

**Multifamily Performance Program
Program Logic Model Report**

Final Report

Prepared for

**The New York State
Energy Research and Development Authority**

Prepared by

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New York State Energy Research and Development Authority
System Benefit Charge
Multifamily Performance Program (MPP)
LOGIC MODEL REPORT
(JANUARY 27, 2011)

INTRODUCTION

This report identifies and documents key elements (inputs, market actors, barriers, goals, activities, outputs, outcomes, potential external influences and researchable issues) associated with the New York State Research and Development Authority's (NYSERDA's) Multifamily Performance Program (MPP). This logic model addresses NYSEDA's multifamily activities occurring as a result of Energy Efficiency Portfolio Standard (EEPS) electric and gas funding. In addition, for contextual purposes only, references to other related activities and associated funding sources may also be presented.

This document provides:

- 1) A table showing a list of documents reviewed that relate to NYSEDA's Multifamily Performance Program (including Existing Buildings and New Construction) used to provide insights during development of this program logic model report;
- 2) A high level summary of the context of the markets within which this program operates, including funding that the Multifamily Performance Program (MPP) receives through the New York State Public Service Commission (the Commission) EEPS Program, and other potential complimentary and competing programs. Available market characterization information is also presented in this section including a description of baseline conditions, technical energy and demand reduction potential, and the portion of the potential that the program is expected to achieve;
- 3) Key program-specific elements including market barriers and associated market actors, program activities, inputs, anticipated outputs and outcomes (goals) and potential external influences, information on how program activities are expected to change the behavior of market actors is also presented in this section;
- 4) A Program Logic Model (PLM) diagram showing the linkages among program activities, outputs and outcomes, and identifying inputs and potential external influences;
- 5) A table listing the key outputs and outcomes, including identification of relevant measurement indicators and potential data collection approaches to guide later prioritization, and development of a monitoring and evaluation plan; and
- 6) A list of potential researchable issues for consideration within evaluation planning.

Section 1: RELATED NYSERDA DOCUMENTS

Table 1 identifies NYSERDA and other potentially relevant documents that were reviewed for this report.

Table 1. Relevant Documents Reviewed

NYSERDA Document Description
CASE 07-M-0548, <i>Order On Rehearing Denying In Part and Granting In Part Petition For Reconsideration, Rebalancing Order Issued and Effective June 21, 2010</i>
CASE 08-E-1132, CASE 07-M-0548, <i>Order On Rehearing Denying In Part and Granting In Part Petition For Rehearing, issued and Effective December 23, 2009</i>
Megdal & Associates, LLC, <i>Multifamily Performance Program Refrigerator Measurement and Verification Plan</i> . Prepared for NYSERDA, February 22, 2010.
New York City Rent Guidelines Board, <i>2010 Housing Supply Report</i> , June 3, 2010.
<i>New York Energy \$martSM Program Evaluation and Status Report</i> , Year Ending December 31, 2008. Final Report to the Public Service Commission March 2009, Section 4.5.
<i>New York's System Benefit Charge Programs Evaluation and Status Report</i> , Year Ending December 31, 2009. Final Report to the Public Service Commission March 2010.
<i>NYSERDA EEPS Program Administrator Proposal – Revised May 19, 2009</i> . MSWord document title: <i>NYSERDA Multi-Family 90-Day UPDATE FINAL DRAFT 7-30-09</i> . Section 2
NYSERDA's Multifamily Performance Program: Con Edison Territory Multifamily Market Characterization Study. December 2008.
NYSERDA's Multifamily Performance Program Website : http://www.getenergysmart.org/MultiFamilyHomes/Default.aspx
NYSERDA, <i>Supplemental Revision to SBC Operating Plan for Multifamily Performance Program (MPP) (electric and gas)</i> , August 31, 2010.
NYSERDA, <i>Supplemental Revision to SBC Operating Plan for Multifamily Performance Program (MPP)</i> , February 22, 2010.
NYSERDA, <i>Supplemental Revision to SBC Operating Plan. Section 4.2 Geothermal Heat Pump Systems Incentives</i> , December 1, 2009.
NYSERDA, <i>Supplemental Revision to SBC Operating Plan. Section 4.3 Electric Reduction in Master-Metered Multifamily Buildings</i> , December 23, 2009.
Residential Loan Fund Website : http://www.nyserda.org/loanfund/default.asp
Research Into Action, Inc., <i>Multifamily Building Performance Program Process Evaluation Report</i> , Prepared for NYSERDA, April 2008.
State of New York Public Service Commission. Order Approving Electric Energy Efficiency Programs with Modifications. CASE 08-E-1132. Issued and Effective June 24, 2009.
State of New York Public Service Commission. Press Release: Multifamily Program. July 24, 2009.
Summit Blue Consulting, LLC, <i>New York Home Performance with ENERGY STAR[®] Program Market Characterization and Market Assessment Evaluation Final Report</i> , Prepared for NYSERDA, February 2009.

Section 2: CONTEXT AND PROGRAM DESCRIPTION

2.1 Description of Current MPP EEPS Program¹

NYSERDA's Multifamily Performance Program (MPP) is one of a number of initiatives being implemented as part of NYSERDA's **New York Energy \$martSM** portfolio of programs. MPP is designed to address the needs of the multifamily sector through working with developers, building owners and representatives to improve the energy-efficiency of buildings with five (5) or more residential units (located in the NYSERDA-managed system benefit charge (SBC) territory) in a cost effective manner. The MPP consists of a *New Construction Component* and an *Existing Buildings Component*, serving all combinations of market-rate and low-to-moderate-income projects using a common process and a varying schedule of incentives.

Beginning July 1, 2010, MPP will fund only cost-effective measures that meet the Total Resource Cost (TRC) Test². Both individual measures and whole projects are required to pass the TRC Test in order to receive EEPS electric and gas funding. Only measures with a TRC value of 1.0 or greater are eligible to receive EEPS incentives. For this program, NYSERDA and DPS staff worked in tandem to develop a tool that facilitates a TRC analysis of thermodynamic modeling outputs and cost assumptions at both the measure and project level in order to qualify measures and projects for incentives. To receive incentives, each project must compile a scope of work (in the form of an Energy Reduction Plan) that results in a total resource energy savings within the multifamily building of at least 15% when compared against a calculated energy usage benchmark.

MPP relies on a network of energy consulting firms to assist building owners in determining the most cost-effective measures that can be installed to help reduce energy use. Once qualified through the program, these Multifamily Performance Partners ("Partners")³ provide a minimum suite of technical and administrative services to program participants including application submission, facilitation of a project scoping session and site visit, benchmarking, energy auditing, energy modeling, development of an Energy Reduction Plan, execution of contract documents and invoices, and inspecting proper installation of agreed-upon and required energy-saving measures.

MPP Partners use the Program's benchmarking tools, Energy Reduction Plan templates and various auditing software packages to determine what measures are cost effective, expected energy savings and the costs to install the measures. The Energy Reduction Plans identify the measures needed to reduce the energy use by at least 15% and include broad-based information about project timelines and proposed financing strategies. NYSERDA provides incentives (per unit for existing buildings and per square foot for new construction) to the building owner for measure installation. The incentive is paid in installments throughout the course of the project in accordance with the program's incentive schedule. The milestones for new construction projects and existing buildings projects are similar in concept, but functionally different due to the nature of the different construction milestones.

The *New Construction Component* supports new construction and gut rehabilitation projects by providing technical and financial assistance to improve the energy efficiency in the planning, design, and

¹ This section presents the program as it complies with the directives of the July 26, 2009 *Order Approving Multifamily Energy Efficiency Programs with Modifications*, as modified in the December 23, 2009 Order and NYSERDA's, *Supplemental Revision to SBC Operating Plan for Multifamily Performance Program (MPP) (electric and gas)*, August 31, 2010

² The program began accepting applications on September 23, 2010. Other measures will be funded by the owner, or through other funding sources developed by NYSERDA.

³ Program participants must select a Partner from the program's network of Partners, who are chosen to offer services for the program by a review panel consisting of staff from NYSERDA, DPS, and NYSERDA's MPP implementation contractor. Partners provide services to the participants, such as developing a list of cost-effective energy efficiency measures that a building owner can implement, and developing a financing plan that identifies funding to complete the work scope.

construction phases of each project. This allows participants to use either a prescriptive set of measures approved by US EPA to achieve an as-built product that meets ENERGY STAR[®] standards, or a set of modeling and design protocols that lead a multifamily project to achieve a predetermined energy performance target of 15%.⁴ If the 15% target is pursued, an Energy Reduction Plan must be developed to evidence achievement of the energy performance target. Developing the Energy Reduction Plan, completing the measures identified in the Plan, and confirming that the performance target has been achieved entitles participants to NYSERDA incentives and, if the project achieves a 15%⁵ performance target, may entitle the building owner to receive an ENERGY STAR[®] performance indicator provided by the EPA.

The *Existing Buildings Component* supports existing multifamily buildings by offering assistance to improve the energy efficiency of buildings. This component requires that the participant benchmark the current energy performance of the existing facility against a set of similar buildings using the Program's Benchmarking Tool.⁶ An Energy Reduction Plan must be developed to identify the chosen measures that will reduce energy use of the building by 15%. Developing an Energy Reduction Plan and installing the improvements identified in that Plan may entitle the building owner to receive the **New York Energy \$martSM** Building designation.

By providing only two program tracks and consolidating several previous multifamily initiatives, the EEPS Multifamily Performance Program addresses many common market barriers and provides "one-stop shopping", allowing both multifamily new construction and existing building owners and developers to find appropriate NYSERDA services more easily. Additionally, similar to NYSERDA's Single Family Home Performance Program, a dedicated effort has been made to consolidate and expand the various training and educational activities by establishing a single entity or institute that focuses on workforce development.

As a market transformation program, MPP places emphasis on making permanent changes in the way multifamily buildings are constructed and maintained. As proficiency and capacity increase, there will be opportunities to impact building codes, raise the bar on energy performance, and encourage more stringent energy efficiency requirements for new and existing multifamily buildings across the State. In addition, as building owners and managers experience the benefits of properly trained and certified building and systems technicians, demand for training resources and programs will grow. All multifamily building program components, both existing and new serving both market-rate and low-to-moderate-income buildings, are implemented by a single, competitively-selected contractor.⁷

2.1.1 EEPS Funding and MPP Geothermal Incentives

On June 23, 2008, the Commission created an Energy Efficiency Portfolio Standard (EEPS) program for New York State to develop and encourage cost-effective energy efficiency programs in and effort to

⁴ The 15% performance target is defined as a 15% decrease in overall energy intensity, measured on a cost basis, relative to a reference model designed to meet ASHRAE 90.1-2007.

⁵ Currently, the ENERGY STAR label for high-rise multifamily buildings is given to buildings that demonstrate a 15% decrease in overall energy intensity, measured on a cost basis, relative to a reference model designed to meet ASHRAE 90.1-2004.

⁶ The benchmarking tool provides a benchmarking score that compares each building's performance to a data set of buildings across the country. In addition, the Energy Reduction Plan expresses the proposed end-use energy savings for each energy efficiency measure as a percentage of total source energy consumption. It is this expression that qualifies projects by providing an energy savings threshold above which all projects must perform in order to be eligible for incentives. The 15% target is essential to focus program participants on implementing meaningful whole-building work scopes. It also promotes the public benefits of reduced generation and associated emissions by tying incentives to total source energy reductions.

⁷ *New York's System Benefit Charge Programs Evaluation and Status Report*, Year Ending December 31, 2009. Final Report to the Public Service Commission March 2010, page 5.8.

achieve a 15% reduction in energy usage statewide by the year 2015.⁸ The Commission initially invited NYSERDA and the six large investor-owned electric utilities to submit electric energy efficiency program proposals. Numerous program proposals were submitted in response to the Commission's invitation. Many of the proposals were in the form of combined electric and gas proposals. To provide for an orderly review, the Commission considered the proposals in phases divided by customer market sectors. The initial review phase was focused on program proposals designed for the multifamily building customer market segment.⁹

NYSERDA proposed three electric-only initiatives and a number of gas initiatives for the multifamily building customer market segment. In its June 24, 2009¹⁰ Order, the Commission approved, with modifications, two of NYSERDA's electric energy efficiency programs: the Geothermal Heat Pump Systems and the Electric Reduction in Master-Metered Multifamily Buildings program (now a standalone program). The Geothermal Heat Pump Program's enhancement to MPP is described in more detail below.

Geothermal Heat Pump Systems Incentives for MPP Projects

Included in the MPP are additional incentives for the installation of geothermal heat pump (GHP) systems in multifamily buildings that participate in MPP.¹¹ GHP systems can be used for space heating and cooling in residential buildings, and excess heat from the systems in the summer months can be used for hot water heating.¹²

New participants in this program effort will have access to 79 Partners established under MPP.¹³ As the geothermal component of MPP grows, success will necessarily depend on the Workforce Development Program to ensure an adequate supply of quality systems designers and installers. A common application used by both NYSERDA and utilities will deter the potential for duplicate incentives for the same measure.¹⁴

In an effort to eliminate lost opportunities and maximize energy savings, incentives for geothermal heat pump systems will only be provided if all cost-effective energy efficiency measures are installed in the building, given the integration of the geothermal effort with MPP.¹⁵ About one-half of the total funding for the geothermal effort has been allocated for the low-income market and incentives will be provided

⁸ Case 07-M-0548, Energy Efficiency portfolio Standard (EEPS), Order Establishing Energy Efficiency Portfolio Standard and Approving Programs (issued June 23, 2008).

⁹ CASE 08-E-1132. State of New York Public Service Commission's Order Approving Electric Energy Efficiency Programs with Modifications. Issued and Effective June 24, 2009.

¹⁰ CASE 08-E-1132. State of New York Public Service Commission's Order Approving Electric Energy Efficiency Programs with Modifications. Issued and Effective June 24, 2009.

¹¹ NYSERDA, *Supplemental Revision to SBC Operating Plan - Section 4.2 Geothermal Heat Pump Systems Incentives*, December 1, 2009. A GHP system installed in a 100-unit electrically-heated multifamily building could save 1,020 MWh in heating and cooling, and additional 166 MWh savings associated with the electric heating of water over the 20 year life of the system.

¹² NYSERDA will develop a pre-screening tool, similar to the Combined Heat and Power (CHP) screening tool, and the submetering screening tool currently in use in the MPP to ensure the measure is cost-effective on its own, i.e., each installation must be estimated to achieve a minimum TRC or 1.0 and all Program Partners will be trained on how to use it.

¹³ Due to complex engineering design requirements, experienced geothermal designers are essential to the success of a project. The emerging network of designers and installers will be bolstered by the geothermal installations from this program. Installers must be certified by the International Ground Source Heat Pump Association (IGSHPA) or the Geothermal Heat Pump Air Conditioning, Heating and Refrigeration Institute, and must have installed similar units in multifamily buildings in the northeast.

¹⁴ NYSERDA, *Supplemental Revision to SBC Operating Plan - Section 4.2 Geothermal Heat Pump Systems Incentives*, December 1, 2009.

¹⁵ Incentives will be provided for between three and 30 buildings, depending upon the number of units per building, for a total of about 367 units per year. Incentives will be \$1,200 per ton of capacity, resulting in an average incentive of \$1,800 per unit.

through December 2011, with all measures installed by mid-2012. The geothermal heat pump component's annual peak demand savings are estimated to be approximately 807 kW for installed measures, with total cumulative electric energy reduction in 2015 of about 6,241 MWh and total program projected expenditure from 2009 to 2015 of \$2,326,405.¹⁶

2.1.2 Program Budget

The total program budget for MPP is presented in Table 2 below, and includes the total budgets for both the electric funding and the gas funding broken out respectively. The annual projections for 2010, 2011, and 2012 represent actual paid (invoiced) funds and, in accordance with both the various Orders and guidance from the DPS staff (the original Order as modified by the subsequent St. Lawrence, Corning and Rebalancing Orders), all EEPS funds will be encumbered (contracted) by projects by the end of December 2011. The program budget totals \$38,434,195 million from 2010 through 2012 (including the Geothermal Heat Pump Component). Although funding commitments approved by the Commission are through 2011, it is anticipated that actual expenditures for some of these committed funds will be spread out over a longer period through 2012 to help achieve the MMP program savings and goals.

Table 2. MPP Total Program Expenditures (Projected) Electric and Gas 2010-2012

Budget Category	2010	2011	2012	Total
General Administration	\$30,769	\$1,120,535	\$1,376,590	\$2,527,895
Program Planning	\$0	\$0	\$0	\$0
Program Outreach, Education and Marketing	\$5,091	\$358,596	\$0	\$363,688
Trade Ally Training	\$0	\$50,000	\$50,000	\$100,000
Incentives and Services	\$335,084	\$12,325,196	\$17,059,053	\$29,719,335
Direct Program Implementation	\$42,242	\$1,192,862	\$0	\$1,235,104
Program Evaluation	\$21,978	\$800,382	\$983,278	\$1,805,639
NYS Cost Recovery Fee	\$4,395	\$160,076	\$196,655	\$361,127
Geothermal Heat Pump Component Total Expenditures	\$1,390,843	\$930,562	\$0	\$2,321,405
Total MPP Budget¹	\$1,830,403	\$16,938,211	\$19,665,579	\$38,434,195
Electric and Gas Budgets	2010	2011	2012	Total
Electric Program	\$148,784	\$2,376,413	\$2,875,628	\$5,400,829
<i>Market Rate</i>	\$45,895	\$567,131	\$686,690	\$1,299,718
<i>Low-Income</i>	\$102,889	\$1,809,282	\$2,188,938	\$4,101,111
Natural Gas Program	\$290,775	\$13,631,235	\$16,789,949	\$30,711,961
<i>Market Rate</i>	\$191,565	\$7,972,922	\$10,017,023	\$18,181,511
<i>Low-Income</i>	\$99,210	\$5,658,313	\$6,772,926	\$12,530,450
¹ Includes Geothermal Heat Pump Component Total Program Expenditures.				
SOURCE: NYSERDA, <i>Supplemental Revision to SBC Operating Plan for Multifamily Performance Program (MPP) (electric and gas)</i> , August 31, 2010, and NYSERDA, <i>Supplemental Revision to SBC Operating Plan. Section 4.2 Geothermal Heat Pump Systems Incentives</i> , December 1, 2009.				
NOTE: Total numbers may not sum due to rounding.				

¹⁶ This total includes \$5,000 budgeted for program planning in 2009 that has been left out of the 2010 and 2011 budget items listed for the Geothermal Heat Pump Component Total Expenditures in Table 2. NYSERDA, *Supplemental Revision to SBC Operating Plan. Section 4.2 Geothermal Heat Pump Systems Incentives*, December 1, 2009.

2.1.3 Green Jobs Green New York (GJGNY) and American Recovery and Reinvestment Act (ARRA) Funding (EEPS)

Federal assistance under the American Recovery and Reinvestment Act (ARRA) has been provided to some State agencies, and is available for energy efficiency programs, including MPP. NYSERDA plans to continue to coordinate and collaborate with appropriate parties to pursue federal funding to support New York's efforts. NYSERDA and its Partners will leverage State funds with available federal funds, including GJGNY funds available for MPP due to the GJGNY Act of 2009 signed into law on October 9, 2009 by Governor David Paterson. Specifically, the state legislation proposes about \$3 million to help building owners finance their MPP projects. The GJGNY funds are used to supplement and leverage other funding sources and GJGNY goals include:

- Promoting energy efficiency, energy conservation and clean technologies,
- Reducing energy consumption and costs,
- Reducing greenhouse gas emissions,
- Supporting sustainable community development, and
- Creating green job opportunities, including for emerging, unemployed and displaced workforce

2.2 Market Assessment

All data in this section, unless otherwise noted, are from the New York City Housing Rent Guidelines Board's 2010 Housing Supply Report.

2.2.1 Description of Baseline Conditions

Buildings Already Served - Through Past NYSERDA Multifamily Initiatives

Limited detailed evaluation information is available regarding past multifamily buildings already served through NYSERDA's MPP initiatives. One such study, a Con Edison Multifamily Performance Program Market Characterization Study completed in December 2009,¹⁷ focused on MPP activities specifically implemented within Con Edison's service territory. According to that study, as of November 14, 2008, NYSERDA's past Multifamily Program had 390 projects specifically located in the Con Edison's service territory. Of these 390 projects, 297 were in the Existing Building Component (representing 82,749 individual housing units), and 93 were in the New Construction Component (representing 5,328 housing units). Affordable housing buildings represented 54% of all projects completed. According to the study, there are approximately 65 thousand multifamily buildings in New York City (representing more than 2 million individual residential housing units). Therefore, the 390 projects represent just over half of one percent of the multifamily buildings located in New York City (approximately 4% of individual NYC residential housing units) All told, NYSERDA's past Multifamily Program initiative in Con Edison's service territory has impacted 61,258,970 square feet of residential floor area, 5,778,414 of which is new construction. Also noteworthy from the Con Edison Multifamily Performance Program Market Characterization Study, within the past New Construction Component, 1,148 units in 17 projects gained LEED certification at the Silver level.

Market Share

As noted above, as of the end of 2008, there were approximately 65,000 multifamily buildings in New York City (NYC), containing more than 2,000,000 residential units. In contrast to the rest of the state, a sizable proportion of multifamily units in NYC are concentrated in large apartment buildings (with 100 units or more). These buildings accounted for only 7% of the total multifamily buildings, but 43% of the

¹⁷ NYSERDA, *Multifamily Performance Program: Con Edison Territory Multifamily Market Characterization Study*, December 2008, and NYSERDA, *Supplemental Revision to SBC Operating Plan - Section 4.2 Geothermal Heat Pump Systems Incentive*, December 1, 2009.

total multifamily units.¹⁸ The year 2009 marked a sharp change in the NYC housing construction market. The number of permits for new construction fell sharply to 1,014 building permits for 6,057 units, an 82.1% drop from 2008 levels and the least number of permits issued since 1995. Construction in 2009 also shifted to that of smaller buildings, with only 16.5% of the 1,014 building permits being issued for 5+ multifamily units. In contrast, the construction of 5+ multifamily buildings represented 74% of all building permits issued citywide in 2008.¹⁹

2.2.2 Expected Savings and Statewide Technical Potential

As shown in Table 3 and Table 4 below, MPP (including the Geothermal Heat Pump Component) is estimated to save over 48% of the achievable electric potential energy savings estimated within New York’s multifamily sector in the year 2012 and more than 100% of the achievable natural gas energy savings potential. These percentages were derived by comparing Optimal Energy’s assessment of technical electric and gas potential savings in New York for 2009-2012 with the MPP’s projected electric and gas energy savings over the same 2009-2012 period.²⁰ It is important to note that Optimal Energy’s technical potential studies did not directly identify savings potentials from the multifamily buildings sector. Instead, their reports identified achievable savings potential only at the total residential existing and low income homes sector level. Potential savings from the multifamily portion of the residential homes sector, for this logic model report, were derived using a simplifying assumption based off an estimated 18% multifamily building stock in New York’s residential sector in 2007²¹ (i.e., if 18% of New York State’s residential building stock is multifamily, then this same 18% value can be used as a proxy to estimate the amount of energy savings potential from the multifamily sector as a percent of total reported residential existing home energy savings potential).

Table 3. Achievable Potential Savings and MPP Expected Savings Totals

Sector	Cumulative Energy Savings	Cumulative Summer Peak Demand Savings
Achievable Potential Savings, 2009-2012		
Multifamily Sector ¹ (GWh)	49.5 GWh	18 MW
Multifamily Sector ¹ (MMBtu)	536,000 MMBtu	-
MPP Expected Savings², 2009-2012		
Program	Cumulative Energy Savings	Percentage of Achievable Potential
MPP (GWh)	23.938 GWh	48 ^a %
MPP (MMBtu)	542,179 MMBtu	101 ^a %
¹ Based on an estimated 18% multifamily building stock in New York’s residential sector in 2007. Source: Summit Blue Consulting, LLC, <i>New York Home Performance with ENERGY STAR® Program Market Characterization and Market Assessment Evaluation Final Report</i> , Prepared for NYSERDA, February 2009.		
² Includes low-income, market rate and Geothermal Heat Pump Component savings.		
^a Percentage of achievable potential in year 2012.		

¹⁸ NYSERDA, *Multifamily Performance Program: Con Edison Territory Multifamily Market Characterization Study*, December 2008.

¹⁹ New York City Rent Guidelines Board, *2010 Housing Supply Report*, June 3, 2010.

²⁰ NYSERDA, *Supplemental Revision to the SBC Operating Plan*, August 31, 2010, Optimal Energy, *Achievable Electric Energy Efficiency in New York State DRAFT*, November 2008, Optimal Energy, *Natural Gas Energy Efficiency Resource Development Potential In New York*, October 31, 2006, and Summit Blue, *New York Home Performance with ENERGY STAR® Program Market Characterization and Market Assessment Evaluation Final Report*, February 2009.

²¹ Source: Summit Blue, *New York Home Performance with ENERGY STAR® Program Market Characterization and Market Assessment Evaluation Final Report*, February 2009.

Sources: Optimal Energy, *Achievable Electric Energy Efficiency in New York State DRAFT* November 2008.
 Optimal Energy, *Natural Gas Energy Efficiency Resource Development Potential In New York*, October 31, 2006.
 NYSERDA, *Supplemental Revision to SBC Operating Plan*, August 31, 2010, and the *Geothermal Supplemental Revision to the SBC Operating Plan*, December 1, 2009.

Table 4. Cumulative Year by Year Annual Energy Savings (GWh and MMBtu)

	2009	2010	2011	2012	2013	2014	2015
Achievable Potential Savings - Electric (GWh)							
Achievable Potential Total Residential Existing and Low-Income Homes Sector (GWh)	33	92	173	275	397	539	694
Achievable Potential Total¹ Multifamily Sector (GWh)	5.94	16.56	31.14	49.5	71.46	97.02	124.92
Projected Savings from MPP - Electric (GWh)							
MPP - Low-Income and Market Rate (GWh)	0	0.979	12.322	23.938			
Geothermal Component - Low-Income and Market Rate (GWh)	0	3.745	6.241	0			
Projected Total Program Savings (GWh)	0	4.724	18.563	23.938			
Achievable Potential Savings - Gas (MMBtu)							
Achievable Potential Total Residential Existing and Low-Income Homes Sector (1,000 MMBtu)	1,393	2,025	2,734	2,977	3,227	3,487	3,754
Achievable Potential Total¹ Multifamily Sector (1,000 MMBtu)	251	365	492	536	581	628	676
Projected Savings from MPP - Gas (MMBtu)							
MPP - Low-Income and Market Rate (1000 MMBtu)	0	4.702	274.970	542.179			
Geothermal Component - Low-Income and Market Rate (1,000 MMBtu) ²	0	0	0	0			
Program Total (1000 MMBtu)		4.702	274.970	542.179			

¹Based on an estimated 18% multifamily building stock in New York's residential sector in 2007. Source: Summit Blue Consulting, LLC, *New York Home Performance with ENERGY STAR® Program Market Characterization and Market Assessment Evaluation Final Report*, Prepared for NYSERDA, February 2009.

²Since the geothermal component is funded with electric funds, there are no projected gas savings associated with this program. There will likely be ancillary gas savings reported with this program, but there are no gas targets.

Sources: Optimal Energy, *Achievable Electric Energy Efficiency in New York State DRAFT*, November 2008.
 Optimal Energy, *Natural Gas Energy Efficiency Resource Development Potential In New York*, October 31, 2006.
 NYSERDA, *Supplemental Revision to SBC Operating Plan*, August 31, 2010 and the *Geothermal Supplemental Revision to the SBC Operating Plan*, December 1, 2009.

2.3 Other Potentially Relevant Programs

In addition to NYSERDA's MPP, there are a number of other potentially relevant and complementary programs being implemented in New York, summarized briefly below.²² These programs are included in Section 3.5 – Program inputs and Potential External Influences of this report and are identified in Table 6 – Market Barriers, Table 11 – Program Inputs and Potential External Influences, and the program logic diagram (**Error! Reference source not found.**) as factors with the potential to impact (*i.e.*, either help or hinder) achievement of MPP goals.

NYSERDA and utility programs will coexist within each service territory as complementary programs. NYSERDA works with other New York energy efficiency program administrators to address coordination issues and minimize confusion where multiple incentive opportunities are available to customers, and coordinates with New York utilities to explain program options to building owners, share marketing materials, educate program implementers and technical consultants about each program, and cross-promote each program when appropriate. The utility programs offer rebates for specific energy efficiency measures and although the Commission initially limited utility multifamily programs to the five- to fifty-dwelling unit market, utilities may now serve larger buildings as well. This may cause some confusion in the multifamily marketplace, since previously only NYSERDA was authorized to offer energy efficiency program services to the over fifty-unit market. NYSERDA also coordinates with the NYS Division of Housing and Community Renewal's Weatherization Assistance Program (WAP) and NYC Housing Preservation and Development (HPD) to leverage additional funding for NYSERDA MPP projects, as appropriate.

NYSERDA currently administers a gas program, in conjunction with MPP, in the Con Edison service territory that provides additional incentives for higher efficiency space heating and water heating measures, provided a building owner commits to achieve additional energy savings above the minimum required level. Incorporation of gas measures into MPP will ensure that Con Edison gas customers will continue to receive program services after the current NYSERDA-administered gas program agreement expires, and will also extend program services into other gas service territories. NYSERDA will work with utilities on common advertising to their customers, as well as collaborate on joint press releases and events for building openings and other major project milestones. A common application used by both NYSERDA and utilities will deter the potential for duplicate incentives for the same measure.²³

NYSERDA also administers the EmPower Program. Multifamily projects submitted to the EmPower Program are first screened for eligibility and potential participation in MPP. Under MPP, new construction of multifamily buildings and existing multifamily buildings are eligible for incentives that improve energy savings through energy efficiency or innovative energy solutions, such as renewable energy. Additional incentives are available for projects that serve or are expected to serve low-income tenants, as well as income qualified housing that meets certain sustainability guidelines. To be eligible for affordable housing incentives, the building owner must demonstrate that the property is publicly-subsidized or that at least 25% of residents receive public assistance or earn below 80% of the State Median Income. If projects are participating in MPP, then they are not accepted into NYSERDA's EmPower Program.

In addition, New York utilities will be implementing the following programs:

- Con Edison (\$32.7 million) including \$2.67 million set aside for low-income properties
 - In Con Edison service territory, incentives will be offered to building owners to install more energy-efficient refrigerators. In addition, incentive payments for energy efficiency

²² State of New York Public Service Commission Press Release: Multifamily Program. July 24, 2009.

²³ NYSERDA EEPs Program Administrator Proposal – Revised May 19, 2009. MSWord document title: NYSERDA Multifamily 90-Day UPDATE FINAL DRAFT 7-30-09. Section 2.

improvements will be offered to landlords of rent-stabilized apartments in return for foregoing rent increase associated with implementation of energy efficiency measures.

- National Grid (\$4.7 million) and National Grid (KeySpan) Long Island (\$980,687) – The National Grid Energy Wise program will provide incentives for the installation of energy efficient building measures such as insulation, sealing, attic ventilation, duct work and air infiltration testing, lighting and refrigerator replacement. The program also includes the free installation of up to six compact fluorescent bulbs per dwelling unit, incentives toward refrigerator replacement costs, and free installation of low-flow showerheads, aerators and wraps for hot water piping and tanks.²⁴
- National Grid (KeySpan) New York (\$4.54 million) – This program offering for National Grid (KeySpan) New York will be similar to those under the main National Grid Energy Wise program. Building owners will be provided with incentives for the installation of energy efficiency building measures, and will include the free installation of up to six compact fluorescent bulbs per dwelling unit, incentives toward refrigerator replacement costs, and free installation of low-flow showerheads, aerators and wraps for hot water piping and tanks.²⁵
- New York State Energy and Gas (NYSEG) (\$1.46 million)
 - The NYSEG program will provide equipment replacements and rebates to building owners . Under the program, building owners are entitled to the free installation of up to six compact fluorescent bulbs in dwelling units, incentives up to 50% of the cost of common area lighting upgrades, and incentives toward refrigerator replacement costs.²⁶
- Rochester Gas and Electric (RG&E) (\$1.3 million)
 - Similar to the NYSEG program offerings, the RG&E program provides to building owners the free installation of up to six compact fluorescent bulbs in dwelling units, incentives up to 50% of the cost of common area lighting upgrades, and incentives from toward refrigerator replacement costs.²⁷

²⁴ [National Grid Website](http://www.nationalgridus.com/aboutus/a3-1_news2.asp?document=5193): http://www.nationalgridus.com/aboutus/a3-1_news2.asp?document=5193. Archived October 4, 2010.

²⁵ [National Grid Website](http://www.nationalgridus.com/aboutus/a3-1_news2.asp?document=5193): http://www.nationalgridus.com/aboutus/a3-1_news2.asp?document=5193. Archived October 4, 2010.

²⁶ [NYSEG Website](https://www.nyseg.com/UsageAndSafety/usingenergywisely/eeps/multifamily.html): <https://www.nyseg.com/UsageAndSafety/usingenergywisely/eeps/multifamily.html>. Archived October 4, 2010.

²⁷ [RG&E Website](http://www.rge.com/UsageAndSafety/usingenergywisely/eeps/multifamily.html): <http://www.rge.com/UsageAndSafety/usingenergywisely/eeps/multifamily.html>. Archived October 4, 2010.

Section 3: KEY ELEMENTS SUMMARY

Based on a review of relevant NYSERDA documents, some key elements of NYSERDA’s Multifamily Performance Program have been identified and are summarized below.

3.1 Ultimate Goals

The EEPS Multifamily Performance Program will operate to accomplish the following program goals:

- Create a market-based network of building performance specialists that are capable of delivering services to developers, building owners and their representatives;
- Facilitate access to capital to fund comprehensive energy and energy-related improvements;
- Reduce the burden imposed by energy consumption and other utility-related costs, with a significant emphasis on providing this benefit to low- to moderate-income residents;
- Promote geothermal heat pump technology through the provision of additional measure-level incentives;
- Promote the ENERGY STAR® label; and
- Support NYSERDA’s contribution to the Governor’s energy savings goals for New York.

Table 5 below includes projected MPP customer participation from 2010 to 2012. (Refer to Section 2.2.2 – Expected Savings and Statewide Technical Potential for information on MPP savings goals.)

Table 5. MPP: Customer Participation (Projected # of Units) 2010-2012

	2010	2011	2012	Total
Total Customers¹	1,034	18,221	18,382	37,636
Electric Customers	897	10,397	10,648	21,943
<i>Low-Income</i>	762	6,830	7,158	14,750
<i>Market-Rate</i>	136	3,567	3,490	7,193
Gas Customers	136	7,823	7,735	15,694
<i>Low-Income</i>	68	2,227	2,478	4,773
<i>Market-Rate</i>	68	5,596	5,257	10,921

¹In addition to the Total Customers (Projected # of Units) for MPP presented in the table, Geothermal Heat Pump Component incentives will be provided for three to 30 buildings, depending on the number of units per building, for a total of about 367 additional units per year.

SOURCE: NYSERDA, *Supplemental Revision to SBC Operating Plan for Multifamily Performance Program (MPP) (electric and gas)*. August 31, 2010, and the NYSERDA, *Supplemental Revision to SBC Operating Plan. Section 4.2 Geothermal Heat Pump Systems Incentives*, December 1, 2009.

3.2 Market Barriers, Including Those that the Program Attempts to Address (“the Problem”):

Markets are typically defined by the products, services, and market events that characterize the requirements of a specific group of consumers. There may be different market actors for different market events or different products or services. In the case of a multifamily building, any changes to the overall building or changes that significantly affect an individual’s energy usage and bills often involve several decision makers and a more complicated process than for a single-family home. These processes and challenges are similar across the range of energy-using equipment and investment decisions. This

similarity in market barriers across products and services and even across market events (e.g., renovation of existing properties versus new construction) is why this consolidated Multifamily Performance Program, for many different energy products and services, has been created.

Encouraging market actors within the multifamily buildings market to adopt greater levels of efficiency, desired behavioral changes, and the use of new energy technologies is often affected by a wide range of barriers. These barriers can be broken down into three general categories: barriers affecting the supply side, barriers affecting the mid-market and infrastructure, and barriers affecting demand-side (and associated end-use) market actors. Supply-side and mid-market and infrastructure barriers include conflicting utility programs, business practices and policies that deter the development and delivery of energy efficient products and services, or indicate an insufficient availability of, or commitment to, such energy-efficient products and services. Demand-side barriers primarily involve building owners, developers, building operators and competing programs.

Table 6 lists specific barriers and the related market actors (not ordered by priority). The barriers are labeled “S” (for supply), “M” (for mid-market and infrastructure) and “D” (for demand), are numbered for later reference, and items marked with an asterisk (*) denote barriers that are being directly addressed through NYSERDA’s MPP. Note Table 6 is meant to be a comprehensive list of market barriers that could potentially impact achievement of key MPP goals. Each of these potential barriers would need to be tested and evaluated in order to determine to what extent they specifically impact the multifamily market.

Table 6. MPP Market Barriers and Associated Market Actors

Market Area	Barriers	Market Actors
Supply side	S1* – Perceptions of a lack of demand for energy efficiency and new energy technologies in multifamily buildings S2 – Inferior or inconsistent product quality S3* – Lack of availability of high efficiency product at reasonable prices S4 – Lack of repair parts of efficient equipment and new energy technologies S5 – Lack of standards for advanced meters and common connectivity environment for broad market development of advanced metering and real time pricing products and services	Manufacturers, distributors, suppliers, utilities, regulators

Table 7. MPP Market Barriers and Associated Market Actors (continued)

Market Area	Barriers	Market Actors
<p>Market Infrastructure and Policy</p>	<p>M1* – Lack of readily-available auditors and contractors for assessing a broad range of efficiency and advanced metering options for multifamily buildings within local markets</p> <p>M2* – Lack of differentiation among contractors and marketers for those qualified and skilled at broadening the target audience for energy efficiency and new energy technologies</p> <p>M3* – Concern from lenders and owners regarding ability to obtain a return on their investment (ROI) due to split incentive issues (e.g., , to recover the increased costs associated with investing in high efficient HVAC equipment, building envelope improvements, advanced metering and renewable technologies, etc., building owners would need to increase the rent or see an increased occupancy rate within their buildings since building owners may only obtain direct dollar savings from common area improvements vs. the dollar savings their tenants would obtain through electric bill reductions).</p> <p>M4* – Lack of repair knowledge for energy-efficient equipment and new energy technologies</p> <p>M5* – Tenant and owner resistance to new technologies (e.g., combined heat and power, and advanced meters)</p> <p>M6 – Lack of contractor training to install new technologies</p> <p>M7 – Lack of experience with advanced meters, real time pricing and pricing system changes and other new technologies</p> <p>M8* – Uncertainty with performance and savings</p> <p>M9* – Business practices and internal regulations that limit the use of life-cycle cost perspectives</p> <p>M10* – Lack of awareness, knowledge, understanding of energy efficiency and new energy technologies</p> <p>M11* – Regulatory barriers, such as accreditation needed for installers to meet Commission and utility standards, refining meter classifications and certified equipment lists</p> <p>M12 – Lack of availability of real-time pricing structure linked to hourly changes in wholesale prices versus traditional time of use rate linked to average prices</p> <p>M13* – Rules and regulations of standard financing process do not include full accounting of benefits from investments in new energy technologies or energy efficiency</p> <p>M14* – Lender uncertainty regarding how to process and account for loans (for efficiency and new energy technology projects) that deviate from standard practices</p> <p>M15* – Rules and procedures by housing regulators (e.g., HUD, DCHR) that hinder prompt design and installation of improvements</p> <p>M16* – Policies of other low-income programs</p> <p>M17* – Conflicting utility programs</p>	<p>Multifamily building owners and managers, developers, not-for-profit housing entities, and public housing authorities.</p> <p>Lenders and financial institutions</p> <p>General and speciality contractors</p> <p>Building auditors</p> <p>Designers</p> <p>Architects</p> <p>Construction inspectors</p>

Table 8. MPP Market Barriers and Associated Market Actors (continued)

Market Area	Barriers	Market Actors
Demand side	D1* – Tenant resistance to change D2*– Uncertainty about savings D3 – Language barriers (English not primary language) D4* – Lack of awareness and knowledge of opportunities with energy efficiency D5* – Undervaluing the positive impacts associated with investments in energy efficiency, new energy technology, and obtaining energy usage information to help cut demand costs (<i>i.e.</i> , too much focus on the higher first cost, and not seeing the full life cycle costs and benefits) D6* –Split incentive (investments made by owners but tenants reap energy bill savings) D7* – Lack of financing for making improvements or unknown capability to include improvement costs in financial packaging D8* – Higher cost of meters and new energy technologies D9* – Lack of knowledge and experience in managing varying prices D10* – Confusion caused by overlapping utility programs	Owner or manager-occupied building owners or managers, condo-owners, residential consumers and tenants

3.3 Targeted Market Actors:

The Multifamily Performance Program has a broad mix of market actors due to the collective programs and initiatives that are provided under this one multifamily program. The program provides technical and financial incentives for developers, public housing authorities and residential consumers in both market-rate and low-income market segments. Approximately 25% of the program funding is allocated for the low-income market and will be served partially by the federally-funded WAP. MPP targets eligible multifamily buildings of greater than 75 dwelling units with (firm) natural gas or electricity as their primary heating source; however owners of smaller buildings may participate in the MPP under circumstances where building owners prefer the MPP approach over other options (including other NY utilities). Additionally, as MPP targets all types of multifamily building ownership, increased penetration is expected in the rental, cooperative and condominium markets. Indirectly, the program also leverages the expertise of equipment vendors, installation contractors and energy service companies. MPP affects the demand for related projects by providing information to support decisions made by building owners and managers, institutional decision-makers and industrial firms. Enhancing the energy services infrastructure will involve developing market-based business opportunities for building auditors, financial packagers, designers, architects, and construction inspectors.

3.4 Program Implementation Approach (“Activities”):

Multifamily Performance Program activities are carried out by market actors within the demand-side, mid-market and infrastructure areas, and supply-side (particularly in the area of advanced meters) to help address key market barriers.

As presented in Table 9 and the Logic Model Diagram in Section 4: , MPP activities can be grouped into six key areas:

- 1) Recruitment and training activities,
- 2) Facilitation and market infrastructure development activities,
- 3) Collaboration and coordination activities,

- 4) Technical and financial assistance activities,
- 5) Outreach, education, and marketing activities, and
- 6) Quality control and quality assurance review activities.

Table 9 lists the Multifamily Performance Program activities, grouped along the supply-demand continuum. The logic model in Section 5: Section 4: below is diagrammed from left to right to match this continuum.

Table 9. Multifamily Performance Program Activities

Recruitment and Training Activities (Supply-Side and Mid-Market and Infrastructure)
<p>Recruit qualified firms to serve as Partners</p> <p>Develop and deliver training to Partners on energy modeling, energy auditing, monitoring of construction and program requirements</p> <p>Establish Participation Agreements</p> <p>Conduct training on energy efficiency rationale for engineers and architects</p> <p>Train customers and service providers:</p> <ul style="list-style-type: none"> - Multifamily Building Analyst training - Energy Efficient Building Operation & Maintenance training - Energy Efficient HVAC Design & Commissioning training
Facilitation and Market Infrastructure Development Activities (Mid-Market and Infrastructure)
<p>Issue solicitations to identify consultants capable of serving as Partners</p> <p>Screen and promote firms to serve as Partners</p> <p>Support Partners to conduct engineering feasibility studies that provide information to decision-makers</p> <p>Provide an annual Partner Conference to bring together all program Partners to discuss potential changes to the program, learn about new technologies, and meet with representatives from the utilities, housing regulators, and others to better understand their programs and how they can support the needs of their clients</p> <p>Develop Benchmarking tools</p> <p>Develop ENERGY STAR criteria and designation for new and existing multifamily buildings</p> <p>Develop market-based business opportunities</p>
Collaboration and Coordination Activities (Mid-Market and Infrastructure)
<p>Work with other program administrators to address coordination issues and minimize confusion where multiple sources for incentives are available to customers</p> <p>Work with New York utilities to develop cut-sheets that explain all of the program options to a building owner, share marketing materials, educate program implementers and technical consultants about each others' programs and cross-promote each others' programs when appropriate</p> <p>Coordinate with WAP and HPD programs to leverage additional funding, as appropriate</p> <p>Work with DPS Staff and the EEPS Evaluation Advisory Group to revise and finalize a detailed evaluation plan for MPP (including establish rigorous and defensible estimates of the savings that can be attributed to MPP, develop a comprehensive understanding of current and emerging markets, assess MPP accomplishments and market penetration, identify any process concerns, and develop recommendations to improve the efficiency and effectiveness of the program)</p> <p>Coordinate impact evaluation and other survey efforts with the MPP Refrigerator M&V plan to the extent possible</p>

Table 10. Multifamily Performance Program Activities (continued)

Technical and Financial Assistance Activities (Mid-Market and Infrastructure and Demand-Side)
Provide technical assistance for implementation and commissioning
Provide inspections of the measures installed under the program to assure quality control
Provide review for enhancement of Energy Reduction Plans produced by Partners
Provide contract and construction advice and assistance
Direct on-site scoping sessions (for Existing Facilities)
Provide assistance in finding funding sources
Provide financial incentives via direct incentives to facilitate installation of energy efficiency
Provide financial incentives for the Geothermal Heat Pump Program
Provide partial reimbursement for the purposes of modeling software and licenses and for co-op advertising
Coordinate with NYSERDA’s WFD program to provide partial reimbursement for training and certification, or accreditation of Program Partner’s direct employees and subcontractors
Process incentive payments
Outreach, Education and Marketing Activities (Demand-Side)
Provide educational material through Program Partners, NYSERDA’s residential website (www.getenergysmart.org), and NYSERDA’s Energy \$mart Community Coordinators
Develop outreach and educational materials including brochures and case studies at events such as conferences, trade shows, and building openings (including program branding efforts)
Conduct training for building owners and facility managers
Provide education for tenants
Quality Control and Quality Assurance Review Activities (Demand-Side)
Conduct quality control on energy calculations and energy reduction plans
Conduct verification and installation quality checks
Ensure that NYSERDA is provided with third-party access to interval data from meters to measure and verify energy savings
Conduct verification and quality assurance for the Geothermal Heat Pump Program
Establish and review program guidelines and program participation criteria
Maintain network of highly qualified energy service contractors
Ensure work in the program is cost effective and perform site inspections
Review and approve customer applications for QC purpose
Review Energy Reduction Plans and other technical documents for accuracy
Develop case studies
Report program metrics to DPS Staff and other stakeholders

3.5 Program Inputs, Anticipated Outputs and Outcomes, and Potential External Influences

Specific outputs and outcomes anticipated for the Multifamily Performance Program activities are shown in the logic diagram in Section 4: below. More information on these outputs and outcomes, and associated measurement indicators can be found in Table 13 and Table 15 immediately following the diagram (see Section 5:).

The ability of Multifamily Performance Program efforts to accomplish a level of outputs that will, in turn, cause the anticipated outcomes and the associated causal chain leading to the program’s ultimate goals is dependent on the level and quality and effectiveness of inputs that go into these efforts. There are also external influences that can assist the development of the required outcomes or hamper them. Key Multifamily Performance Program inputs and potential external influences are presented in Table 11 below.

Table 11. Multifamily Performance Program Inputs and Potential External Influences

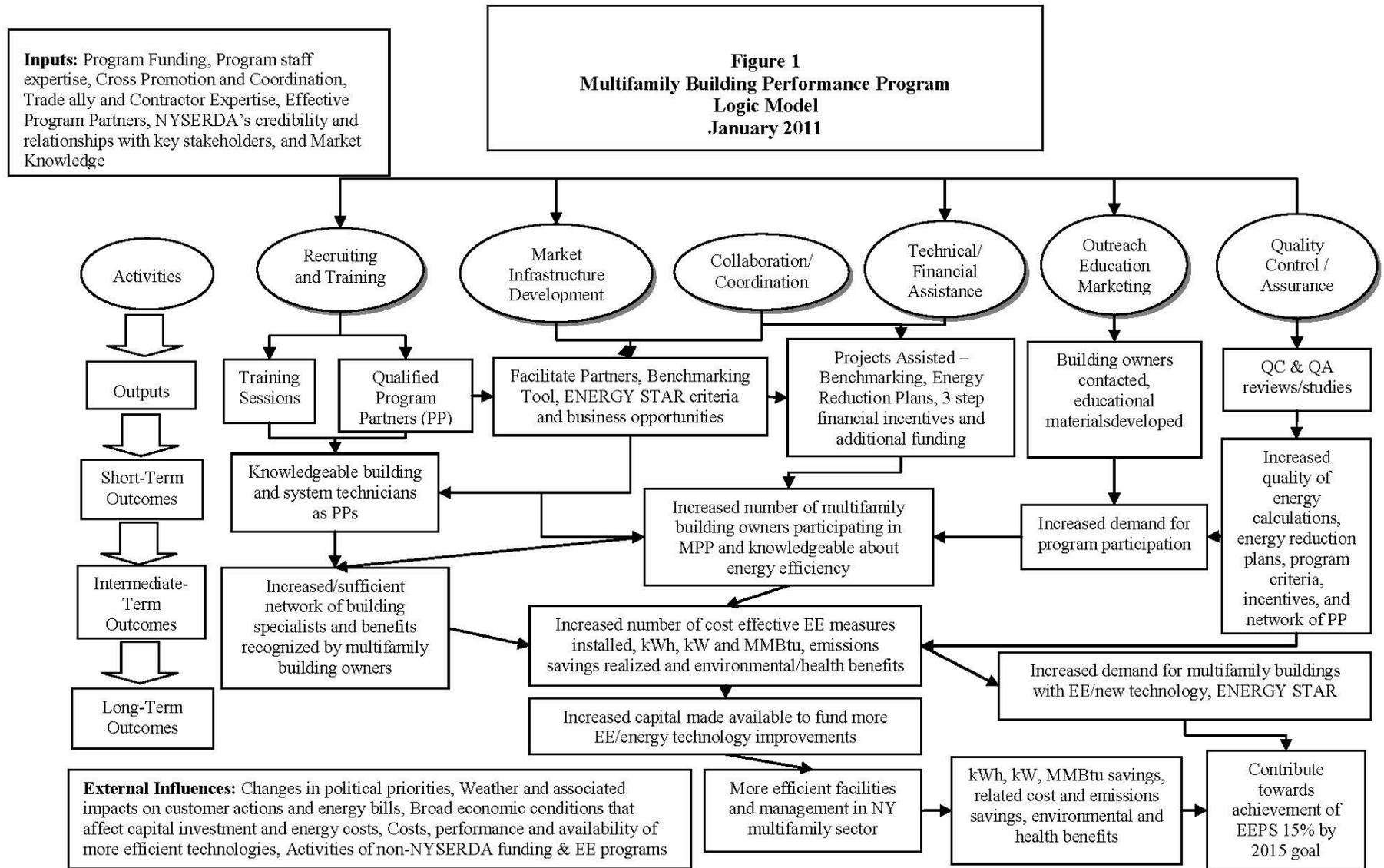
Program Inputs
<p>EEPS funding and potential additional funding streams may include: existing SBC, ARRA, GJGNY, and leveraged funding from other relevant sources (utility programs, WAP, HPD)</p> <p>NYSERDA’s program staff resources and prior experience implementing SBC-funded programs</p> <ul style="list-style-type: none"> • NYSERDA’s credibility and relationships with key stakeholders and policy makers • Staff experience implementing the New York Energy \$martSM Programs and other EEPS programs • NYSERDA’s and program staff’s market knowledge and existng relationships with key training partners • Knowledge, skills, abilities and experience of the Implementation Contractor <p>Coordination and cross promotion with other NYSERDA and non-NYSERDA programs</p> <ul style="list-style-type: none"> • Gas efficiency measures program being implemented by NYSERDA in Con Edison’s service territory, Empower • Weatherization Assistance Program (ARRA Funding) • ENERGY STAR • LEED <p>Expertise of trade allies and contractors</p> <ul style="list-style-type: none"> • Regional and national program staff and contractors • Program Partners <p>Exisitng awareness of NYSERDA among market actors</p> <p>NYSERDA’s ability to recruit effective Program Partners</p>

Table 12. Multifamily Performance Program Inputs and Potential External Influences (continued)

External Influences and Other Factors
<p>Changes in political priorities</p> <ul style="list-style-type: none"> • Perceptions of energy and global climate change issues • Codes and standards • Federal energy policies including energy related tax credits and the American Recovery and Reinvestment Act (ARRA) funding • State and local action & requirements (including local energy commissions) <p>Weather and associated impacts on customer actions and energy bills</p> <p>Broad economic conditions that affect capital investment and energy costs (rapidly changing economic conditions)</p> <ul style="list-style-type: none"> • Energy prices and regulation (changes in fuel and energy prices and rate structures) • Changes in utility rate structures • Bank lending practices • Perceptions of the value of “green” building and LEED • Activities of public and institutional purchasers and projects <p>Costs, performance and availability of more efficient technologies</p> <p>Competition – internal and external</p> <ul style="list-style-type: none"> • Internal – demand-side customers competing priorities • External – broad market and demand for provisions and supply of building performance and technologies and services • Competition among target market actors and contractors that affect willingness to promote energy efficiency • Other service organizations investments and commitments to energy efficiency, demand response, or renewable energy <p>Activities of non-NYSERDA funding public and institutional energy efficient programs</p> <ul style="list-style-type: none"> • State, regional and national Programs • Certification Programs • Utilities (See Section 2.3)

Section 4: PROGRAM LOGIC MODEL DIAGRAM

The following page contains a logic model diagram (Figure 1) for NYSERDA's Multifamily Performance Program, showing the linkages among activities, outputs and outcomes, and identifying inputs and potential external influences. The diagram presents key features of the updated program, including EEPS activities and goals. The logic diagram presented here is at a slightly higher level than the tables in this report, aggregating some of the outcomes, in order to make the logic model easier to read. (Evaluation research should use the more detailed tables, in addition to the diagram, in examining the anticipated linkages and performance through the various outcomes.)



Section 5: OUTPUTS, OUTCOMES AND ASSOCIATED MEASUREMENT INDICATORS

It is important to distinguish between outputs and outcomes. For the purposes of this logic document, outputs are defined as the immediate results from specific program activities. These results are typically easily identified and can be counted, often by reviewing program records.

Outcomes are distinguished from outputs by their less direct (and often harder to quantify) results from specific program activities. Outcomes represent anticipated impacts associated with NYSERDA’s program activities and will vary depending on the time period being assessed. On a continuum, program activities will lead to immediate outputs that, if successful, will collectively work toward achievement of anticipated short-, intermediate-, and long-term program outcomes.

The following tables list outputs (Table 13) and outcomes (Table 15), taken directly from the logic model, and associated measurement indicators. For each indicator, a proposed data source or collection approach is presented. Where appropriate, the need for baseline data is also noted. Items in this table should be prioritized and subsequently considered as potential areas for investigation as part of a formal program evaluation plan.

Table 13. Program Outputs, Associated Indicators and Potential Data Sources

Outputs	Indicators	Data Sources and Potential Collection Approaches
Outputs from Recruitment and Training Activities		
Training sessions	Number and location of training sessions held, venue, target audience	Attendance sheets Training feedback forms Review of training feedback
Building operations and performance specialists, auditors, and contractors trained and retained as program Partners	Number and type of program Partner applications, number of program Partners, and number of businesses represented	Review of program database, related files and documents Interviews with applicants who became program Partners and applicants who did not become program Partners
Outputs from Facilitation and Market Infrastructure Development Activities		
Facilitate program Partners, Benchmarking Tools, ENERGY STAR criteria and business opportunities	Number and type of program Partner teams contracted (market rate and low-income), number and type of Benchmarking Tools and energy audit tools, ENERGY STAR criteria, and number, type and location of businesses opportunities (market rate and low-income)	Review of program database, related files and documents Interviews with applicants who became program Partners and applicants who did not become program Partners
Outputs from Collaboration and Coordination Activities		
Facilitate program Partners, Benchmarking Tools, ENERGY STAR criteria and business opportunities Projects Assisted – Benchmarking and Energy Reduction Plans completed	Number and type of program Partner teams contracted (market rate and low-income), number and type of Benchmarking Tools and energy audit tools and ENERGY STAR criteria developed, number, type and location of businesses opportunities identified, and Plans completed (market rate and low-income)	Review of program database, related files and documents Interviews with applicants who became program Partners and applicants who did not become program Partners

Table 14. Program Outputs, Associated Indicators and Potential Data Sources (continued)

Outputs	Indicators	Data Sources and Potential Collection Approaches
Outputs from Technical and Financial Assistance Activities		
Projects Assisted – Benchmarking completed	Number and type of Benchmarking studies completed and in progress (market rate and low-income)	Review of program database and completed studies
Projects Assisted – Energy Reduction Plans completed	Number and type of Energy Reduction Plan (market rate and low-income)	Review of program database, related files and documents
Projects Assisted – financial incentives and additional funding provided	Number and type of projects that received financial assistance or funding support, by type and source of funding (market rate and low-income)	Review of project database, related files and documents
Outputs from Outreach, Education and Marketing Activities		
Buildings owners indentified or contacted Educational materials, training (and branding) developed	Number and types of building owners indentified and contacted, number of training sessions held, attendance, target audience Number and types of educational information presented (brochures, case studies, etc. including branding efforts)	Review of program database, related files and documents Attendance sheets Training feedback forms Review of training feedback Interviews with trainers and attendees to gauge effectiveness of training sessions
Outputs from Quality Assurance Review Activities		
QC & QA reviews and studies completed	Number and type of reviews completed and in process Quality ratings, issues found and resolution of issues found (market rate and low-income)	Review of program database, related files and documents Interviews with QA consultants and QC program staff

Table 15. Program Outcomes, Associated Indicators and Potential Data Sources

Outcomes	Indicators	Data Sources and Potential Collection Approaches
Short-Term (1-5 years) Outcomes		
<p>Knowledgeable building & system technicians working as program Partners</p>	<p>Number of technicians working with the program</p> <p>Tracking pass and fail rate of trainees in MF Building Analyst, MF Building Operator, and MF Heating System courses</p> <p>Knowledge level of building & system technicians regarding energy efficiency equipment, particularly equipment and operations training provided through the program</p>	<p>Review of program database, related files and documents</p> <p>Review of BPI tests administered</p> <p>Survey and review of test results (pass/fail statistics) of building & system technicians</p> <p>Survey of building owners (market rate and low-income)</p> <p>Post-participation energy analysis and facility operations audit (market rate and low-income)</p>
<p>Increased number of multifamily buildings owners participating in MPP and knowledgeable about energy efficiency</p>	<p>Change in the number of projects in the program to include energy efficiency, energy-efficient technology, geothermal systems and/or advanced metering (market rate and low-income)</p> <p>Change in the number of building owners having knowledge of energy efficiency and associated technologies. Increase in lenders in the market considering energy efficiency and energy-efficient technology and advanced metering in granting loans (market rate and low-income)</p>	<p>Review of program database, related files and documents</p> <p>Surveys with building owners</p> <p>Market assessment of loans to multifamily buildings that support energy efficiency and energy-efficient technology and advanced metering and geothermal when conducting rehabilitation, renovation or new multifamily capital projects (market rate and low-income)</p>
<p>Increased demand for program participation</p>	<p>Number of requests for energy assessments, design and construction assistance, reduced interest financing, and advanced metering and direct load control assistance in comparison to number of requests in previous years of the program</p>	<p>Review of program database, related files and documents</p> <p>Surveys of participants and potential participants</p>
<p>Increased quality of energy calculations, energy reduction plans, program criteria, program incentives, and qualified network of program Partners</p>	<p>Increase accuracy and market acceptance of energy calculations, benchmarking tools and energy reduction plans</p> <p>Increased refinement and acceptance among program Partners of program criteria</p> <p>Increased refinement and acceptance of program incentives</p> <p>Increased performance and acceptance of program Partners</p>	<p>Review of program database, related files and documents</p> <p>Surveys of program Partners, participants, DPS and other market actors</p>

Table 16. Program Outcomes, Associated Indicators and Potential Data Sources (continued)

Outcomes	Indicators	Data Sources and Potential Collection Approaches
Intermediate-Term (5-10 years) Outcomes		
Increased and sufficient network of properly-trained building & system technicians recognized by multifamily building owners	Number of building performance specialists trained and areas of training in each year of the program Training reimbursement incentives provided, number and dollar amount Number of projects completed by specialists within the program. Time from initial contact to completion of project Quality of completed projects, as determined by post-completion inspections Multifamily building owners recognize benefits of properly trained building & system technicians Multifamily owners find it profitable to use knowledgeable building & system technicians Knowledgeable building & system technicians are in greater demand Multifamily property owners seek training for, or seek trained, building & system technicians for other properties Implementation of energy efficiency recommendations	Review of program database, related files and documents Survey of specialists Market assessment (market rate and low-income) Interviews with program participants on timeliness and quality of work by specialists Site Visits (market rate and low-income) Interviews with multifamily building owner program participants and program Partners Review of program database for owners with training of technicians in other properties subsequent to the first trainees they send Review of program database
Increased number of cost effective energy efficient measures installed, kWh, kW, MMBtu, emissions savings realized and environmental and health benefits	Number and type of energy efficient measures installed Energy savings and emission calculations Calculated bill reductions	Review of program database, related files and documents Survey of multifamily building owners
Increased demand for multifamily building with energy efficient and new energy technology and increased market value of ENERGY STAR label multifamily buildings	Market Share of multifamily homes constructed to ENERGY STAR standards (market rate and low-income) Real Estate advertising that includes ENERGY STAR logo Level of profitability recognized by building owners for obtaining an ENERGY STAR label on their multifamily properties	Survey of multifamily residents, and building owners with respect to ENERGY STAR (market rate and low-income, within and outside of program) Advertising content analysis Comparative study of multifamily properties with and without ENERGY STAR label Market assessment surveys and interviews of multifamily owners and capital and finance market

Table 17. Program Outcomes, Associated Indicators and Potential Data Sources (continued)

Outcomes	Indicators	Data Sources and Potential Collection Approaches
Owners and financial decision-makers understand relationship between energy efficiency investments and cash flow improvements	Applications for reduced-interest financing Dollars allocated to energy efficiency improvement recommendations by program Partners	Examination of applications for specific energy efficiency measures being funded Surveys of owners and financial decision-makers
Increased capital made available to fund more energy efficient and new energy technology improvements in multifamily buildings	Change in the number of program applications and leveraged funding Change in the amount of investments made by building owners and capital/finance market actors in multifamily energy efficiency and energy-efficient technology (market rate and low-income, with and without program assistance)	Review of project database, related files and documents Market assessment surveys and interviews of multifamily owners and capital and finance market (market rate and low-income)
Long-Term Outcomes (10+ years)		
More efficient facilities and management in the NY multifamily sector Energy, demand and new energy technologies included in multifamily building project planning and maintenance activities Increased energy efficiency within building codes for multifamily buildings	Proportion of multifamily building stock that is energy efficient Percentage of buildings with low Energy Use Index increases Percentage of buildings with capability to respond to demand response calls increases Incorporation of efficiency and new energy technologies in standard operations (market rate and low-income, with and without program assistance) Investments in multifamily energy efficiency and energy-efficient technology and advanced metering (with and without program assistance) Market share of advanced metering and direct load control technologies (with and without program assistance) Building code changes requirements for efficiency levels in equipment and construction practices for multifamily buildings	Study of current practice in building energy use for NY State buildings and demand response capability Review of program database, related files and documents Market assessment surveys and interviews of multifamily building owners and capital and finance market (market rate and low-income, with and without program assistance) Assessment of energy component of state building code
Energy savings, peak demand reduction, and related emissions and bill reductions, and environmental and health benefits	kW, kWh and therm savings, and corresponding environmental, health and community benefits (market rate and low-income, with and without program assistance)	Impact evaluation study for kW, kWh, therm savings (market rate and low-income, with and without program assistance) Environmental, health and community economic studies of net impacts based upon savings benefits
EEPS 15% energy reduction goals are met through sustainable portfolio of market-driven energy efficiency products, services and programs		

Section 6: TESTABLE HYPOTHESES (RESEARCHABLE ISSUES) FOR EVALUATION EFFORT

Based on this program logic model assessment for NYSERDA's Multifamily Performance Program, a number of evaluation-specific researchable issues have been identified and are noted below. Some of these have been investigated and continue to be investigated through NYSERDA evaluation activities.

Research addressing these questions will help to validate the reasonableness of the associated theories and will help inform NYSERDA program staff of progress and potential areas for program enhancement and refinement.

Based on recognition of key underlying program hypotheses, the following issues are proposed for potential testing. These issues are grouped into short-, intermediate-, and long-term periods to represent when they are expected to become important or verifiable.

Short-Term:

- Does the program-supported training create knowledgeable building and system technicians capable of implementing energy saving practices and technologies to actually realize the expected energy savings and performance?
- Does the quality assurance effort verify and increase the likelihood for achieving the expected energy savings and performance? Is it helping to increase the demand for program participation?
- Do the program experiences and trainings cause owners and financial decision-makers to understand and value the relationship between energy efficiency, rate structure and cash flow improvements?
- What are the most effective outreach, education and marketing methods and strategies to increase demand for program participation?

Intermediate-Term:

- Does the program directly and indirectly (through the mechanisms identified in the logic model) create energy and peak demand savings?
- Does increased perceived value in ENERGY STAR multifamily buildings and products translate into greater investments in these areas?

Long-Term:

- Are energy efficient products more readily available in the market (e.g., low e, argon filled windows, energy efficient HVAC systems)? Have costs dropped for these products based on increased demand?
- Is the program transforming the multifamily building market into one that is more supportive of energy efficiency, energy-efficient technologies and advanced metering through a sufficient network of knowledgeable building performance specialists? Are banks granting loans and taking into effect the lower costs associated with an energy efficient building? Are apartments in energy efficient buildings in greater demand than apartments in ordinary buildings?
- How is the market changing to support energy efficiency and energy-efficient technologies, advanced metering and real time pricing and ENERGY STAR labels for multifamily properties in light of changing knowledge and perceived values of these attributes?