Optimal ENERGY *Integrated Energy Resources*

Exhibit A

New York State Multifamily Efficiency Opportunities

Prepared for

Energy Efficiency for All

by:

Optimal Energy, Inc.

October 24, 2014

Optimal Energy, Inc.
802-482-5600
www.optenergy.com
10600 Route 116, Suite 3
Hinesburg, VT 05461

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INTRODUCTION

Nationally, the potential for energy savings from multifamily properties is relatively untapped, as documented by multiple studies and reports over the years by a wide range of industry experts.[1] In New York, there are several active efforts to promote more efficient use of energy, including the New York Public Service Commission's "Reforming the Energy Vision" (REV) initiative and New York City's commitment to reducing the City's greenhouse gas emissions by 80 percent over 2005 levels by 2050. Given the frequently underachieved multifamily efficiency potential and the portion of multifamily buildings in the State, special consideration of this sector will likely play a key role in helping New York to reach its energy efficiency goals. This white paper explores energy efficiency in New York's multifamily sector, including the following.

- An estimate of the achievable cost-effective electric and natural gas efficiency potential among multifamily buildings in New York
- Information on the market barriers faced by multifamily building owners and occupants, best practice recommendations for programs to overcome these barriers, and notes regarding the extent to which current multifamily program efforts in New York are implementing these best practices
- Recommendations regarding multifamily sector programs and approaches in New York State

A forthcoming study, also performed by Optimal Energy on behalf of NRDC, will look specifically at the energy savings potential in the subset of affordable housing within the multifamily sector, both in New York and in several other states. Preliminary results from that analysis are used as part of the basis for this paper's estimate of potential for all multifamily housing in the State.

SUMMARY OF FINDINGS

Substantial Potential Exists for Multifamily Efficiency Savings

Our analysis indicates that there is substantial potential for both electric and gas efficiency savings in New York's multifamily buildings. As described below, the potential is over 3,100 GWh and nearly 23 million decatherms[2], or approximately one-quarter of usage in the sector for both electric and gas. This estimate was developed based on consideration of a variety of data and studies relevant to New York's multifamily sector and represents a central tendency or average of results, rather than an upper or lower bound.

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[1] Examples include: The Benningfield Group, "U.S. Multifamily Energy Efficiency Potential By 2020," 2009; The Center for Neighborhood Technology and American Council for an Energy Efficient Economy, "Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities," 2012.

[2] For reference, 1 decatherm = 10 therms = 1MMBtu.

New York is only Capturing a Fraction of This Potential

While many jurisdictions, including New York, have offered efficiency programs targeted towards multifamily buildings, these programs have often failed to reach high levels of participation and fully capture the achievable and cost-effective efficiency potential. This is true in New York, where the present rate of efficiency procurement is far below the rate needed to fully capture all currently achievable cost-effective efficiency. In fact, at current rates it would take over 100 years capture the achievable electric efficiency in its multifamily buildings and 75 years to reach the achievable gas efficiency potential.

New York's Multifamily Programs Should Aggressively Pursue Greater Savings

New York State has an above average proportion of multifamily households compared to the entire U.S., many of whom are low income tenants. Approximately 2.8 million New York households, about one-third of the total, live in buildings with five or more units. With the national average near 25%, this puts New York among the states with the highest multifamily housing stock in the country.[3] In New York City, the concentration of multifamily housing is even more pronounced at approximately 64%. Moreover, much of the multifamily housing stock in the state is affordable housing. For low-income households, home energy costs can account for a significant portion of their monthly expenses. Improving energy efficiency in affordable housing can help provide critical assistance to reduce cost burdens on low-income families and individuals.

Although New York's multifamily programs have established a good foundation, they are falling short of their potential. Based on the analyses presented in this report, NYSERDA and the utilities delivering multifamily programs should pursue far greater savings. At a bare minimum, they should expend their approved budgets and reach the associated savings goals approved by the Public Service Commission through 2015. This would more than double recent electric performance and increase gas performance by 60%. After the end of the approved EEPS II programs in 2015, nearly all of the identified potential will remain. Future programs should strive to reach most or all of the achievable potential identified in this report. For example, reaching the achievable potential over 20 years would not require savings rates beyond those being achieved in leading states. Accelerating the programs to reach the achievable potential within 10 years would place them at the forefront of programs in terms of annual savings rates. Still, these levels of achievement are necessary if New York wishes to meet its aggressive carbon emissions reduction targets.

RECOMMENDATIONS

Based on the above findings, we make the following recommendations for the State's multifamily efficiency efforts.

- Establish multifamily-specific efficiency portfolio goals and budgets to achieve the potential identified in this report over a period of between 10 and

[3] National Average as cited in CNT, ACEEE, "Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities." January 26, 2012.

20 years. This translates to annual electric savings between approximately 159 and 318 GWh and annual gas savings of between 1.1 and 2.3 million decatherms. While this will require substantial investment, on the order of $215 to $430 million per year, the required spending will generate net economic benefits to New York in the form of avoided energy expenditures, improved comfort, regional economic benefits, and reduced environmental impacts.

- Expand the focus on targeting multifamily affordable housing and on recognizing the large additional non-energy societal benefits these efficiency investments provide.
- Coordinate with and support New York City, the New York City Housing Authority, New York State Homes and Community Renewal, and other entities motivated to pursue new efficiency opportunities in the multifamily sector, including efforts to support the success of PlaNYC and "One City Built to Last," which intends to reach a 35% reduction in emissions from New York City buildings in the next ten years.
- Consider undertaking a specific, detailed review of the multifamily sector in the state to better understand program successes, identify specific program strategies and practices to improve achievement, and develop a multi-year strategy for integrated program delivery. Existing programs that have characteristics of "best practice" programs but that have not generated savings commensurate with these characteristics or with their goals would be good initial targets for these efforts.

EFFICIENCY POTENTIAL IN MULTIFAMILY HOUSING

This section presents information and data on the potential energy savings (both electric and natural gas) in the multifamily sector. After a brief review of national estimates, we discuss the results of New York specific studies, and compare these estimates with recent performance of multifamily programs being delivered in New York. Ultimately, our achievable potential estimate is based on a combination of the results from all of the studies described below.

NATIONAL AND OTHER STATE ESTIMATES

Several studies have been completed in recent years to evaluate the energy efficiency potential in multifamily buildings, both in specific jurisdictions and nationwide. General industry evidence shows that comprehensive retrofits should be able to achieve gas efficiency improvements of at least 30% and electric efficiency improvements of 15%. The table below provides a summary of some of these studies. For example, one widely cited study completed by the Benningfield Group in 2009 estimated multifamily efficiency potential by considering findings from 27 regional and state energy efficiency potential studies. This study suggests that nearly 30% of the electric and gas usage in U.S. multifamily housing could be saved through implementing energy efficiency measures. These estimates suggest that there is a large amount of untapped multifamily energy efficiency potential both nationwide and in variety of jurisdictions. From these data we developed average potential estimates for electric and gas to serve as one set of reference values for our overall multifamily achievable potential estimate

Table 1. Achievable Potential from Other Jurisdictions

Author	Title	Date	Timeframe	Jurisdiction	Electric Potential	Gas Potential
The Cadmus Group	Massachusetts Multifamily Market Characterization and Potential Study Volume 1	May 2012	2010- 2030	MA	9%	24%
The Benningfield Group	U.S. Multifamily Energy Efficiency Potential By 2020	Oct 2009	2009-2020	U.S.	28-29% (gas and electric)	
American Council for an Energy Efficient Economy	Potential For Energy Efficiency, Demand Response, And Onsite Solar Energy In Pennsylvania	Apr 2009	2009-2025	PA	17%	46%
Center for Neighborhood Technology and ACEE	Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities	Jan 2012	As of Jan 2012	U.S.	15%	30%
California Home Energy Retrofit Coordinating Committee	Improving California's Multifamily Buildings: Opportunities and Recommendations for Green Retrofit & Rehab Programs	Oct 2010	As of Oct 2010	CA	20% (Built Pre-1980) 15% (Built 1980–2000) 10% (Built 2001–2008)	

NEW YORK-SPECIFIC ESTIMATES

NYSERDA Statewide Potential Study

Optimal Energy has been conducting potential studies for the New York State Energy Research and Development Agency (NYSERDA) since the late 1990s. This includes the 2003 study that was used to develop the New York Energy Efficiency Portfolio Standard and the 15 x 15 goal.[4] In April of 2014, we completed a study to estimate the long-range potential for energy efficiency and renewable energy technologies to displace fossil-fueled electricity in New York.[5] Overall results of the study (i.e., across all sectors) suggest that the achievable potential for energy efficiency savings by 2030, relative to the State's base case energy usage forecasts, is 18% of the electric forecast, 11% of the natural gas forecast, and 20% of the petroleum fuels forecast.

The study examined the potential in residential, commercial, and industrial buildings over the study period. Energy efficiency program portfolios are typically divided into these sectors for implementation, with programs specifically designed to achieve energy savings in each of these markets. The multifamily building market spans both the residential and commercial sectors, complicating both potential estimates and program delivery. Because suitable data for a detailed segmentation of the multifamily market between the residential and commercial sectors were not available, the study did not include a specific estimate of multifamily potential. For purposes of this whitepaper, we used some simplifying assumptions to break out multifamily savings from the potential estimates. Roughly speaking, we believe that multifamily buildings represent approximately 9% of the identified achievable electric potential, 24% of the natural gas potential, and 22% of the petroleum fuels potential. These values were used to develop the second set of reference estimates for the assessment of multifamily potential in this whitepaper.

Forthcoming New York Multifamily Potential Analysis

As noted earlier, Optimal has also recently contracted with NRDC, in conjunction with Elevate Energy, the Energy Foundation, and the National Housing Trust, to undertake an energy efficiency potential study of affordable multifamily housing in eight states, including New York. Because this analysis will be focused specifically on affordable multifamily buildings, it provides a more detailed and robust estimate of achievable potential than the NYSERDA potential study described above. On the other hand, because it will be limited to affordable multifamily units, the results may not be exactly comparable to the potential in all multifamily units.[6] Nevertheless, we use the preliminary results from this forthcoming study as

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[4] "Energy and Efficiency Renewable Energy Resource Development Potential in New York," 2003. https://www.nyserda.ny.gov/-/media/Files/EDPPP/Energy-Prices/Current-Outlook/Presentations/energy-efficiency-renewble-energy-resource-development-potential.pdf

[5] "Energy Efficiency and Renewable Energy Potential Study of New York," 2014. https://www.nyserda.ny.gov/Energy-Data-and-Prices-Planning-and-Policy/Energy-Prices-Data-and-Reports/EA-Reports-and-Studies/EERE-Potential-Studies.aspx

[6] For purposes of this study, affordable is defined as households having less than 80% of the Area Median Income.

the third set of reference values. These are a 20-year maximum achievable electric savings potential of 35.4% and a gas potential of 18.5%.

An important caveat is worth noting with respect to the gas potential in particular. As with most potential estimates, the study includes only those measures that are economic, meaning that they pass the Total Resource cost-effectiveness test. Yet, there are likely substantial additional savings opportunities over the analysis horizon from measures that are not currently economic. While this is true across all end-uses, sectors, and technologies, we believe it plays a particularly substantial role with respect to older, inefficient central boiler systems such as are found in multi-family buildings. These are typically not cost-effective to replace before the end of their useful lives. Although the analysis does capture the savings from replacing these units with high efficiency units when they are retired, those savings are only calculated as the difference between a high-efficiency unit and a code-compliant unit. To the extent that the existing unit's efficiency was below current codes (and some units are clearly far below current code), customers will see larger reductions in usage than are "claimed" as part of this potential study.

ACHIEVABLE POTENTIAL ESTIMATE

The discussion above presents several estimates of achievable potential derived from a variety of New York and non-New York sources. As shown in the table below, these studies present a range of potential for both electric and gas, although all of them demonstrate substantial potential far in excess of current savings trajectories. We calculate the achievable potential estimate by averaging all of these sources. This provides a robust, supportable value that minimizes the effects of any biases or limitations of any one study, whether as a result of data, methodology, or vintage of the study.

Table 2. Summary of Achievable Potential Estimates for New York Multifamily Buildings

	Electric		Gas	
	GWh	% of Usage	Million Decatherms	% of Usage
Average of non-NY Studies	2,026	17%	27	29%
OEI NYSERDA study (20 years)	3,270	27%	25	27%
NRDC MF Multi-state study (NY) (20 years)	4,243	35%	17	19%
Achievable Potential Estimate (10-20 years)	**3,179**	**27%**	**23**	**25%**

COMPARISON BETWEEN CURRENT SAVINGS AND ACHIEVABLE POTENTIAL

As shown in Table 3 below, actual electric savings in 2012 and 2013 from efficiency program efforts in New York represent approximately 1.9% of our achievable electric potential estimate, or less than 1% of the potential each year. Using this savings rate as a general estimate of performance going forward, it would take over 100 years to reach achievable multifamily savings levels. On the gas side, 2012 and 2013 results represent only about 2.7% of the achievable potential, putting the achievable potential 75 years distant. Clearly, current efforts

are insufficient to acquire a significant portion of cost-effective savings in any reasonable timeframe. To reach all achievable electric savings in 20 years, current efforts in New York would need to increase fivefold, and gas programs nearly fourfold.

Table 3. 2012 and 2013 New York Multifamily Electric Savings[7]

Utility	Target (GWh)	Actual (GWh)
ConEd	17	29
NYSERDA	125	9
NYSG	2	5
NIMO	11	13
RG&E	2	4
Total	**157**	**61**
% of Achievable Potential Estimate		***1.9%****

***The percent of achievable potential is only presented as a statewide total because potential was not estimated by individual utility/Program Administrator.**

Table 4. 2012 and 2013 New York Multifamily Gas Savings[8]

Utility	Target (Dth)	Actual (Dth)
ConEd	295,824	339,515
NYSERDA	550,662	171,093
NIMO	31,752	55,836
KDLI	15,840	8,636
KDNY	93,080	32,271
Total	**987,158**	**607,352**
% of Achievable Potential Estimate		***2.7%****

***The percent of achievable potential is only presented as a statewide total because potential was not estimated by individual utility/Program Administrator.**

[7] Savings data from New York Energy Efficiency Portfolio Standard Reports: http://documents.dps.ny.gov/public/EEPS/EEPSReport.aspx

[8] Savings data from New York Energy Efficiency Portfolio Standard Reports: http://documents.dps.ny.gov/public/EEPS/EEPSReport.aspx

GOALS FOR MULTIFAMILY EFFICIENCY IN NEW YORK

Tables 3 and 4 show that recent multifamily program performance is well behind target, with electric programs achieving only 39% of target savings for 2012 and 2013. Gas programs are faring a little better, achieving 62%. At a minimum, the state should reach the targets for multifamily programs approved in EEPS II through 2015.

After the end of the approved EEPS II programs in 2015, substantial potential will remain. Future programs should strive to reach most or all of the achievable potential identified in this report over a period of between 10 and 20 years. This translates to annual electric savings between approximately 159 and 318 GWh and annual gas savings of between 1.1 and 2.3 million decatherms. This will require substantial investment, on the order of $215 to $430 million per year, in total, across electric and gas efforts.

Table 5. New York Multifamily Recommended Savings Goals and Budgets

	Electric		Gas	
	Over 10 years	Over 20 years	Over 10 years	Over 20 years
Recommended Annual Average Savings	318 GWh	159 GWh	2 million decatherms	1 million decatherms
Recommended Annual Average Budget	$251 million	$126 million	$178 million	$89 million

This savings rates required to reach the achievable potential in 20 years, roughly 1.3% savings per year for electric and 1.2% per year for gas, are not beyond the achievements in leading states, although it does represent a substantial increase over current multifamily program activity in New York. While we have not estimated a "ramp up" trajectory for these savings, we note that other programs have substantially increased savings in a relatively short amount of time. For example, electric program savings in Massachusetts have increased from 1.3% of sales in 2010 to 2.3% in 2013, with planned 2014 savings of 2.6%. Savings in the low-income sector, traditionally harder to achieve than in non-income eligible residential or commercial sectors, have increased from 1.1% to 1.8% per year over a similar timeframe, which is particularly relevant to the multifamily and low-income sectors in New York. Gas program savings have ranged from 0.6% to 1.2% per year in Massachusetts, although savings in the low-income sector reached 2% in 2012 and 2013.[9] Other efficiency program administrators in Vermont, Rhode Island, and Connecticut are achieving overall electric savings of between 1.2% and 2.1% per year and gas savings between 0.4% and 1.9% per year. These results indicate that savings well in excess of current achievement are feasible. In the near term, aiming for sustained electric savings of 1.5% per year and gas savings of 1.0% per year in New York's multifamily buildings over the five-year period from 2016 through 2020 would result in acquiring nearly one-third of the achievable electric potential and one-fifth of the gas potential. This would put New York on a trajectory to make substantial progress in acquiring the full achievable potential in a reasonable timeframe and thus contribute to the state's climate goals.

[9] Unfortunately, data on the usage of multifamily buildings energy sales in Massachusetts are not available, so it is difficult to estimate the percent savings specifically in multifamily programs.

We estimated the annual cost to acquire the potential savings by assuming that recent acquisition costs of NYSERDA's multifamily programs are a conservative (i.e., likely to be on the high end) forecast of overall savings costs. Based on data from 2012 and 2013, NYSERDA's costs for both electric and gas savings were higher than those of all of the IOU programs. If current average state-wide acquisition costs are more reflective of future costs, the estimates in the table above would be approximately 40% lower. On the other hand, efforts to specifically address affordable multifamily units may require greater investment that the average costs to date. The forthcoming multi-state affordable multifamily potential study will address costs in that sector in more detail.

OVERCOMING BARRIERS TO EFFICIENCY IN MULTIFAMILY BUILDINGS

The difficulty in achieving deep multifamily savings is largely the result of a number of challenges and institutional practices prevalent in the sector: unique barriers faced by landlords and tenants; a "balkanized" approach to efficiency that has generally customized programs either for the single family residential market or for commercial and industrial facilities; and, particular to New York, the policy of limiting utility-sponsored multifamily programs to buildings with between 5 and 50 or 75 units (depending on the program). Because of the unique barriers, specific technical opportunities, and mixed use occupancy and bilateral decision-making authority in multifamily buildings, many policies and programs have failed to aggressively and effectively pursue the large and cost-effective efficiency opportunities that exist in this sector.

This section describes some of the key barriers to efficiency investment in multifamily buildings. Some of these are similar to barriers that exist for all customers regardless of sector, while others are more specific to multifamily buildings, owners, and occupants. For each barrier, we present information on some of the "best practice" approaches used to overcome the barrier. To the extent that information was available, we also describe how, if at all, the current multifamily programs in New York are addressing these barriers.

There are two primary types of multifamily programs currently operating, one offered by NYSERDA and the other by several of the state's utilities. NYSERDA's Multifamily Performance Program (MPP) takes a performance-based approach to providing incentives for multifamily efficiency projects and requires that participants agree to implement an Energy Reduction Plan projected to achieve at least 15% energy savings in order to access incentives for the project. The program also provides benchmarking and technical assistance to participating customers. Several utilities including Con Edison, National Grid, NYSEG, and Rochester Gas & Electric also offer multifamily programs to customers in their service territories. As required by the NY Public Service Commission, these utility-sponsored programs are limited to multifamily buildings under 75 units and offer prescriptive incentives for eligible efficiency measures, as well as energy surveys, free installation of low-cost in-unit measures, and technical assistance.

MARKET SEGMENT VARIABILITY

Multifamily buildings are typically defined as those with five or more units. However, a 150-unit high rise apartment building and a 5-unit townhouse style structure are likely to differ significantly along a range of structural and system characteristics such as the type of HVAC system and meter configuration. Moreover, the multifamily market may sometimes be classified as commercial and sometimes as residential, depending on the jurisdiction and utility rate classification systems. Many multifamily buildings include a range of energy uses, including in-unit residential appliances and plug-loads, large commercial-scale central energy systems, and even commercial or institutional tenants on ground floors. Many efficiency programs, including those in New York, are "siloed" based on these different segments. As a result, it is difficult for multifamily building owners or property management firms to develop and implement a comprehensive plan to pursue energy efficiency upgrades to all of their buildings and all of the

individual systems within those buildings. Property owners seeking to reduce energy use through the support of efficiency programs often have to work through multiple programs or program administrators to address all savings opportunities in the building or, more importantly, have been prevented from combining program offerings in one project. Designating multifamily buildings, regardless of size, as a single sector can result in programs that are specifically tailored to meet the needs of this market.

Providing multiple approaches that together reach the diverse building stock and needs of the multifamily sector can help to capture all achievable savings. For example, whole building approaches to multifamily buildings are often described as a best practice for maximizing savings. Whole building approaches consider savings opportunities in all systems and equipment including heating, cooling, and ventilation as well as appliances, lighting, and other plug loads. This whole building approach, addressing both the common area and individual living unit opportunities, allows owners to achieve deeper levels of savings by implementing a systems-thinking approach to energy use and efficiency upgrades. In addition, permitting a comprehensive "Energy Management Plan" strategy that allows owners of large portfolios of multifamily buildings to phase the work in one building as they implement single measures throughout their entire portfolio has also been demonstrated as a "best practice" and has led to the achievement of large savings in some utility programs. Programs that target measure-specific savings opportunities enable property owners who are unable or unwilling to address all measures in a single building at one time to achieve some savings immediately and to scale up total savings by completing additional measures over time. Developing an "Energy Management Plan" for an entire portfolio of buildings and conducting whole building assessments on each property to identify and plan to address opportunities throughout the building owner's portfolio over time has been adopted by some large property management firms.

Although a whole building approach is frequently cited in the best practice literature, it is important to note that the comprehensive Energy Master Plan approach has also long been identified as a best practice among large property management firms nationally. Both performance-base and prescriptive programs can be effective options to achieve significant savings in the multifamily sector. What is most important is to ensure that the appropriate level of service is available to each customer and that enough information is available to allow them to make an informed decision about the best approach.

NYSERDA's MPP is based on the whole building approach. Current utility-offered programs provide cost effective opportunities when a whole-building project is not appropriate or feasible. While the current programs seem to be oriented towards best practices, there are several other barriers at work in the sector, as described further below. More importantly, the MPP program has not, to date, been able to deliver substantial savings; NYSERDA's recent achievement is well below goal. As we note in our recommendations, the MPP would seem to be a ripe target for further research into how to maximize the savings generated by the existing program structures.

SPLIT INCENTIVES

Much of the multifamily building stock is rental property, which creates misaligned or "split" incentives for investing in efficiency. Typically, upgrading the efficiency of a current building or utilizing energy efficient building practices requires the owner of the building to make an initial capital investment. Yet in the residential sector, approximately 80% of renters are responsible for paying their own utility costs.[10] Therefore, tenants receive the benefits from the landlord's investment in the form of reduced energy bills. Because the building owners will not receive all of the direct financial benefits in exchange for the upfront costs, there is less incentive for them to make the investment in energy efficiency.[11]

This can be addressed through a number of program and policy options. Rebates reduce the cost of efficiency investments by providing a financial incentive to building owners to implement efficiency measures. On-bill financing programs allow customers to repay loans for investments in energy efficiency on their monthly utility bills. Often, loans are tied to meters and are connected with the property rather than the customer. Through a green lease, a tenant and landlord would enter into a cost-sharing agreement. The lease would indicate an additional rent amount to be paid by the tenant in order to help cover the landlord's investment in energy efficiency. While this concept has not been widely applied to the residential sector, it could serve as a potential financing tool to address the split incentive problem. An important component of this applying this tool to affordable multifamily units is to provide some guarantee of savings in order to offset the financial risk associated with relying on future energy bill savings to successfully repay the loans.

While rebates are currently offered through both NYSERDA and utility programs in New York, additional program strategies designed to specifically address the split-incentive program may provide opportunities for additional multifamily savings. For example, rebate levels may need to be adjusted to cover more of the incremental cost between conventional and efficiency systems and equipment in order to better address issues of split incentives. These higher rebates should only be offered where the split incentive barrier actually exists, rather than to all customers or even to all multifamily units.

COST AND FINANCING BARRIERS

Even when property owners would like to invest in efficiency, the up-front costs required to make efficiency improvements often represent an additional barrier. To address the higher initial costs associated with efficiency projects, best practice programs may provide financing in addition to incentive payments for multifamily efficiency projects. Not only do financing opportunities provide access to capital, but they also provide appealing terms for repayment that act as an incentive for borrowers. Such financing options may include low-interest rate loans, loans that coincide with the payback of efficiency projects, or on-bill financing. Programs

[10] Harvard Joint Center for Housing Studies. "America's Rental Housing: Meeting Challenges, Building on Opportunities." 2011.

[11] In the long term, improved efficiency can make rental units more valuable and potentially increase rents and decrease tenant turnover. However, these benefits are often not understood or fully valued by landlords.

directed at identifying potential projects and project owners at time of refinancing or sale could accelerate adoption of efficiency in multifamily buildings. Timing of efficiency upgrades can be crucial because there are more opportunities when a property is being purchased or refinanced than when an owner must take on new debt expressly for efficiency projects.

NYSERDA currently offers financing for multifamily energy upgrades through Green Jobs – Green NY (GJGNY). GJGNY is a statewide program that is intended to strengthen communities by supporting sustainable community development and creating green jobs. The GJGNY multifamily loan program provides 50% of the principal borrowed directly to the customers' lender at an interest rate of 0% to a maximum of $5,000 per unit or $500,000 per project. As of June 2012, only one multifamily participant had accessed financing through NYSERDA.[12] While it is possible that larger properties had access to other sources of financing, better marketing and promotion of financing options could raise awareness of multifamily financing options and increase participation.

The New York Energy Efficiency Corporation has developed a loan program for participants in the Con Edison Multifamily Energy Efficiency Program, but, generally, the prescriptive programs currently offered by New York's Investor Owned Utilities do not offer financing options to customers participating in multifamily programs. It is possible that additional financing opportunities, particularly for smaller multifamily customers could help to encourage more property owners to make efficiency upgrades. This should be further explored to be added as a design element of the prescriptive multifamily programs.

LACK OF USAGE DATA

Lack of data about multifamily building energy use can also hinder efficiency efforts in the multifamily sector. To address this barrier, multifamily efficiency programs should strive to provide access to data on aggregate building usage. Benchmarking tools provide useful information that enables building owners to identify savings opportunities and make decisions about investments in energy efficiency. There are several platforms developed to support the benchmarking process. The U.S. EPA's Energy Star Portfolio Manager, for example, is a free tool used by numerous commercial building owners and operators to benchmark their portfolios and is preferred by many local jurisdictions. Other proprietary tools such as EnergyScoreCard and WegoWise are designed specifically for benchmarking in the multifamily sector. In New York, Local Law 84 requires benchmarking of energy use in large buildings, including multifamily structures. This large, concerted effort to aggregate building use date is limited to the City and not implemented on a wide scale in other parts of the State.

Approximately nine municipalities, including New York City, have implemented benchmarking mandates for large buildings (typically those over 50,000 square feet) that require building owners to report and track building energy use.[13] Of these nine municipalities, six require benchmarking for multifamily buildings. In New York City, the importance of data collected from benchmarking has been reflected in Local Laws 84. In general, this law requires

[12] *Ibid.*

[13] http://urbanland.uli.org/sustainability/tracking-energy-use-multifamily-buildings/

public buildings exceeding 10,000 square feet and private buildings exceeding 50,000 square feet to submit annual benchmarking data in order to track and optimize building energy performance. [14, 15]

A 2012 report indicated that two-thirds of the 2.6 billion square feet covered under the regulation had been benchmarked. Multifamily buildings made up the majority of the data set, accounting for 63% of the square footage that have been benchmarked. This data will provide invaluable information for understanding energy use and efficiency opportunities among various building types, including multifamily buildings. While this large, concerted effort to aggregate building use date is limited to the City and not implemented on a wide scale in other parts of the State, NYSERDA's MPP tracks and provides data through both benchmarking and evaluation efforts.

LACK OF KNOWLEDGE AND HIGH TRANSACTION COSTS

In order for property owners to upgrade their current building stock or build more efficient housing, they must seek out information to weigh their options and commission professionals to complete the work. Such actions require time and effort above and beyond what they would likely undertake to maintain the status quo with their building management.

To overcome the transaction costs associated with implementing efficiency projects, programs should attempt to offer customers a "One-Stop Shopping" experience. Customers should be able to work through one program and point of contact to address all energy savings opportunities in the building. This includes opportunities in both common areas and individual units as well as both gas and electric savings measures. This point of contact should act as a central source of information and support all phases of the project from planning to completion. If contractors need to be hired to complete the work, programs can provide a list of approved vendors that have been prescreened and trained to ensure quality work. Addressing all opportunities at once helps to maximize savings and reduce customer time and effort.

NYSERDA' MPP provides a "one-stop shop" by offering a list of partners that can support the customer throughout the duration of the project. The utility programs provide similar services to customers that address both common areas and unit savings opportunities. Customers may find the utilities' prescriptive approach more straightforward and appealing for its simplicity or for financial reasons. However, the size of the eligible buildings in utility programs are limited by current Public Service Commission requirements. As a result, utilities are unable to provide opportunities for the largest buildings that represent large savings opportunities. This is particularly a problem in New York City, where buildings greater than 50

[14] Explicitly, the laws requires buildings exceeding 50,000 gross square feet, two or more buildings on the same tax lot that together exceed 100,000 gross square feet, or two or more buildings held in the condominium form of ownership that are governed by the same board of managers and that together exceed 100,000 gross square feet to comply with the requirements.

[15] PlaNYC, "About LL84." <http://www.nyc.gov/html/gbee/html/plan/ll84_about.shtml>. Accessed June 13, 2013.

units represent 55% of the total multifamily housing units.[16] This arbitrary restriction could be removed, paving the way to larger participation in programs and greater savings.

There may be opportunities to improve the coordination between NYSERDA and utility efficiency programs in New York. Currently, buildings that fall into the 5 to 50 or 5 to 75 unit category (depending on utility) can participate in either NYSERDA's program or a program that might be offered by their local utility. Although NYSERDA's website references the additional utility programs, it does not provide much guidance as to which option may be preferable to customers; some utility program providers offer advice on both programs. While both program approaches can provide customer and efficiency benefits, a process to effectively communicate to owners the pros and cons of each option should be available in every instance. More complete integration and coordination between available services would be a further step towards a true one-stop-shopping experience. At a minimum, some guidance documentation could inform customers about their options and criteria for selecting the best program. This would help customers make a more informed decision about program participation. Better collaboration between NYSERDA and the utility programs would also help to alleviate confusion and effort required to select a program. One efficiency point of contact for all multifamily customers may be desirable. Additionally, vendors and trade allies charged with delivering the program need to have a clear understanding of which multifamily profiles best fit prescriptive or performance options, and target and conduct outreach and sales accordingly.

In summary, the current basic designs of New York policy and programs already feature some important core elements addressing some if not all of the challenges above. Further, national best practice efforts are showing significant positive results. We recommend that current multifamily programs be examined for successes and failures and areas for expansion and study be identified. It is clear, however, that even short-term significant increases in multifamily building budgets would be reasonable to increase savings achievement in the sector.

[16] 2012 American Community Survey 5-year estimates, Table B25024 Units in Structure

CONCLUSION AND RECOMMENDATIONS

As documented above, a significant amount of achievable and cost-effective energy efficiency potential exists in the multifamily building sector. In New York, this potential is especially important given the disproportionately large amount of multifamily housing units in the State and the large amount of low income multifamily tenants. While the efficiency programs currently offered in New York have made progress towards improving multifamily building efficiency and incorporate many of the best practice program recommendations, these programs have only just begun to capture the achievable efficiency potential. Furthermore, under a "business as usual" approach, New York will never be able to fully capture the achievable potential given the current relatively slow rate of efficiency resource acquisition. In order to remedy this, the PSC should establish much more aggressive goals and budgets for multifamily program savings throughout the State. The PSC and NYSERDA should also work closely with New York City and the New York Housing Authority to develop programs and policies to encourage capture of all cost-effective efficiency opportunities in a timely and effective manner.

In addition to significantly expanding New York's investment in multifamily building efficiency, it is important that the PSC continue to establish discrete and specific multifamily savings goals and budgets. Residential programs are predominantly focused on opportunities in the single-family home market while C&I programs are designed to capture opportunities typically found in common commercial facilities such as offices and retail establishments. Because multifamily buildings span many of the unique features and barriers of both residential and C&I sectors, unique initiatives are needed to effectively provide customized strategies for this market.

Finally, better coordination should exist between the PSC, NYSERDA, the utilities, the state authorities, and New York City to minimize customer confusion and ensure that a comprehensive set of services are available to all multifamily building owners and occupants. These services should be coordinated to provide "one-stop shopping" for landlords and tenants.

Several steps could be taken in New York to help close the gap between achievable and actual multifamily savings.

- First and foremost, multifamily buildings should be treated as a distinct market sector, with the appropriate level of potential assessment and associated budgets to capture savings as quickly as possible. The State should accelerate projects under the current EEPS II and commit to obtaining a meaningful portion of the potential in the five years after completion of EEPS II. This will require an increase in budgets, which could go specifically towards expansion of existing programs and approaches that are successful and represent best practice towards overcoming sector barriers.
- In the short-term, the core components of the current program designs could be accelerated and enhanced while new approaches and policies are added to

maximize success. Currently, both performance-based and prescriptive program approaches are implemented in New York, meeting a range of building and occupant needs and opportunities. While both designs have their merits and both have room for enhancement along the lines of best-practice adoption, their successful integration is a critical objective. Either approach could apply to any specific building and are both available to customers, but properly identifying the best approach for a given building is critical. Assuring that the property owner and/or residents have sufficient information to choose is a key component of this. There may be an opportunity to improve program delivery by developing a better understanding of the current extent of integration between program offerings and whether or not sufficient information about the appropriateness of various approaches is being provided to customers. Such an understanding could identify steps that would facilitate greater savings from the current framework of programs.

- In conjunction with the above, efforts to understand current program success and areas needing improvement should be used to generate the best possible results from existing programs, which to date have fallen short of their goals.
- From a policy perspective, expanding benchmarking efforts statewide would help to provide useful information to building owners related to efficiency opportunities and progress towards achieving goals.