programs in which customers might be eligible for certain rebates but have to track down a contractor and navigate the program system, the one-stop shop decreases customer confusion and hassle as building pursue reductions in energy in energy use. This is significant for NYC, as multifamily building owners who do not have resources to thoroughly explore technology and financing options and may not be supported by a team of consultants are forced to evaluate the merits of different energy efficiency programs on their own.

Although some of the cities also make use of innovative financing methods and contractor incentives, these are not as suitable for NYC. First, NYC already has a spectrum of financing options available, including a low-interest loan offered by the New York City Energy Efficiency Corporation (NYCEEC). Adopting additional financing options in the city would therefore add complexity to the energy sector rather than synchronize program design. Second, most of the multifamily programs in NYC are already implemented through an extensive network of market players and trade allies, so there is little need to further incentivize contractors.



III. Opportunities for the Building Energy Exchange (BEEEx)

Given the recommendations above, BEEEx is in an opportune position to provide extra value-added services to augment the Retrofit Accelerator initiative in New York City. BEEEx can take on a role to fill the gaps in three spaces:

(1) Thought leadership

Thought leadership and research can increase customer confidence in energy efficiency as a concept. BEEEx can focus on developing awareness and improving the perceptions of energy efficiency in the multifamily sector through studies and research. BEEEx can also advocate for a single, consistent brand and one-stop shop practices for multifamily energy efficiency programs in the city.

(2) Resource center

BEEEx can help building owners navigate technical options and funding by serving as a single, comprehensive resource bank as well as a space for building owners to locate information that may not be easily accessible elsewhere. For instance, the incentive map provided in Appendix G is a good start.

(3) Networking hub and community space

BEEEx can act as a networking hub for utilities to engage with market partners as they adapt to market transformations under the Reforming the Energy Vision (REV) proceedings. BEEEx can serve as a space for utility stakeholders, as well as for individuals interested in the energy sector, to interact, learn, network, and seek advice as NYC transitions to a more customer-focused energy market.



Conclusion

In support of the Building Energy Exchange's work to help New York City actualize the Retrofit Accelerator initiative, our team has analyzed the city's five multifamily energy efficiency programs to identify gaps and overlaps, conducted interviews with 16 stakeholders to gain professional insight, and gleaned best practices from similar programs in six other North American cities.



Figure 10: Summary of recommendations for NYC multifamily programs to support Retrofit Accelerator

The **complex** maze of different multifamily energy efficiency programs and **overlap** between them has exacerbated barriers to program uptake. This is made worse by the uncertainty resulting from current and future regulatory changes in New York State. Of the four best practices identified through the multi-city comparative analysis, two are particularly applicable to New York City.

Unifying the branding of the existing multifamily energy efficiency programs in NYC will improve efficiency of marketing efforts and coordinate the message of retrofits, while a **one-stop shop** simplifies the energy efficiency program application process. These are particularly important for independent building owners and small property management companies who have limited resources and time necessary to navigate the current energy efficiency landscape.

In parallel, through extensive interviews with stakeholders, the team finds that the Retrofit Accelerator initiative would benefit from focusing on understanding issues such as **consumer beliefs, confidence, control, and continuity**. This will help the outreach and assistance effort of the Retrofit Accelerator to be more targeted and effective, moving the city one step closer to NYC's goal of an 80 percent reduction in greenhouse gases by the year 2050.



APPENDIX A | City Fact Sheets

Chicago City Factsheet

"In Chicago, Illinois, multifamily apartments account for almost two fifths of all housing units, and renters occupy more than 70 percent of multifamily apartments."³³

Chicago residents are served primarily by one electricity company, Commonwealth Edison (ComEd) and two gas companies, People's Gas and North Shore Gas. Utility companies provide various energy efficiency programs available to program managers, homeowners, and renters. The following programs below are applicable to multifamily buildings. More details are available in Table A-1.

- **ComEd: Smart Ideas Energy Efficiency Program**

The Smart Ideas Energy Efficiency Program provides prescriptive rebates related to building energy efficiency, including refrigerators, lighting, air conditioners, and peak hour management. This is available to all market-rate buildings.³⁴

- **ComEd, People's Gas, North Shore Gas: Multifamily Comprehensive Energy Efficiency Program**

In this program, ComEd, People's Gas, and North Shore Gas all closely collaborate to offer energy efficiency upgrades for building managers and owners through four mechanisms: (1) free energy assessments; (2) free direct installations of energy efficient products (shower heads, faucet aerators, compact fluorescent lamps (CFLs), programmable thermostats, pipe insulation); (3) discounted contractor services (pre-negotiated discount improvements, including steam pipe insulation, boiler tune-ups, lighting upgrades, exit signs, and lighting controls); and (4) standard and custom rebates for achieving recommended upgrades or projects.^{35,36}

- **Elevate Energy, Community Investment Corporation: Energy Savers**

Besides the utility companies, non-profit organizations have established a low-interest loan program named Energy Savers to provide energy assessments, retrofit plan recommendations, and financial support for homeowners in Chicago. Retrofit measures focused mostly on heating, domestic home water system, and building envelope improvements.³⁷

³³ United States Census Bureau. Retrieved from http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_13_5YR_DP04&prodType=table.

³⁴ Commonwealth Edison Rebate Programs. Retrieved from <https://www.comed.com/home-savings/rebates-tips/Pages/home-energy-assessment.aspx>.

³⁵ People's Gas Multifamily Energy Saving Program. Retrieved from http://www.peoplesgasdelivery.com/home/rebates_multifamily.aspx.

³⁶ North Shore Gas Multifamily Energy Saving Program.

³⁷ Community Investment Corporation. (2015). Energy Savers Can Save You Money. Retrieved from <http://www.cicchicago.com/loan-programs/energy-savers-can-save-you-money/>.



Table A-1: Chicago multifamily energy efficiency program details

Chicago Multifamily Energy Efficiency Program Details				
Program Provider(s)	Program Name	Type of Program	Program Details	Marketing Approach
Elevate Energy; Community Investment Corporation (CIC)	Energy Savers	Low-interest loan	<ul style="list-style-type: none"> Energy Savers Loans at fixed rate of 3% with a 7-year term as a second mortgage Retrofit measures focus mostly on heating, domestic home water system, and building envelope improvements 	Publicized on Retrofit Chicago Initiative website
Commonwealth Edison (ComEd)	Smart Ideas Energy Efficiency Programs	Prescriptive rebate	<ul style="list-style-type: none"> Free pick up and recycling of old working fridge or freezer and refund \$35 Receive instant in-store discounts on select Energy Star certified CFLs and LEDs. Receive bill credits for allowing ComEd to remotely turn compressor on and off Earn a credit on electric bill by reducing use during peak time savings hours 	Publicized by ComEd, utility provider
Commonwealth Edison in partnership with People's Gas/ North Shore Gas	Multi-Family Comprehensive Energy Efficiency Program	Prescriptive rebate; free assessment & direct install	<ul style="list-style-type: none"> Rebates on energy efficiency central A/ C and weatherization Free installment of energy efficient products, including showerheads, faucet aerators, programmable thermostats, pipe insulation, and CFLs Rebates on natural gas boilers, natural gas water heater, pipe insulation, programmable thermostat, attic insulation, air sealing, duct sealing (People's Gas/ North Shore Gas) 	Publicized by electricity and gas provider
AFC First with 6 utility companies	Illinois Energy Efficiency Loan Program -- Multifamily Residential Building Energy Efficiency Loan Program	Low-interest loan	<ul style="list-style-type: none"> Low-interest rate loan for utility upgrade participants 	Publicized by website; accessible through utility company websites



Toronto City Factsheet

"Toronto, Ontario is home to 2.8 million people, which is the largest population of Canadian cities.³⁸ Here the total electricity use per capita exceeds that of larger cities with higher populations such as Chicago, London, Tokyo and New York City.³⁹ Torontonians use mostly natural gas for space heating, and as a result natural gas combustion in residential and commercial buildings make up 40 percent of all GHG emissions in the city."⁴⁰

Toronto currently has a diverse network of public and private entities that address building energy efficiency issues. Three utility companies service Toronto. Toronto Hydro provides electricity to the entire city, and Enbridge Gas and Union Gas both provide natural gas for different parts of the city. Each of these utilities offers programs to increase building energy efficiency. Highlighted below are three utility programs aimed at multi-family residential buildings of 5+ units along with a City of Toronto efficiency initiative. Further details can be found in Table A-2.

- **Toronto Hydro: RETROFIT Program**

Available to building owners and managers, the RETROFIT Program offers rebates up to half of the total project costs when energy efficient retrofits are implemented.⁴¹ RETROFIT offers three types of incentives: prescriptive, engineered, and custom. Prescriptive incentives include lighting, motors or air conditioning unit upgrades and are issued from a defined list of equipment. Engineered incentives are based on the savings after performing retrofits or installing new equipment. Custom incentives are also based on peak electricity consumption reductions, but allow for projects that are not included in the other two incentive types.⁴²

- **Enbridge Gas: Multi-Residential Retrofit Incentive Program**

This program offers up to \$100,000 in incentives to help pay for apartment or condominium building energy efficient improvements.⁴³ The program offers custom or fixed incentives for natural gas savings due to improvements such as converting to

³⁸ City of Toronto. (2015). Toronto Facts. Retrieved from <http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=dbe867b42d853410VgnVCM10000071d60f89RCRD&vgnextchannel=57a12cc817453410VgnVCM10000071d60f89RCRD>.

³⁹ Toronto Energy Efficiency Office. Energy Efficiency and Beyond. Toronto's Sustainable Energy Plan Staff Background Report. (2007). p 16. Retrieved from http://www.ontario-sea.org/Storage/29/2100_Toronto%20%80%99s_Sustainable_Energy_Plan.pdf.

⁴⁰ ICF International. (2007). Greenhouse Gases and Air Pollutants in the City of Toronto: Toward a Harmonized Strategy for Reducing Emissions. p 11. Retrieved from http://www1.toronto.ca/city_of_toronto/environment_and_energy/key_priorities/files/pdf/ghg-aq-inventory-june2007.pdf.

⁴¹ Toronto Hydro: For Multi-Residential Buildings. (2015). Retrieved from <http://www.torontohydro.com/sites/electricsystem/electricityconservation/businessconservation/Pages/ForMulti-residentialBuildings.aspx>.

⁴² Toronto Hydro. (2013). saveONenergy: RETROFIT PROGRAM. Install Energy-Efficient Measures and Receive up to 50% of Your Project Costs. Retrieved from http://www.torontohydro.com/sites/electricsystem/electricityconservation/businessconservation/Documents/Retrofit_Program_Feb2012.pdf.

⁴³ Enbridge Gas: Retrofit Incentives. <https://www.enbridgegas.com/businesses/energy-management/commercial/incentives-and-services/retrofit-incentives.aspx#Retrofit%20Incentive>



high-efficiency boilers, combination water and space heating systems, better building controls, efficient insulation and ventilation. These incentives are available only to multi-residential buildings that are within the Enbridge Gas distribution network and are current customers.

- **Union Gas: Multi-Installation Bonus**

The Multi-Installation Bonus is only offered to multifamily buildings of 10+ units within the Union Gas service territory. Bonuses include financial incentives for space heating and water heating efficiency improvements, and they range from a 25 percent incentive bonus for 6-30 new installations to a 50 percent incentive bonus for more than 30 installations.⁴⁴

- **City of Toronto: Home Energy Loan Program (HELP)**

The Home Energy Loan Program, or HELP, offers a unique take on energy efficiency improvements that includes a low-interest loan that is tied to the property, not the individual. HELP was introduced in 2013 as a pilot program and is currently only available to single-family homes.⁴⁵ HELP has aimed to break down the barriers of split incentives between property owners and tenants, but its limited scope has hindered its uptake rate in Toronto.

⁴⁴ Union Gas: 2015 Multi-Installation Bonus. <http://www.uniongas.com/business/save-money-and-energy/multi-installation-bonus>.

⁴⁵ Toronto: Home Energy Loan Program (HELP).

<http://www1.toronto.ca/wps/portal/contentonly?vgnextoid=7e00643063fe7410VgnVCM10000071d60f89RCRD>.



Table A-2: Toronto multifamily energy efficiency program details

Toronto Multifamily Energy Efficiency Program Details				
Program Provider(s)	Program Name	Type of Program	Program Details	Marketing Approach
City of Toronto	Home Energy Loan Program (HELP)	Low-interest loan	<ul style="list-style-type: none"> • Low-interest loans for up to 5% of assessed value of property to fund home energy efficiency upgrades and retrofits • Requires initial energy audit • Eligible green roof projects can receive \$75/ square meter up to \$100,000 • Eligible cool roof projects can receive \$2.5/ square meter up to \$50,000 	Publicized on website and within available pilot areas
	Eco-Roof Incentive Program	Custom rebate	<ul style="list-style-type: none"> • Rebates for lighting and controls, unitary AC, alternative energy measures worth up to 50% of project costs through prescriptive, engineered or custom incentives; • \$400/ kW for lighting measures and \$800/ kW for non-lighting measures 	Publicized on website for existing buildings, is now required on new construction
Toronto Hydro	Retrofit Program	Prescriptive, engineered, or custom Rebate	<ul style="list-style-type: none"> • Targets homeowners and tenants to install energy-saving light bulbs, power strips, programmable thermostats, weatherstripping, draft proofing, insulation, energy efficient appliances, water-saving faucets and showerheads 	Publicized on website and to all qualified customers
	Home Assistance Program	Direct install	<ul style="list-style-type: none"> • Free insulation and draft proofing to low-to-middle income Enbridge Gas distribution customers 	Free to low-rise social/ assisted housing
Enbridge Gas	Home Winterproofing Program	Direct install	<ul style="list-style-type: none"> • Offer energy audits and retrofits funded by custom incentives up to \$100,000, or fixed incentives for the amount of the efficiency rate of new equipment 	Free to low-to-middle income Enbridge Gas distribution customers
	Multi-Residential Incentive Program	Custom or fixed rebate	<ul style="list-style-type: none"> • Energy audits and retrofits funded based off of energy savings: <ul style="list-style-type: none"> • \$1600 for achieving 25-49% in annual gas savings, or • \$2000 for achieving 50% and above in annual gas savings 	-
	Home Energy Conservation Program	Custom rebate	<ul style="list-style-type: none"> • Insulation, draft proofing, water-saving products and programmable thermostats funded entirely by Union Gas as part of the company's conservation plan 	-
Union Gas	Home Weatherization Program	Direct install	<ul style="list-style-type: none"> • Rebates can cover up to 100% of qualified project costs to reduce energy use and greenhouse gas emissions in residential high rise buildings 	Free to low-to-middle income Union Gas distribution customers
City of Toronto - Toronto Atmospheric Fund	Towerwise	Custom Rebate	<ul style="list-style-type: none"> • Rebates for ENERGY STAR qualified heating and cooling systems, appliances and lighting 	-
saveONenergy - Ontario Power Authority	Heating and Cooling Incentive	Prescriptive rebate	<ul style="list-style-type: none"> • Rebates for ENERGY STAR qualified heating and cooling systems, appliances and lighting 	Publicized on website and by ENERGY STAR appliance carriers



San Francisco City Factsheet

"In 2008 California adopted the state's first Long-Term Energy Efficiency Strategic Plan, making energy efficiency the highest priority procurement resource. Energy efficiency programs are developed and administered by the state's four investor-owned utilities (IOUs), which operate as regulated monopolies."

San Francisco is served by Pacific Gas & Electric (PG&E). Multifamily programs in San Francisco are comprised of two multifamily programs, a statewide low-income weatherization assistance program developed and implemented by the IOUs, and an additional multifamily rebate program provided by the city of San Francisco. The programs are described below. Further details can be found in Table A-3.

- **PG&E: Energy Efficiency Rebates for Multifamily Properties**

This program offers prescriptive rebates to property owners and managers of multifamily dwellings that contain 2+ units. The program encourages owners of existing properties to upgrade to qualifying energy-efficient products in individual tenant units and in the common areas of residential apartment buildings. Contractors work with the utilities and take the lead in promoting and delivering the program directly to the target audience.

- **PG&E: Energy Upgrade CA Pilot**

This pilot program was launched in 2013 as a whole building program providing free home energy assessments, rebates paid to the property owner for achieving at least 8 percent whole building savings, and further tiered incentives based on modeled savings. The program was implemented by a third party implementer called Build It Green. Though the program was open to both market-rate and low-income entities, only low-income housing participated, possibly because of budget cycle and incentive payment reasons. The projects all fell within the greater San Francisco Bay Area, none within the city of San Francisco. However, the program developed seven properties and 513 units and produced a significant amount of savings.⁴⁶ Following 2014 evaluations, the program will be re-launched in 2015.

- **PG&E: Energy Savings Assistance Program**

This is a low-income direct install weatherization program for all qualified low-income renters in homes five years or older within PG&E service territory. The premise of the program is to reduce energy bills for low-income residents by providing energy saving improvements (including repairing or replacing a refrigerator, furnace or water heater and installing insulation, weatherproofing, energy-efficient light bulbs, caulking, and

⁴⁶ There were an estimated 668,536 annual kWh ex ante savings for an average of 1,303 kWh saved per each of the 513 units. It also produced an estimated 24,687 annual therms ex ante savings for an average of 48 therms saved per unit. Total assessment and upgrade incentives amounted to \$527,470, indicating \$1,028 in incentives spent per unit and \$0.79 spent per first-year kWh ex ante savings.



low-flow showerheads) at no cost. Eligibility is determined by a certain annual gross household income.

- **City of San Francisco: SF Energy Watch Multifamily Plus**

This is a very limited program provided by the city of San Francisco and is meant to be conducted in coordination with the PG&E programs. Energy Watch provides free home energy assessments and incentives for lighting and boiler measures. It is open to multifamily homes with 5+ units or commercially metered common areas.

Table A-3: San Francisco multifamily energy efficiency program details

San Francisco Multifamily Energy Efficiency Program Details				
Program Provider(s)	Program Name	Type of Program	Program Details	Marketing Approach
PG&E	Energy Efficiency Rebates for Multifamily Properties	Prescriptive rebate	<ul style="list-style-type: none"> • Offers energy efficiency rebates to property owners and managers of multifamily dwellings that contain two or more units. • Encourages owners of existing properties to upgrade to qualifying energy-efficient products in individual tenant units and in common areas of residential apartment buildings, mobile home parks and condominium complexes. 	Targeted at building owners; contractors, media outreach, and direct utility contact
	Energy Upgrade CA Pilot	Whole building	<ul style="list-style-type: none"> • Free home energy assessment; \$750 Flat per-unit rebate paid to property owner for achieving 8% or greater whole building savings through multiple energy saving improvements; TIERED incentives based on modeled savings 	Not available
	Energy Savings Assistance Program	Direct install weatherization	<ul style="list-style-type: none"> • Direct install weatherization measures for all low-income residential 	Through the California Alternative Rates for Energy (CARE) Program (low-income assistance program)
City of San Francisco	SF Energy Watch Multifamily Plus	Rebate	<ul style="list-style-type: none"> • Free home energy assessment; lighting and boiler measures; additional measures available through EUC 	Targeted at building owners



Seattle Factsheet

"Multifamily residential apartments make up approximately a third of all housing units in Seattle, Washington. These apartments are eligible for a slew of energy efficiency programs, ranging from rebates and subsidies that serve individual apartment units to specialized programs specifically catered to whole multifamily buildings."

Seattle multifamily residents are served by a single electric utility, the publicly owned Seattle City Light (SCL), and a single gas utility, the privately owned Puget Sound Energy (PSE). Both utilities have separate energy efficiency programs. SCL has a broader range of programs than PSE since electricity is used by all households in Seattle, while gas is not served universally. Key programs are highlighted below with further details available in Table A-4.

- **Seattle City Light: Powerful Neighbors Program**

Apart from basic appliance rebates for lighting, refrigerators, and water heaters, Seattle City Light has three targeted programs. The Powerful Neighbors Program distributes free Light Emitting Diodes (LED) light bulbs and advanced powerstrips to multifamily units.⁴⁷

- **Seattle City Light: BUILT SMART**

For affordable housing, Seattle City Light provides prescriptive rebates for low-income multifamily buildings that install energy efficient equipment during construction or renovation.⁴⁸

- **Seattle City Light: Multifamily Incentive Program**

To target multifamily buildings specifically, the Multifamily Incentive Program provides lighting, heating, cooling, and window insulation incentives for multifamily building common areas.⁴⁹

- **Puget Sound Energy (PSE): Appliance Rebates**

PSE provides rebates for residential gas-based heating equipment, which may be more common in single-home buildings.

- **Seattle Office of Housing: HomeWise Program**

Within this program, the Seattle Office of Housing administers federal funds to provide weatherization assistance for low-income apartments. While the HomeWise program is intended to be similar to the Weatherization Assistance Program (WAP) of the New

⁴⁷ Seattle City Light. (2015a). Powerful Neighborhoods Program for multifamily building owners. *Powerful Neighbors*. Retrieved April 5, 2015, from: <http://www.seattle.gov/light/conserve/multifamily/install.htm>

⁴⁸ Seattle City Light. (2015b). Appendix D. *BUILT SMART Specifications*. Retrieved March 20, 2015, from: http://www.seattle.gov/light/conserve/resident/bsbinder/cv5_bs22.html

⁴⁹ Seattle City Light. (2015c). Energy Saving Upgrades for your property. *Multifamily*. Retrieved March 25, 2015, from: <http://www.seattle.gov/light/conserve/multifamily/>



York State Homes and Community Renewal (HCR) since they are funded similarly,⁵⁰ it provides further value. It serves as a one-stop shop platform to facilitate customer service and reduce confusion. Multifamily buildings are income-eligible if they have 51 percent or more households⁵¹ with income below 60 percent of the Washington State Median Income Level.⁵² All income-eligible buildings can then apply to the Office of Housing to request an energy audit. Eligibility for weatherization services is then determined from the audit results.

Table A-4: Seattle multifamily energy efficiency program details

Seattle Multifamily Energy Efficiency Program Details				
Program Provider(s)	Program Name	Type of Program	Program Details	Marketing Approach
Seattle City Light	Individual unit appliance rebate	Prescriptive incentives	<ul style="list-style-type: none"> Refrigerator, electric clothes washer, water heater (prescribed with specific list of eligible appliances) Secondary refrigerator/ freezer in basement (custom rebate, cannot double-dip with refrigerator rebate above) 	Publicized on website
	Multifamily incentives (Multifamily Retrofit Rebate Portfolio)	Prescriptive rebates and custom incentives	<ul style="list-style-type: none"> Up to 70% rebate for lighting retrofits (custom rebate) \$5 rebate for each single pane to double pane retrofit \$3 rebate for each aluminum double pane to vinyl double pane retrofit (custom rebate) 	Publicized on website
	Home Lighting Program	Direct subsidies	<ul style="list-style-type: none"> Direct subsidy (subsidizes producers off the shelf) for LED Light bulbs 	Direct vendor marketing to customers
	Power Neighborhoods Program	Direct install	<ul style="list-style-type: none"> Free LED bulbs and advanced powerstrips with sensors (5+unit multifamily buildings) 	Publicized on website
	BUILT SMART for affordable housing	Prescriptive incentives	<ul style="list-style-type: none"> Prescriptive rebates for installing energy efficient technologies in buildings Low-income criteria (80%occupancy by groups < Seattle median- income) Covers lighting, HVAC, washers Prescriptive rebates for installing energy efficient lighting in multifamily buildings 	Publicized on website
Puget Sound Energy	Appliance rebate	Prescriptive incentives and direct subsidies	<ul style="list-style-type: none"> New boiler, new forced air-furnace, new fireplace, new integrated space and water heating system (prescriptive) Direct subsidy for energy efficiency lighting (subsidizes selected producers off the shelf) Free recycling at 300 recycling locations (Light bulbs) Rebate on window retrofits (prescriptive, mail in) 	Publicized on website
Office of Housing Services	HomeWise	One-stop shop	<ul style="list-style-type: none"> Income criteria to participate in free energy audits and free retrofits with Seattle City Light Income criteria to participate in free energy audits and free retrofits with PSE and loans may be available for other home improvement areas 	Publicized on website

⁵⁰ Weatherization assistance programs throughout the United States are primarily funded by Department of Energy and Department of Health and Human Services although each jurisdiction can augment those funds separately.

⁵¹ Washington State University. (2012). Community Power Works. *Washington State University Energy Program*. Retrieved January 21, 2015, from:

<http://www.energy.wsu.edu/Portals/0/documents/Seattle%20Community%20Power%20Works%20Fall%202012%20Progress%20%20Report%20Final.pdf>

⁵² Hepinstall, D. (2011). Achieving Energy Efficiency in Multifamily Buildings. *Association for Energy Affordability*. Retrieved January 25, 2015, from: http://www.waptac.org/data/files/Website_Docs/events/conferences/2011-DOE-National-Conference/Tuesday/T11-T27-Introduction-to-Multifamily-Hepinstall.pdf



Boston City Factsheet

"With a population of roughly 630,000, multifamily units comprise 43 percent of the housing stock, the majority of which are rent-based, in Boston, Massachusetts."⁵³

Boston residents are primarily served by Eversource for electricity and National Grid for gas. Both utilities offer various energy efficiency rebates for individual customers (such as appliance rebates), but for energy efficiency programs Boston operates very differently than NYC. The two program implementers, along a number of other utilities, have joined together to administer residential, commercial, and industrial energy efficiency programs behind a unified front. The most important program, MassSave, is summarized below with details of other programs found in Table A-5.

- **Eversource, National Grid, Berkshire Gas, Liberty Utilities, Blackstone Gas Company, Columbia Gas of Massachusetts, Unitil, Cape Light Compact: MassSave**

Massachusetts' gas and electric utilities have implemented the statewide MassSave brand, an umbrella organization under which all the program administrators collaborate to offer energy savings programs. All administrators involved with MassSave administer energy efficiency programs as individual utilities; MassSave is not a separate entity but a trademark brand for the administrators to achieve synergy in program offerings, delivery models, application forms, awareness and marketing strategies.⁵⁴ Under the MassSave brand, there is a market-rate Multifamily Retrofit Program and a Low-Income Multifamily Program, both of which are one-stop shop type of programs. The one-stop shop approach offers customers free home energy assessments. Depending on what the assessment reveals, retrofit measures for the thermal building envelope, the building's lighting systems, and the mechanical systems of the building are then followed up on by certified contractors. Because the different administrators vary in size, the amount of resources available with each utility varies. As a consequence, the smaller administrators tend to be more vulnerable to changes in resource requirements. To address this particular issue, and also to ensure sufficient coordination is achieved for MassSave to operate smoothly, management committees with PA representatives have been established.

⁵³ United States Census Bureau (2014). ACS 2009-2013 5-year data estimates. Retrieved <http://afffbk.dads.census.gov/html/busy.html>

⁵⁴ Halfpenny, Christina; Gundal, Frank; White, Carol; Livermore, John; Baston, Doug; Mosenthal, Phil; Guerard, Mike, and Arnold, Gabe (2012). MassSave: A New Model for Statewide Energy Efficiency Programs. ACEEE. Retrieved <http://aceee.org/files/proceedings/2012/data/papers/0193-000169.pdf>



Table A-5: Boston multifamily energy efficiency program details

Boston Multifamily Energy Efficiency Program Details				
Program Provider(s)	Program Name	Type of Program	Program Details	Marketing Approach
Columbia Gas of Massachusetts, Berkshire Gas Company, Cape Light Compact, Eversource (Nstar), National Grid, Utilil, Liberty Utilities.	Mass SAVE Multifamily Retrofit	Direct install and rebates	<ul style="list-style-type: none"> One-stop shop in which all the major utilities come together to administer an energy efficiency program to minimize confusion and maximize participation Entire Mass SAVE program is funded through a multitude of sources; RGGI proceeds (electric), System Benefit Charge (SBC), Forward Capacity Market proceeds (electric) 	Brand website, social media campaign
	Mass SAVE Low-Income Multifamily (LIMF)	Direct install and rebates	<ul style="list-style-type: none"> LIMF component is in collaboration with the Low-Income Energy Affordability Network 	Brand website, publicized on partner website (Low Income Energy Affordability Network)
Action for Boston Community Development (ABCD)	Weatherization Assistance Program (WAP)	Direct install	<ul style="list-style-type: none"> Some buildings can qualify for both WAP and LIMF funding 	Publicized on website
National Grid	Individual unit appliance rebate	Rebate	<ul style="list-style-type: none"> In-store special pricing: <ul style="list-style-type: none"> Up to \$3 off eligible ENERGY STAR certified CFLs Up to \$15 off eligible ES certified LEDs, up to \$15 off eligible ES certified fixtures compatible with CFL or LED 	Publicized on website
	Individual unit appliance rebate	Prescriptive rebate	<ul style="list-style-type: none"> Mail-in \$50 rebate with purchase of ES Most Efficient refrigerator 	Publicized on website
	Individual unit appliance rebate	Prescriptive rebate	<ul style="list-style-type: none"> Mail-in \$40 rebate with purchase of ES certified room air cleaner or purifier 	Publicized on website
	Individual unit appliance rebate	Prescriptive rebate	<ul style="list-style-type: none"> \$50 reward for recycling second fridge or freezer- not the primary fridge or freezer Unit must meet size requirement of 10-30 cubic feet 	Publicized on website
National Grid, Eversource, Cape Light Compact, Liberty Utilities, Utilil and Columbia Gas of MA	HEAT Loan	Zero-interest loan	<ul style="list-style-type: none"> Zero-interest loan for up to \$25,000 to assist customers with installing qualified energy efficiency improvements home Loan given out by credit unions participating in the program with program administrators 	Publicized on Mass Save brand website



New Orleans City Factsheet

"Multifamily units comprise roughly 41 percent of the housing stock in the city of New Orleans, Louisiana, which has a population of 378,717 people."

The city of New Orleans receives electric and gas service from the utility Entergy New Orleans, Inc. (ENO). As a relative newcomer in energy efficiency, New Orleans has aimed to rebuild the city while simultaneously lowering energy use and growing a green workforce. All programs are offered to single and multifamily buildings. While NYC is more developed in energy efficiency in the multifamily sector, New Orleans may provide innovative marketing and financing insight, as it is a city with limited resources. Key programs are summarized below with more details found in Table A-6.

- **Entergy New Orleans (ENO): Energy Smart Program**

With the help of the New Orleans City Council, ENO developed this comprehensive, electric-only program to promote a market for energy efficiency products and services.⁵⁵ The program offers cash incentives to customers, or is paid directly to contractors. Offered on a first-come, first served basis, Energy Smart provides free home energy assessments and rebates for energy improvements made by qualified contractors. Rebates include air conditioning tune-ups, the purchase of ENERGY STAR central and window air conditioning units, ceiling and wall insulation, duct and home leakage sealing, and solar water heating as well as other energy efficiency measures. In addition, it provides free ongoing training to contractors to promote energy efficiency in the market.⁵⁶

- **City of New Orleans, Global Green USA, Southeast Energy Alliance: NOLA WISE**

NOLA WISE (standing for New Orleans, Louisiana; worthwhile investments save energy) is a low-interest loan program developed by Global Green USA in partnership with the city, the non-profit organization Southeast Energy Alliance, and the Department of Energy to help homeowners reduce energy use by 15 percent or more. NOLA WISE now works in conjunction with ENO's Energy Smart Program to create a green model for the rebuilding of New Orleans.⁵⁷ The program also serves as a full scale home energy retrofit program, offers reduced credit requirements, and provides energy efficiency training for contractors. Contractor training is a priority to help grow businesses by driving retrofit action and market interest in local energy efficiency financing mechanisms.⁵⁸ While NOLA WISE is available to multifamily buildings, it is also open to single and commercial buildings.

⁵⁵ Energy Smart Nola. (2015). What is Energy Smart? Retrieved from http://www.energysmartnola.info/about/what_is_energysmart.php.

⁵⁶ City of New Orleans. (2014). Energy Efficiency Program. Retrieved from <http://www.nola.gov/environmental-affairs/energy-efficiency/>.

⁵⁷ Global Green USA - New Orleans Office. (2015). Energy Efficiency at Home. Retrieved from <http://www.nolawise.org/#!ee-homes/c1np8>.

⁵⁸ Southeast Energy Alliance. (2013). Energy Pro³:Productivity, Progress and Prosperity for the Southeast. Retrieved from <http://www.seealliance.org/wp-content/uploads/SEEA-EnergyPro3-Report.pdf>.



Table A-6: New Orleans multifamily energy efficiency program details

New Orleans Multifamily Energy Efficiency Program Details				
Program Provider(s)	Program Name	Type of Program	Program Details	Marketing Approach
Entergy New Orleans	Energy Smart: ENERGY STAR Air Conditioner	Prescriptive rebate	<ul style="list-style-type: none"> Incentives for both window and central air conditioning (A/C) units Energy savings calculated based on size of units and their comparison to equally sized but less efficient models 	Publicized on website
	Energy Smart: Air Conditioner Tune-up	Prescriptive rebate	<ul style="list-style-type: none"> \$75 rebate on tune-ups 	Publicized on website, bill inserts, and through contractors
	Energy Smart: Cool-Saver A/C	Discount	<ul style="list-style-type: none"> \$175 rebate discount on original price for central air conditioner or heat pump that is at least one year old 	Publicized on website
	Energy Smart: New Homes	Prescriptive rebate	<ul style="list-style-type: none"> Prescriptive Path Measure or Performance Path Measure (Homes that achieve a third party Home Energy Rating System (HERS) rating of 85 or lower qualify for \$200 rebate) \$375 rebate for HERS rating 70 or lower For all builders, developers, homeowners interested in efficiency above building code 	Publicized on website and through contractors
	Energy Smart: CFL Direct Install	Direct install	<ul style="list-style-type: none"> Customers can receive up to 20 free CFL bulbs 	Publicized on website and retail stores
	Energy Smart: Hard to Reach	Prescriptive or custom rebate	<ul style="list-style-type: none"> Energy efficiency and weatherization upgrades for low-income renters and homeowners 	Publicized on website, bill inserts, and through contractors
	Energy Smart: Solar Hot Water Heater	Prescriptive rebate	<ul style="list-style-type: none"> Rebates up to \$1000 based on individual measures and/or whole home upgrades (kWh savings(annual) x \$0.34/$kWh$) \$15 APS; \$400 pool-pump \$350 heat pump water heater \$35 small A/C's, \$50 large A/Cs for Energy Star Window A/C - up to 4 window units; Energy Star Central A/C's prescriptive to A/C or heat pump unit; up to \$950 rebate; in addition to other tax credits/rebates 	Publicized on website
City of New Orleans, Global Green USA, Southeast Energy Alliance	NOLA WISE	Low-interest loan	<ul style="list-style-type: none"> Provides loans to those who wish to improve the energy efficiency of their existing property by 15% or more Available to single, multifamily, and commercial buildings. 	Targeted paid media campaign, advertising on local media, homeowner showcases



APPENDIX B | List of interview questions

Implementation & Client Interaction

1. Can you tell us about your role in program implementation?
2. What type of clients do you have? Large property owners/manager? Large buildings? Small buildings? Affordable versus market rate housing?
3. How do you help them decide which program to use?
4. What are some challenges when helping clients with these programs?
5. What are some common issues with program implementation at the City/Utility/State level?

Programs

1. In your opinion, what are the goals of the program and how are they changing?
2. What are strengths or weaknesses of the programs?
3. Which of the programs are more or less effective for certain segments of the multifamily sector?
4. What would make the program better?

Industry

1. To your knowledge, what other multifamily incentive program or program models in the US have been successful? What could NYC "import" from these other locales?
2. Where do you see state and local clean energy policy going and what impacts do you anticipate on multifamily programs?



APPENDIX C: List of Interviewed Stakeholders

Table C-1: Stakeholder interviews by organization

Organization Type	Contact Name	Organization
NGOs	Adam Hinge	Sustainable Energy Partnerships
	Melissa Wright	NRDC - City Energy Project
	Bomee Jung	Enterprise Community Partners
Government	Patrick Love	Mayor's Office
	Jenna Tatum	Mayor's Office
Consultants	Jonathan Braman	Bright Power
	Dave Hepinstall	Association for Energy Affordability
	Cary Hirschstein	HR&A Advisors
	Erica Brabon	Steven Winter Associates
	Adin Meir	CodeGreen
	Ryan Southard	-
	Mark Lorentzen	TRC
Program Owners	Louis Rizzo	National Grid
	Philip Madnick	Con Edison
	-	NYSERDA
Property Management	Luke Falk	Adjunct Faculty, Columbia University



APPENDIX D | Best Practices of Multifamily Programs from Each City

In **Chicago**, focus on a single brand is observed. Multiple stakeholders collaborate under Retrofit Chicago, a city-wide initiative that provides a one-stop platform for energy efficiency in residential buildings. Retrofit Chicago is supported by the cooperation between the non-profit Elevate Energy,⁵⁹ utilities, and the city. The one-stop shop⁶⁰ utilizes an information-sharing mechanism to save time for customers. The electricity and gas companies – Commonwealth Edison, People's Gas, and North Shore Gas – also closely partner to deliver the Multifamily Energy Savings Program, which provides homeowners and renters with a free on-site energy survey of energy usage and building condition. Retrofit Chicago's website breaks down program offerings into commercial, municipal, and residential, to simplify the information for customers to identify qualifying programs.

The **Toronto** utility Enbridge Gas offers free weatherization packages to its low-income customers. This structure appeals to tenants and building owners alike. The city of Toronto's Home Energy Loan Program (HELP) offers innovative Property-Assessed Clean Energy (PACE) financing, which ties loan repayments to property taxes and not directly to the consumer. HELP also supports Toronto's goal towards energy efficiency and water conservation. A Multi-Installation Bonus administered by Union Gas also provides innovative financial incentives with a 25 to 50 percent incentive bonus for space heating and water heating efficiency improvements for customers with 10+ unit buildings.⁶¹

Energy efficiency programs in **San Francisco** are developed by the state's four investor-owned utilities; thus, there is consistency and brand unity throughout the state. Pacific Gas & Electric – the utility serving the city – delivers both a straightforward multifamily prescriptive rebate program as well as a whole building custom incentive program. The utility also provides multifamily customers with a single point of contact, whose role is to explain the available program options and guide customers to the most appropriate fit. California is also one of the few states in the U.S. that has enacted PACE financing legislation and is operating PACE programs.

Seattle has established the HomeWise program administered by the Seattle Office of Housing. HomeWise serves as a one-stop shop for low-income multifamily weatherization efforts. While weatherization services are meant to be basic and non-value augmenting,⁶² multifamily buildings that are deemed ineligible are still offered financing options if they wish to pursue energy retrofits. In contrast with NYC, where building owners must decide between various low-income multifamily programs, a single point of contact through HomeWise

⁵⁹ Elevate Energy. (2015). About Elevate Energy. Retrieved from <http://www.elevateenergy.org/about/>.

⁶⁰ One stop shop: the method of streamlining programs and incentives into a single comprehensive program.

⁶¹ Union Gas: 2015 Multi-Installation Bonus. Retrieved from <http://www.uniongas.com/business/save-money-and-energy/multi-installation-bonus>.

⁶² This is contrasted with property value-augmenting energy efficiency retrofits, which can raise the property value of the building substantially.



reduces confusion and hassle for those in pursuit of reducing energy costs.⁶³ HomeWise also works closely with the two utilities in Seattle to help the city more effectively serve the entire energy efficiency value-chain. When low-income multifamily buildings are deemed ineligible for weatherization, they are referred to the gas and electric utilities operating in the city,⁶⁴ which then propose value-augmenting retrofits based off the energy audit.

Boston's unified advertising strategy called MassSave is widely considered successful. MassSave is a statewide program administered by the eleven electric and gas utilities. It delivers energy savings under a unified brand, avoiding program overlap and potential competition. The MassSave program website allows customers to view energy efficiency offerings by sector or program type. The one-stop shop approach ensures that customers get all their energy efficiency needs - from home energy assessments to discussing the identified saving measures with a certified contractor - covered under one program. This minimizes customer confusion and allows customers to spend resources on energy efficiency more effectively. MassSave has taken its marketing strategy a step further through social media, such as Twitter and Facebook, to run campaigns and reach customers. In 2014 MassSave was recognized for its "Like to Save" campaign by the Association of Energy Services Professionals. Regardless of the regulatory changes in NYC, a single brand platform for all energy efficiency programs can help unify the information and build more customer awareness on energy efficiency.

New Orleans's primary utility Entergy New Orleans (ENO) provides the city with free building energy assessments and rebates through its Energy Smart Program, focusing only on electric measures.⁶⁵ ENO provides free training to contractors to promote energy efficiency in the market. The Energy Smart Program works in conjunction with NOLA WISE to create a green model for rebuilding New Orleans.⁶⁶ NOLA WISE is a program that offers innovative financing options through low-interest loans with reduced credit requirements so that homeowners can finance energy retrofits without going out of pocket. This is made possible through cooperation with Fidelity Homestead Savings Bank. As a program goal, NOLA WISE seeks to become a one-stop shop for weatherization of existing homes by providing full scale home energy retrofits, offering free ongoing contractor training, and connecting customers to Fidelity to explore their financing options.⁶⁷

⁶³ In addition to NYSHCR's WAP, the New York State Energy Research & Development Agency (NYSERDA) has its own low-income energy efficiency program, EmPower. Moreover, each of the utilities serving NYC has multifamily building energy efficiency programs that provide additional incentives for low-income buildings.

⁶⁴ If gas is used as heating fuel.

⁶⁵ Energy Star http://www.energystar.gov/ia/home_improvement/downloads/awards/POY_Award.pdf?2054-42a1.

⁶⁶ Global Green USA - New Orleans Office. (2015). Energy Efficiency at Home. Retrieved from <http://www.nolawise.org/#!ee-homes/c1np8>.

⁶⁷ Southeast Energy Alliance. (2013). Energy Pro³:Productivity, Progress and Prosperity for the Southeast. Retrieved from <http://www.seealliance.org/wp-content/uploads/SEEA-EnergyPro3-Report.pdf>.



APPENDIX E | Details of REV

The NYPSC commenced the Reforming the Energy Vision⁶⁸ (REV) initiative in 2014 to implement regulatory changes that promote more efficient use of energy, deeper penetration of renewables, and wider deployment of Distributed Energy Resources. REV expects utilities to play a bigger role in the energy efficiency space by creating new energy markets while moving away from traditional resource acquisition programs. However, the plan's ambiguity and short timeline have created unease in the industry and disagreements about what the future will hold. Current interpretations of the regulations could increase the number of programs in the long term and thus necessitate more communication, but in the short term could reduce programs and cause dramatic market contractions and corresponding loss of expertise from the space. Moreover, REV sets a new vision for NYSERDA, utilities, and rate-paying customers.

For **NYSERDA**, REV expects its programs to refocus on market and technology innovation strategies to support self-sustaining markets. Hence, NYSERDA will move away from its customer-facing role and suspend its Multifamily Performance Program, to a role aimed at market transformation at the municipal level. REV envisions that while NYSERDA's market-rate energy efficiency programs would be discontinued, it will continue to provide access to energy efficiency retrofits for low-income customers who may not otherwise benefit from the new markets.

For **utilities**, REV anticipates that their energy efficiency programs will begin to move away from a traditional resource acquisition role. This does away with the EEPS system in favor of integrating funding for energy efficiency directly into a utility's regular business costs. Still, REV is unclear on how these new energy efficiency markets will be developed. And while the end goal of the REV proceedings is total market transformation in which traditional energy efficiency incentive programs no longer exist, it is unclear on what timeline this will be achieved and the mechanism with which utility energy efficiency programs will be phased out. Meanwhile, utilities have not been explicitly directed to take over the market-rate programs that NYSERDA is ending. In total, this leads to extreme confusion and uncertainty in the market over the future of energy efficiency programs in New York.

In the future energy industry envisioned by REV, **customers** are active partners in addressing the challenges and opportunities of the modern electric grid. In order for customers to become more active participants in the market, the PSC hopes to remove the current impediments for customers to be active stakeholders and widespread confusion over programs.⁶⁹

⁶⁸ New York State Department of Public Service. (2015). 14-M-0101: Reforming the Energy Vision (REV). *New York State*. Retrieved April 01, 2015 from:

<http://www3.dps.ny.gov/W/PSCWeb.nsf/All/26BE8A93967E604785257CC40066B91A?OpenDocument>

⁶⁹ Nadel, Steven. (2015). New York's REV: Will the state's new energy plan spur savings or slow progress? ACEEE. Retrieved from <http://aceee.org/blog/2015/03/new-york-s-rev-will-state-s-new>.



APPENDIX F | Background on Public Utilities of NYC

National Grid is an international utility company with services in the U.S. and U.K. They provide electricity to around 3.4 million consumers in New England and upstate New York, and natural gas service to approximately 3.6 million customers in New York City, upstate New York, Massachusetts, Long Island, and Rhode Island.⁷⁰

Consolidated Edison of New York (Con Edison) has been supplying energy to New York for over 180 years. The utility is a subsidiary of Consolidated Edison, Inc., which is one of the biggest investor-owned energy companies in the country. In 2011, Consolidated Edison, Inc., was ranked first on Standard & Poor's Carbon Disclosure Leadership Index, out of 500 utility companies.⁷¹

Public Service Enterprise Group Long Island (PSEG LI) is a subsidiary of Public Service Enterprise Group (PSEG), which operates energy utilities in New Jersey and parts of New York State. PSEG LI took over the operation of Long Island Power Authority from National Grid in 2014.⁷²

⁷⁰ National Grid (2015). Our history. *National Grid*. Retrieved from <http://www2.nationalgrid.com/about-us/our-history/>

⁷¹ Con Edison (2015). About Con Edison. *Consolidated Edison*. Retrieved from <http://www.coned.com/aboutus/>.

⁷² PSEG. (2011). PSEG Long Island, LLC Awarded 10-Year Contract to Manage LIPA Electric Utility System. *PSEG Newsroom*. Retrieved Jan 27, 2015, from: <https://www.pseg.com/info/media/newsreleases/2011/2011-12-15.jsp>.



APPENDIX G | Multifamily Energy Efficiency Incentive Map of NYC

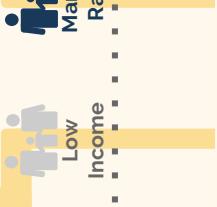
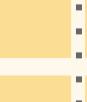
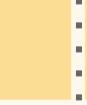
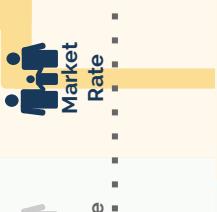
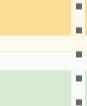
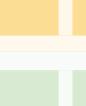
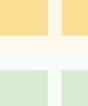
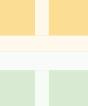
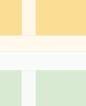
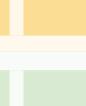
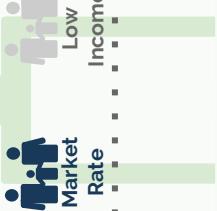
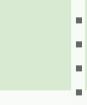
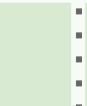
Table G-1: Overview of multifamily energy efficiency programs in NYC

New York City Multifamily Energy Efficiency Program Details				
Program Provider(s)	Program Name	Type of Incentive	Details of Incentive	Marketing Approach
Con Edison	Multifamily Energy Efficiency Program	Direct install and rebates	<ul style="list-style-type: none"> Free energy survey Building owners may receive rebates for eligible upgrades for common area equipment, including lighting fixtures, LED exit signs, HVAC, and building management systems Free "smart" power strips and CFLs and low-flow devices in apartment units 	not available
National Grid	Energy Efficiency Services and Rebates Program	Cash rebates	<ul style="list-style-type: none"> Free energy evaluation and hot water pipe insulation Boilers: \$350-\$560 Boiler reset controls: \$70 Furnaces: \$140-\$420, depending on efficiency Indirect Water Heater: \$210 7 day programmable thermostats: \$18 	Publicized on website
PSEG LI	Far Rockaway - Universal Access	Direct install	<ul style="list-style-type: none"> Appliance replacement including room AC units and refrigerators. New appliances would be Energy Star certified Direct install of efficient lighting for residential building common areas. 	Direct marketing to building owners on Far Rockaways, Queens
New York State Housing and Community Renewal	Weatherization Assistance Program	Direct install	<ul style="list-style-type: none"> Free energy survey Comprehensive, whole building energy efficiency upgrades based off results of energy audit, including but not limited to: <ul style="list-style-type: none"> Sealing of cracks and holes to reduce heat loss; Insulation of attics and walls; Heating system repairs or replacement; Providing efficient lighting and refrigeration; Window and/or outside door repair or replacement; Minor repairs which are needed to ensure maximum efficiency of the weatherization services performed; and Mitigation of energy-related health and safety issues. 	Program services are available to both homeowners and renters, with priority given to senior citizens, families with children, and persons with disabilities.
NYSERDA	EmPower Program	Direct install	<ul style="list-style-type: none"> Household at or below 60% of the average NYS income and living in a building with less than 100 units can sign up a contractor inspect their home. Free installation of high efficiency lighting as needed Free review and adjustment of thermostat setting for maximum comfort and savings Free inspection and adjustment of hot water temperature Free evaluation of need for high efficiency showerheads and aerators, and install if needed Free measurement of energy use of your refrigerators and freezers. May be replaced with new ENERGY STAR models, at no cost. Free check for carbon monoxide and evaluation of need for CO and smoke detectors <p>Depending on energy use contractors may also:</p> <ul style="list-style-type: none"> Evaluate your heating system and conduct a combustion efficiency test Inspect the heating distribution system Assess the insulation levels in the home, Measure the air leakage in the home, using a "blower door" Check for gas leaks if natural gas or propane are in use at the dwelling 	Not available
			<ul style="list-style-type: none"> Requires at least 15% energy reduction Base + performance based incentives 50%+ of heated footage must be residential space Building needs to be benchmarked first by partner Part of it is paid halfway through, remainder upon completion 	Built a partner network - only partners can do the work. Contractors implement marketing efforts as they advise homeowners on energy efficient measures.
	Advanced Sub-metering Program	Direct install and rebates	<ul style="list-style-type: none"> Provides residents more visibility and clear control of their own energy usage Advanced sub-meters: \$250 per meter, up to 50% of cost of system Master meter(s): \$1500 per master meter Refrigerator, ENERGY STAR®: \$250 each In-unit lighting (permanent fixtures): \$25 each 	Publicized on website and brochures



New York City Multifamily Building Energy Efficiency Incentive Map

Multifamily Building renters and owners are eligible for different energy efficiency incentives from various program administrators (government entities and energy utilities) depending on where they live, how big the buildings are, and the type of dwelling.

Location	Number of Units in MF Building	Dwelling type	Program Eligibility	Program Availability					
				Renters	Con Edison Appliance Incentives	Con Edison Multifamily Energy Efficiency Prog	National Grid Multifamily NYsave	PSEG LI Universal Access	NYSERDA Advanced Submetering Prog
Zone 1 (Manhattan, Upper half of Queens, Bronx) Brooklyn, Staten Island) Electricity: Con Edison Gas: Con Edison	 75*			 	 	 	 	 	 
Zone 2 (Lower half of Queens) Brooklyn, Staten Island) Electricity: Con Edison Gas: National Grid	 75*			 	 	 	 	 	 
Zone 3 (Far Rockaways) Electricity: PSEG LI Gas: National Grid	 75*			 	 	 	 	 	 

APPENDIX H | Database of Multifamily Energy Efficiency Programs (Excel)

[Not attached]





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