

# **Multifamily Performance Program Process Evaluation and Market Characterization**

## *Final Report*

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## Abstract

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This report presents the findings from the combined process evaluation and market characterization and assessment (PE/MCA) of the Multifamily Performance Program (MPP) that occurred in 2013 and early 2014. The primary objectives of this project were to provide a comprehensive understanding of current and emerging multifamily markets, to assess the activities that occurred in MPP versions 4 (September 2010 – July 2012) and 5 (July 2012 – present) of the program, to provide a baseline of market effects in the multifamily housing market, and to determine potential strengths and weaknesses of the program’s processes. First, the PE/MCA team used secondary sources to identify and analyze the following characteristics of the multifamily market in New York State: existing multifamily buildings, multifamily new construction, New York City benchmarking data, vacancy rates, and program participation data. Second, the team used mostly secondary sources to assess activities completed during versions 4 and 5 of the program. Third, the PE/MCA team established a baseline of market effects and evaluated MPP’s processes through surveys or interviews with 21 MPP staff, 50 energy consulting firms (“Partners”), 110 program participants, and market actors (architects, engineers, energy efficiency consultants, and building contractors that work in the multifamily sector but are not program Partners) in New York State (341) and, for comparison, in Pennsylvania (127), a neighboring state without extensive multifamily energy efficiency programs.

## Key Words

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Energy efficiency, multifamily buildings, new construction, existing buildings, market characterization, market assessment, evaluation research.

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## Acronyms and Abbreviations

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ACEEE	American Council for an Energy-Efficient Economy
AMP	Assisted Multifamily Program
ASHRAE	American Society of Heating, Refrigerating, and Air Conditioning Engineers
BPI	Building Performance Institute
CRIS	Comprehensive Residential Information System
DOE	U.S. Department of Energy
EAC	Energy Aligned Clause
EB	Existing Buildings
EE	Energy Efficiency
EEPS	Energy Efficiency Portfolio Standard
EIA	Energy Information Administration
EPA	U.S. Environmental Protection Agency
ERP	Energy Reduction Plan
GJGNY	Green Jobs – Green New York
IDI	In-depth interview
LEED	Leadership in Energy and Environmental Design
MF	Multifamily
MPP	Multifamily Performance Program
M&V	Measurement and Verification
NC	New Construction
NYC	New York City
NYS	New York State
NYSERDA	New York State Energy and Research Development Authority
PE/MCA	Process Evaluation/Market Characterization and Assessment team
PV	Solar photovoltaic system
RGGI	Regional Greenhouse Gas Initiative
ROI	Return on investment
SBC	Systems Benefit Charge
SIR	Savings-to-investment Ratio
TRC	Total Resource Cost test

## Glossary

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**Affordable rate multifamily building:** Multifamily buildings with reduced rental rates. At least 25% of units must qualify as affordable to households earning 80% or less of the Area Median Income or State Median Income, or the building must qualify as a proxy for affordable housing as determined by NYSERDA.

**ASHRAE:** founded in 1894, ASHRAE is a building technology society with more than 54,000 members worldwide. The Society and its members focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry. Formerly known as the American Society of Heating, Refrigerating, and Air Conditioning Engineers.

**ENERGY STAR® Assisted Multifamily Program (AMP):** The NYSERDA pilot predecessor to MPP, AMP provided a range of technical and financial incentives to affordable multifamily properties in New York State to improve the energy efficiency and energy management of these buildings, while reducing energy cost burdens on low- and moderate-income tenants. Participants in AMP received the ENERGY STAR® label (see ENERGY STAR). AMP was active between July 2005 and December 2006, before MPP version 1 began in January 2007.

**Benchmarking:** The process of comparing a building's energy performance to its energy performance in the past or to the energy performance of a similar building. In MPP, this process is typically used for existing building projects.

**Building energy modeling/simulation model of energy usage:** The process of using computer-based tools to create a simulation model of building energy usage and identify energy savings attributable to the building design and components. In MPP, it is used primarily in new construction and gut rehab projects.

**Building Performance Institute (BPI):** Develops standards for energy efficiency retrofit work, professional credentials for individuals, and accreditation for contracting companies. It also serves several test centers for developing and refining building standards.

**Building Performance Institute's Multifamily Building Analyst Certification:** Certifies individuals to apply building-as-a-system fundamentals to diagnose problems and improve the performance of larger, more complex residential structures (such as multifamily buildings).

**Causal mechanism (for Spillover):** A description of how program operations, implementers, or participants may have caused or influenced participants or nonparticipants to install additional energy efficiency measures outside of the program. Possible causal mechanisms include positive customer experiences with installation of program measures, program media that reach nonparticipants, program-

sponsored calculation tools, conversations with program participants or implementers, or increases in the number of firms that offer more efficient systems or efficiency assessment services.

**Commissioning services:** A systematic quality assurance process to verify that building systems are operational and perform interactively according to the design intent and owner requirements.

**Comprehensive Residential Information Database (CRIS):** A project database that contains project and site data, and is managed by an implementation contractor. Program staff, Partners, and market actors can upload project data to the database through portals, and program staff can access individual project data and summary dashboard reports through a web-interface. This relational database contains data tables with information on project savings and measures installed, project site characteristics, and project application and project progress.

**Cost of energy savings:** The dollar value of energy savings (see Energy savings below) over a specific timeframe.

**Dodge Report:** Dodge “Players” database produced by McGraw-Hill is a quarterly status report on major construction activity.

**Energy Aligned Clause (EAC):** A clause developed by New York City and the Urban Green Council to include in leases that allows landlords to raise the rent to pay for energy efficiency measures that save energy. The clause ensures that the rent increase will never be higher than the monthly savings in energy.

**Energy audit:** A professional inspection, survey, or analysis of energy flows to identify the best ways to improve energy efficiency in a building. Tools such as blower doors and infrared cameras are commonly used, but simulated models of energy usage are typically not performed in energy audits.

**Energy building codes or standards:** Federal, state, or local rules that specify a minimum acceptable level of safety, design, and operational requirements, including energy usage, for buildings.

**Energy Efficiency Portfolio Standard (EEPS) Electric Funds:** The Public Service Commission established the EEPS in June 2008. EEPS electric funds are paid by electric customers through a surcharge to the Systems Benefit Charge (SBC) on their utility bills. Collections from electricity customers are administered as an addition to the New York SBC. The funds were for the creation of fast-track programs and to augment SBC-funded energy efficiency programs, including authorizing New York utilities to offer energy efficiency programs for the first time since the late 1990s. In July 2009, the Public Service Commission ruled these funds could be used only to pay for electric efficiency measures that individually

pass the TRC.<sup>1</sup> Because NYSERDA's multifamily program had been funded by EEPS, but cost-effectiveness was being determined at the project level, this ruling resulted in the abrupt suspension of the multifamily program. Owners of buildings that heat with fuel oil may receive EEPS electric funding coupled with other non-EEPS funding sources identified by NYSERDA. EEPS II was authorized in October 2011 and runs through 2015.

**Energy Efficiency Portfolio Standard (EEPS) Gas Funds:** EEPS gas funds are paid by gas customers through a surcharge to the Systems Benefit Charge on their utility bills. These funds may be used only to pay for natural gas efficiency measures that individually pass the TRC.

**Energy Reduction Plan (ERP):** ERPs are a required step in participation in the multifamily program. They are drafted by Partners following the scoping session and energy audit, are used to 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. ERPs are sometimes referred to as, and are synonymous with, the "scope of work."

**Energy savings:** The amount of energy, in kilowatt-hours, saved through energy-efficient building design and/or equipment, compared to a baseline non-efficient building design and/or equipment.

**ENERGY STAR®:** An international standard for energy-efficient consumer products. It was created in 1992 by the U.S. Environmental Protection Agency (EPA) and the U.S. Department of Energy. Devices carrying the ENERGY STAR service mark, such as computer products and peripherals, kitchen appliances, buildings, and other products, generally use 20–30% less energy than required by federal standards. In addition, the ENERGY STAR program has developed energy performance rating systems for several residential, commercial, and institutional building types and manufacturing facilities. These ratings, on a scale of 1 to 100, provide a means for benchmarking the energy efficiency of specific buildings and industrial plants against the energy performance of similar facilities. The ratings are used by building and energy managers to evaluate the energy performance of existing buildings and industrial plants. The rating systems are also used by EPA to determine if a building or plant can qualify to earn ENERGY STAR recognition.

**Exhibit C:** This document is executed following acceptance of an energy reduction plan. It is the contract that specifies the work the building owner must complete to be eligible for incentives and the incentives NYSERDA will pay to the building owner upon approved completion of that work.

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<sup>1</sup> Only measures that pass the *Total Resource Cost* test with a ratio of 1.0 or greater may receive Energy Efficient Portfolio Standard (EEPS) funding, and the total scope of EEPS the TRC test when program costs are added (\$0.22 per EEPS incentive dollar).

-eligible measures must al

**Existing building upgrade or retrofit:** Multifamily projects in which modifications are made to an existing multifamily building after it has been constructed and potentially placed on the market for tenants. Modifications can be upgrades to the building's existing energy-related components (for example, cooling, heating, shell and insulation, appliances) or retrofitting most of the building or parts of the building to be more energy efficient.

**Fast Track Path:** A more streamlined program option for existing multifamily buildings with 5-49 units. The Fast Track path is completed with less administrative work than the Standard path, and incentives are received sooner in the project timeline, on average. Specifically, the Fast Track path has a less extensive and expensive assessment (uses an *Excel*-based auditing tool instead of a full-scale building model), is completed with less administrative work than the Standard path, does not have a 50% inspection (just 100% inspection), and incentives are paid all at once following 100% inspection (as compared to incremental incentive payments as in Standard path).

**Firm gas:** Firm gas refers to the non-interruptible rate of certain buildings that use natural gas as their primary space-heating energy source.

**Free rider savings:** Savings accrued by program participants who are likely to have installed energy efficiency measures at participating building sites in the absence of the program.

**Free riders:** Program participants who would have installed energy-efficiency measures or performed energy-efficient activities at participating sites in the absence of the program. (Note: NYSERDA's style for this is two words, no hyphen.)

**Free ridership:** A measure participation in the program by participants who would have installed energy-efficient measures and/or performed energy-efficient activities in the absence of the program.

**Green Jobs – Green New York (GJGNY):** A statewide program administered by NYSERDA to provide New Yorkers with access to energy assessments, installation services, low-cost financing for residential customers, and pathways to training for green jobs. Services are delivered in targeted communities through community-based organizations, which recruit residential, small business, nonprofits, and multifamily building owners into the assessment and financing programs. The funds are used to provide financing for existing buildings projects. Half of each loan amount for these projects is GJGNY funds. The loans are advanced by commercial banks that participate with NYSERDA in the program. New construction projects are not eligible for these loans.

**Gross savings:** Estimated program savings without consideration of attribution or spillover effects.

**Gut rehab:** Multifamily projects in which there is 1) a change of use and reconstruction of an existing building or space within, 2) construction work of a nature requiring that the building or space within be out



of service for at least 30 consecutive days, or 3) reconstruction of a vacant structure or space within. Building plans must be prepared and certified by licensed professional architects or engineers.

**“Hiatus”:** The temporary “hiatus” in MPP lasted from July 29, 2009 until September 2010. On July 24, 2009, the Public Service Commission issued an order saying EEPS funds could be used only to incentivize measures that were individually cost-effective, and NYSERDA made the choice to institute a hiatus to redesign the program. Previously, the multifamily program paid incentives for projects that were cost-effective at the project level even though a project may have included one or more measures that, taken alone, were not cost-effective. Thus, the program effectively lost all of its EEPS money and it was placed on temporary hiatus. The program came back in 2010 as version 4, which allowed only individually cost-effective measures. However, to save money and streamline, NYSERDA brought management of the Existing Buildings component of the program in-house, and away from TRC, where it has remained.

**Impact Team:** The team responsible for evaluating the impact MPP has had on program Partners and participants. The impact team also conducted a spillover analysis of non-MPP multifamily buildings in which Partners, MPP participants, and market actors indicated that energy-efficient measures were installed and/or energy-efficiency activities were performed without any incentives. The team is comprised of Wirtshafter Associates, Inc. and Itron, Inc.

**LEED building certification and design:** The Leadership in Energy and Environmental Design is a building program created by the U.S. Green Building Council to provide third-party verification of green buildings. Certification is earned through the Green Building Council and enables registered third parties to classify buildings as LEED approved.

**Market rate multifamily building:** Multifamily buildings with rates determined by the market for housing in an area.

**Measurement and verification (M&V):** The process of inspecting, testing, measuring, and verifying the energy usage and savings of components related to the building’s energy performance. The process occurs after a MPP project is 100% complete.

**Multifamily Performance Program (MPP):** A NYSERDA program available for multifamily buildings with five or more units and four or more floors. It provides property owners, builders, cooperatives, and condominium governing boards the expertise, technology, and incentives to permanently improve their building's energy performance through proven technologies. Market rate and affordable multifamily buildings, and new construction and existing building retrofits are all eligible for MPP participation.

**MPP Partner:** Partners are consultants that contract with MPP participants, like building owners and developers, to aid in this process of participating in the program. They establish a communication link between the participant and NYSERDA, develop an Energy Reduction Plan or scope of work to approve

and implement energy efficiency improvements or designs, provide cost estimates, conduct required inspections, and guide participants through the program processes.

**MPP-supported project:** A multifamily construction or retrofit project that has received or is receiving support or incentives from NYSERDA's MPP.

**Multifamily building:** A building with five or more units and four or more floors (such as apartments, condominiums, cooperatives, public housing) in which at least 50% of the space is residential.

**Net savings:** Gross savings less free-riders savings plus savings from spillover.

**New construction:** Multifamily projects that are in the planning or construction phase.

**New York State Energy and Research Development Authority (NYSERDA):** A public benefit corporation created in 1975 to help New York State meet its energy goals: reducing energy consumption and increasing energy efficiency, promoting the use of renewable sources, creating green jobs, and protecting the environment. It provides funding through several programs to meet these goals and collaborates with businesses, industry, governments, academia, public interest groups, and energy market participants.

**NYSERDA Existing Facilities Program:** A NYSERDA program that offers a portfolio of incentive opportunities to offset the costs of energy improvements in existing commercial and institutional facilities across New York State. EFP works with customers to implement a comprehensive strategy to realize verified energy savings through an integrated approach to cost-effective energy efficiency measures.

**NYSERDA Home Performance with ENERGY STAR:** A NYSERDA program for existing single family or two- to four-unit multifamily buildings to improve energy efficiency. It typically involves an energy audit, with efficiency recommendations, incentives to make the recommended upgrades, and certification.

**NYSERDA Low-rise Residential New Construction Program:** A NYSERDA program that supports the construction and purchase of energy-efficient New York ENERGY STAR® Certified Homes, offering recurring savings and greater value to homebuyers. Financial incentives are offered to participating builders who construct single-family homes or multi-unit residential projects that meet the New York ENERGY STAR Certified Homes standard. Income-qualified projects are eligible for additional incentives.

**NYSERDA New Construction Program:** A NYSERDA program that provides technical support to design teams and financial incentives to building owners involved in the construction of new, more energy-efficient structures in New York State. The intent of the program is to improve energy efficiency and green building practices, and permanently transform the way buildings are designed and constructed throughout the State.

**Partner:** MPP relies on a network of energy consulting firms, or Multifamily Performance Partners, with the qualifications to provide comprehensive energy efficiency services to assist MPP clients such as building owners, property managers, and developers. A potential Partner firm must have acted in a lead capacity on at least three multifamily projects for which a comprehensive energy efficiency scope of work was developed and fully implemented. (Partners that do not meet this qualification can provide an explicit plan for how they will transfer the experience they do have in the multifamily sector into their role as a Partner.) A Partner's role in the program is to guide clients through the program processes. They provide services that include application submission, facilitation of a project scoping session and site visit, benchmarking and energy modeling, development of an Energy Reduction Plan (ERP), execution of contract documents and invoices, and inspection of installed energy-saving measures.

**Partner Portal:** A password protected NYSEERDA website for MPP Partners to access resources to help train staff, stay current with program guidelines, and market their services. Resources include: program guidelines, documents, and templates; access to submit a project application; case studies; metrics on MPP submitted applications; links to important information from TRC, the implementation contractor, and the Building Performance Institute (BPI); marketing documents, tools, and ready-to-use presentations; comprehensive library of training information; an updated calendar of marketing activities; and links to software tools, information about tax credits, and special programs.

**PE/MCA Team:** The MPP Process Evaluation and Market Characterization and Assessment Team is responsible for conducting the process evaluation of versions 4 and 5 of MPP, establishing a market characterization of multifamily buildings in New York state, and assessing MPP's reach into the multifamily market. The team is comprised of Wirtshafter Associates, Inc. and Research Into Action, Inc.

**Performance Path with ENERGY STAR:** This path follows the requirements of the Environmental Protection Agency's (EPA) Performance Path, which necessitates that the building as a whole performs to a certain standard. It supports a customized, whole building approach to energy efficiency that leads a building to receive the ENERGY STAR label from the EPA.

**Performance Payment:** A bonus incentive for existing building projects of up to \$300 per unit that is awarded to projects realizing energy reduction savings of 20 percent or higher.

**Predominant Partner:** The MPP Partner that conducted more than twice as many jobs as the next most productive program Partner and accounted for one-third of the projects in the sample.

**Prescriptive Path:** Requires that each component of a building be built to a certain standard (for example, a component or measure-based approach to saving energy). There are two additional Prescriptive Path options: a Modified Prescriptive Path and an ENERGY STAR Prescriptive Path. *Modified:* Offers a faster option leading to exceptional building performance by incentivizing improvements implemented according to a prescribed list of energy saving options. This path is best suited for gut rehabs and historic buildings,

but is appropriate for all types of new construction. *ENERGY STAR*: Also offers a faster option leading to exceptional performance in buildings. It incentivizes improvements implemented according to a prescribed list of energy savings options that leads a building to receive the ENERGY STAR label from the Environmental Protection Agency.

**Regional Greenhouse Gas Initiative (RGGI):** Begun in 2005, RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce power sector CO<sub>2</sub> emissions. RGGI funds are receipts from each state's auctions of CO<sub>2</sub> allowances. For MPP, RGGI funds may provide incentives to repair and replace space and domestic-water heating systems as well as to install insulation, air sealing, and other building shell energy efficiency measures that reduce oil and propane energy use. RGGI funds may not be used to fund electric reduction measures. Like SBC funds (below), RGGI funding is limited to measures that are part of a scope of work that collectively have a savings-to-investment ratio (SIR) of 1.0 or greater.<sup>2</sup> For MPP, RGGI funding is available for fuel oil projects.

**Retro-commissioning services:** A process to identify improvements to existing buildings to optimize systems performance.

**Savings-to-Investment Ratio (SIR):** The cost of completing a measure, when compared to the energy savings accrued by a measure, determines the length of time for simple payback on the investment. The present value of the lifetime dollar savings for a measure divided by the cost of the installed measure yields the Savings-to-Investment Ratio (SIR). The entire scope of work must have an  $SIR \geq 1.0$ . The project cost used in this cost-effectiveness evaluation must include the fees charged by the Partner to provide the Program services, any associated feasibility studies and/or design fees, and the incremental costs of the proposed measures.

**Scope of work:** For purposes of the Multifamily Program, scope of work is synonymous with Energy Reduction Plan.

**Scoping session:** An onsite meeting with the NYSERDA Project Manager, participant, and MPP Partner to discuss the Program and the building, and to answer any questions before review of an ERP.

**Spillover (participant, nonparticipant, market actors):** A measure of installation or activities that occur because of a program, but which receive no program support. *Participant inside*: Participant inside spillover is savings beyond program savings from measures installed at sites that participated in the program but for which no program incentives were paid; *participant outside*: Participant outside spillover is

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<sup>2</sup> The cost of the scope used in this cost-effectiveness evaluation must include the fees charged by the Partner to provide the Program services, the costs of the proposed measures, any associated feasibility study, and/or design fees. Measures that are not cost effective individually may be included in the project scope of work if the overall  $SIR \geq 1.0$ .

savings from measures installed by participating builders at sites where no program supported projects occurred. *Nonparticipant*: Savings by nonparticipants from energy efficiency measures that were implemented as a result of program influences such as conversations with participants, business with implementation contractors, or other causal mechanism flowing from the program. *Market Actors*: occurs when the energy efficiency services and products incented by a program are provided in projects by market actors who are not involved in the program.

**Spillover ratio:** Spillover-related savings divided by gross program savings.

**Spillover savings:** The sum of savings from participant inside spillover, participant outside spillover, and nonparticipant spillover.

**Standard Path:** A program option for existing multifamily buildings, particularly for those with 50 or more units that do not qualify for the Fast Track path. The Standard path requires more assessment and administrative work than the Fast Track path (see Fast Track description).

**Systems Benefit Charge (SBC):** SBC funding is ratepayer funding provided through a surcharge on utility bills. The charge is applied to all customer bills, whether they receive service from a local utility or from a competitive supplier. The charge supports a comprehensive set of programs for residential, multifamily, low-income, and commercial and industrial customers, as well as research and development efforts in both the Commission's SBC and Energy Efficiency Portfolio Standard (EEPS) programs. Like RGGI funding, SBC funds are limited to measures that are part of a scope of work that collectively have a savings-to-investment ratio (SIR) of 1.0 or greater.

**Total Resource Cost test (TRC test):** The TRC test measures the overall economic efficiency of a demand-side-management program from the point of view of the utility and its ratepayers as a whole. The benefits calculated in the Total Resource Cost test are the avoided supply costs, the reduction in transmission, distribution, generation, and capacity costs valued at marginal cost for the periods when there is a load reduction. The avoided supply costs should be calculated using net program savings, that is, savings net of changes in energy use that would have happened in the absence of the program. For fuel substitution programs, benefits include the avoided device costs and avoided supply costs for the energy, using equipment not chosen by the program participant. The costs in this test are the program costs paid by the utility and the participants, plus the increase in supply costs for the periods in which load is increased. Thus all equipment costs, installation, operation and maintenance, cost of removal (less salvage value), and administration costs, no matter who pays for them, are included in this test. Tax credits are considered a reduction to costs in this test. For fuel substitution programs, the costs also include the increase in supply costs for the utility providing the fuel that is chosen as a result of the program. The TRC test is the most commonly used measure of demand-side-management cost-effectiveness since it provides an indication of whether the total costs to both the utility and the ratepayer are being reduced. A program, such as the

Multifamily Performance Program, is considered cost-effective if the benefits exceed the total costs incurred by the utility and the ratepayer.

**Technical Service Providers:** Market actors who work with the program to encourage customers to upgrade the efficiency of their industrial processes and building systems.

**Utility incentive programs:** Programs by electricity utility companies that provide support and incentives for energy efficiency. Projects receiving utility incentives are typically ineligible for NYSERDA incentives.

## Summary

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This report presents results from the Process Evaluation and Market Characterization and Assessment (PE/MCA) team's evaluation of the New York State Energy Research and Development Authority's (NYSERDA) Multifamily Performance Program (MPP) and characterization of the multifamily building market in New York State (NYS). MPP provides incentives and technical support to new construction and existing multifamily buildings in NYS with five or more units for achieving 15% energy savings. MPP recruits and relies upon a network of market actors, or MPP Partners, qualified to guide program participants – the multifamily building owners, developers, and managers – through program processes. NYSERDA MPP program staff, with assistance from staff at the implementation contractor, TRC Companies, Inc. (TRC), review the program's documentation submitted by Partners on behalf of participants to determine if multifamily buildings qualify for participation, to assist in developing energy reduction plans (ERP) for buildings, and to verify they achieve 15% or greater energy savings.

The primary objectives of this evaluation were: to provide a comprehensive understanding of current and emerging multifamily markets (e.g., market structure and market actors); to assess MPP's activities in versions 4 (September 2010 to July 2012) and 5 (July 2012 to present) of the program; to provide a baseline of market effects in the multifamily housing market; and to determine potential strengths and weaknesses of MPP's processes. The PE/MCA team used a two-stage approach to perform the evaluation. First, the team conducted a market characterization and assessment analysis using secondary data sources (e.g., New York State tax records, Comprehensive Residential Information Database (CRIS) data, Dodge data,<sup>3</sup> and other relevant market studies and literature) to determine the characteristics of the multifamily housing market in New York State and assess MPP's impacts. Second, the team collected and analyzed data from 21 program staff, 50 Partners, and 110 participants, as well as from 341 market actors (architects, engineers, energy efficiency consultants, and building contractors) who may or may not have had experience with MPP; in addition, the team also collected comparison data from 127 market actors in Pennsylvania, a neighboring state without extensive multifamily energy efficiency programs. Through the in-depth interviews and surveys, the PE/MCA team identified program strengths and weaknesses, and established a baseline of energy efficiency activity in the multifamily market.

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<sup>3</sup> Dodge "Players" database produced by McGraw-Hill is a quarterly status report on major construction activity. This project had Players data from most quarters from 2005 through 2012.

## Key Findings

### Market Characterization and Market Effects Findings

One of the primary objectives of this study was to establish a baseline for future multifamily market effects studies. Elements of this baseline include the following:

- The PE/MCA team used NYS tax and finance records and U.S. Census to identify that there are 132,491 properties with 162,610 multifamily buildings and 2,526,919 multifamily units in the NYSERDA service area.<sup>4</sup> Since its inception in 2005, MPP has reached less than 1% of all existing multifamily properties and 6.6% of all multifamily units in the State. Since 2005, 6,637 non-public buildings were issued permits for multifamily new construction projects. During that time, MPP treated or was in the process of treating 371 new construction projects, or approximately 5.6% of all multifamily buildings permitted between 2005 and 2013.<sup>5</sup>
- Of the total savings from versions 4 and 5, 4% of kWh and 1% of therms were invested in measures that reduced tenant bills, and 96% of kWh and 99% of therms were invested in measures that reduced common space or master metered bills.<sup>6</sup>

### Partners

- About half of Partners said that they joined MPP to either expand their businesses to include multifamily clients or to provide more comprehensive energy efficiency services to their existing multifamily clients.
- Half of Partners reported providing ERP-like services to their multifamily clients before they joined MPP. Since becoming a Partner, two-thirds of Partners reported an increase in inquiries for their MPP services, about half expanded their service territory, and about one-third added new employees.
- However, most of the Partners previously involved in multifamily work did projects that were less extensive than they are now doing under MPP. Only 22% of Partners involved in new construction projects and 36% of Partners involved in existing building projects said they had achieved 15% savings for at least one of their projects done before joining MPP.

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<sup>4</sup> The tax record data underreports units because tax records for 39% of multifamily properties are missing information on number of units. This study replaces tax data with U.S. Census American Community Survey 2008-2012 values for units.

<sup>5</sup> The 371 MPP new construction buildings may have contained some buildings that are public housing while the 6,637 new construction permits were for privately-owned buildings.

<sup>6</sup> It is noted, that CRIS currently credits all investments in shell measures as savings to common spaces; thus, not including air conditioning related tenant electricity savings. It is recommended that in the future shell measures be allocated more accurately to credit tenant savings when air conditioning is individually metered.



- Sixty-nine percent of responding Partners reported that they provided energy efficiency services to *non-MPP multifamily* clients after joining MPP.
- About two-thirds of responding Partners (64%) reported that their MPP status contributed to their ability to attract clients.

## Participants

- Forty percent of the respondents in the participant sample from CRIS said they had participated in MPP for at least one other project before participating with the specific version 4 or 5 project that was the subject of the interview. This occurred even though many such repeat participants were removed from the process sample.<sup>7</sup>
- A majority (56%) of participants engaged in an energy efficiency activity in their property before participating in MPP.
- Of these participants, 32% reported that they had had a comprehensive energy audit. One-third of participants with non-MPP properties rated themselves “very knowledgeable” about how to reduce energy use in these properties before they participated in MPP.
- Among participants who had completed projects, 23% had pursued additional efficiency measures at the MPP property after construction was complete.
- Among participants who owned or managed an existing building in New York State, 67% installed energy efficiency measures at a multifamily property after they became involved with MPP for the first time. Of these, 45% reported that their association with MPP or a Partner influenced their decision to implement additional energy efficiency measures.

## Market Actors

The intent of the market actor survey is to establish a baseline for market actors (architects, engineers, contractors, and energy efficiency consultants) providing ERP-like services to multifamily properties. Architect, engineer, and contractor market actors were selected from the Dodge data list of market actors, in the hopes that that list would be an efficient means of identifying the range of market actors involved in the multifamily sector. Only one quarter of Partners were found in the Dodge data, suggesting that the Dodge data likely does not represent the whole set of market actors. The results are limited to the Dodge

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<sup>7</sup> The participant list was split between the Impact team (all projects with ERPs before 1/1/12) and process team (all remaining projects). There was a search to ensure that companies with more than one project were not included in both lists. Because the Impact list was limited, any company appearing in both lists was given to the Impact team and not called by the Process team.

listed subset of market actors, and the PE/MCA team therefore recommends that another sample source be explored in any future evaluation of this market.

- Between 13% and 14% of MPP Partners and other NYS market actors, reported providing ERP-like services to most of the multifamily projects, compared to 12% in Pennsylvania (PA).<sup>8</sup>
- Overall, in NYS, 42% of market actors had worked in the multifamily sector in the past five years – significantly more than in PA (31%). This is not surprising given that 32.4% of housing units in NYS are multifamily, while only 11.1% of housing units in PA are multifamily.<sup>9</sup>
- Only 4% of NYS market actors reported always recommending all the energy-efficient measures and always providing an energy model when working on multifamily new construction. Five percent of NYS market actors reported always recommending all the energy-efficient measures and always performing all the energy audit activities when working in existing buildings.
- Slightly more than half of NYS market actors (53%) reported being aware of MPP and about one-fourth reported working on an MPP-supported project.
- Half of these market actors said that MPP increased the degree to which they promote energy efficiency to the multifamily sector.
- A large majority (82%) of NYS market actors said they observed multifamily developers, owners, or managers increasing their interest in making their buildings more energy-efficient and about half reported changing their services to meet this increased interest.

## Process Evaluation Findings

The review of the MPP logic model, features, and processes reveals a well-conceived and well-administered program with very few issues. Two factors make the design of multifamily programs more challenging than for other sectors: the landlord/tenant split incentive and the need to design a comprehensive program that works across traditional residential and commercial program sectors. To the credit of MPP and its staff, the program has many features that match or even define best practices among multifamily initiatives.

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<sup>8</sup> DPS consultants noted that the removal of Partners from the NYS market actor sample creates a dissimilar comparison between NYS and PA surveys. For this question only, a post-survey correction was made to include Partners in the analysis. That correction is not made to any of the other market actor responses, meaning that results are flawed. Leaving out Partners generally means that if Partners had not been removed, NYS values would be higher than reported here.

<sup>9</sup> A portion of the PA market actors working in multifamily were servicing NYS properties.

## Strengths

- MPP has not only designed a single program for commercial and residential accounts, but also for new and existing buildings.
- MPP is helping to transform the market by developing an industry of energy efficiency service providers that serve multifamily buildings.
- MPP's exceptional structure and management allow staff to plan strategically, set challenging goals, establish and implement effective communication links, track performance, and proactively address potential issues.
- MPP's strong communication processes include monthly "all-hands" meetings, which facilitate effective communication between program staff and outside contractors. Meetings foster a cohesive sharing of accomplishments and challenges, and exchanges of ideas to address specific program issues and program expansion. Task responsibilities appear to be clearly defined and delegated broadly among the staff.
- MPP's development and use of a real-time feedback survey process and strategic planning contribute to the program's success. Few other energy efficiency programs use either element.
- MPP has developed an effective organizational structure and support tools that make MPP a model for efficiency programs in all sectors. Quality Assurance/Quality Control (QA/QC) is sufficient without being burdensome. The program's marketing support, particularly the use of the Web to differentiate leads and to deliver targeted messages to prospective owners, is an innovative marketing tool with application to many types of programs.
- MPP has a well-conceived process for recruiting Partners, maintaining and supporting their involvement, overseeing their work, and supplying technical support as needed. Partners have direct access to program implementation contractors and staff who can answer program-related and technical questions.
- MPP annual summits, numerous training activities, marketing materials and website,<sup>10</sup> and other outreach and support services were very important to most Partners.
- MPP's senior staff involvement in the administration of projects is a large benefit to program administration. In addition to their primary responsibilities, most senior staff manage individual existing building projects. Through this close involvement with Partners and building owners/managers, all staff maintain real-world and real-time engagement in and awareness of the

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<sup>10</sup> <http://www.nysesda.ny.gov/Contractors/Find-a-Contractor/MPP-Locator-Maps.aspx>

program during each step of the process, from project development to application submission, energy reduction plan development and implementation, project completion, and payment of incentives.

## Opportunities

Partners shared some concerns about the program. Most of these – particularly concerns about excess paperwork – are common among energy efficiency programs, though there is still potential for some improvement. The MPP staff was aware of some of these concerns and had addressed a few of them, such as updating the Partner Portal and introducing a Fast Track path. The issues mentioned by multiple Partners were the following:

- The profitability of participating in MPP also is a serious issue for the program. The market is not yet developed enough to where most owners recognize the value of MPP services, and as a result, Partners need to invest large amounts of uncompensated time and money in educating owners. The two most successful Partners acknowledged that their MPP projects could not be profitable unless they used MPP to leverage additional work (project management and air sealing).
- Some Partners experienced delays in application sign-off and approval, and in ERP approval; a few also noted variation in approvals of applications. Partners reported that some of the delays were caused by challenges in getting access to utility data and into tenant spaces; and others were delays caused by owner or Partner and not MPP staff. Two of the more active Partners, whose projects had been managed by different MPP staff, said that reviews of their ERPs differed per the individual manager. Project management is just one of the responsibilities that project managers at NYSERDA and TRC performed for MPP. This increases the number of staff members who are engaged in project management, which in turn increased the training burden for the program, and made it more challenging for MPP staff to manage projects in a consistent manner.
- Partners were concerned about the level of detailed analysis and paperwork required in general, and particularly for the application and ERP. Most Partners said they were not accustomed to doing the required levels of energy modeling and analysis for a standard project to ensure the program provides comprehensive and reliable results. Nor had they used the tools supported by MPP, which several described as too complicated.
- Over half of all Partners (56%) reported that the MPP hiatus between July 2009 and September 2010 negatively affected their business and negated some of the market transformation that MPP was developing. About one-sixth of the Partners report experiencing significant project delays and about one-third lost both clients and projects. Partners had to inform clients about the hiatus, which made it more difficult to retain clients and maintain their trust after the hiatus. About half of the Partners suggested that the hiatus eroded their trust in the program and that the event had

lasting negative impacts. As a result, they had not pursued MPP projects as aggressively or recommended MPP to their clients as frequently.

- About half of all interviewed Partners (45%) were not actively working in MPP version 5. A few of the Partners were no longer active because of the hiatus. In addition, 55% of Partners inactive in version 5 reported that they could not make a profit recruiting and providing MPP services under the current payment structure; 45% said they were busy with non-MPP work, and 23% had had a problem with a previous MPP project and were no longer interested in participating.
- Partners commented that their MPP projects faced significant competition from utility programs that did not require at least a 15% reduction in energy use. For example, 12 Partners indicated that if incentives from another program covered more of the costs of the measures their client wanted, they would recommend these programs instead of MPP.
- Participants were sometimes unaware of or confused about the MPP processes. To some extent, this reflects the fact that Partners are sheltering participants from most of the program process responsibilities.<sup>11</sup>
- Only two Partners interviewed reported projects that made use of Green Jobs – Green New York (GJGNY) financing. Of the participants who sought any type of financing, more than-three quarters had either not heard of GJGNY or did not have sufficient information to apply for GJGNY financing.
- The four Partners who reported using the Fast Track path noted that it is more streamlined but not much “faster” than the Standard path.

## Recommendations

The NYSEDA MPP is an exemplary program compared to other multifamily programs in the U.S. This study revealed the following areas for improvements to the program and some recommendations that might address them.

### Conclusion 1: Energy Efficiency Opportunities Exist in Tenant Spaces

While a goal of the program is to achieve savings within tenant spaces, there are few mechanisms to ensure that participants overcome the many barriers to installing measures within tenant spaces.

- **Recommendation 1-A: Differentiate between and encourage improvements in tenant and common spaces.** Multifamily programs should more effectively differentiate energy-efficient

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<sup>11</sup> The website provides detailed information on all the MPP benefits and requirements. The owners lack of understanding is not because information is not available to them.

measures done in tenant spaces and that lower tenant bills from those done in common areas or in master metered areas that lower owners' bills. Acknowledging that there may be less opportunities that may come at a higher cost in comparison to common area improvements, where incentives are offered, programs could make the incentives for tenant space measures larger than those for measures in common spaces to provide this differentiation and encouragement of greater savings for tenants.

- **Recommendation 1-B: Consider using the energy aligned clause to mitigate the landlord/tenant split incentive barrier.** Multifamily programs may employ the energy aligned clause (EAC) developed by New York City (PlaNYC) and the Urban Green Council to help mitigate the landlord/tenant split incentive barrier. The EAC allows landlords to raise rents to pay for measures that save energy. The clause ensures that rent increases will never exceed the monthly energy savings. The program operator could develop an incentive structure that encourages projects, particularly new buildings, to include EACs as part of their leasing structure. The program operator also could consider facilitating the process by agreeing to serve as a neutral party to calculate or verify bill reductions.

## Conclusion 2: Greater Savings Can Be Achieved

The 20% performance incentive was highly successful for existing buildings. They encourage owners to go deeper. Increasing these incentives and extending them to new construction and publicizing results will help achieve greater savings for the program.

- **Recommendation 2-A: Consider encouraging projects to achieve savings greater than 15% in new construction.** Multifamily programs should consider creating graduated incentives for new construction building owners willing to save 20%, 25%, 30%, or more.
- **Recommendation 2-B: Consider special recognition for building owners achieving the highest levels of savings.** Giving a means for owners to distinguish their building from others is an important component of establishing a market for energy efficiency in rental properties. The more publicity that a program gives to truly efficient buildings, the quicker that market push can develop.
- **Recommendation 2-C: Work with PLANYC<sup>12</sup> to disseminate benchmarking results.** To date, benchmark data that would serve to help differentiate efficient and non-efficient apartment units has been unavailable to the program and to this evaluation.

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<sup>12</sup> PLANYC Green Building and Energy Efficiency is managed by the Mayor's Office of Long-Term Planning and Sustainability (OLTPS) see <http://www.nyc.gov/html/gbee/html/about/about.shtml>

### Conclusion 3: Many Potential Participants Are Not Currently Ready to Commit to the 15% Minimum Savings Requirement

Many potential participants find achieving 15% savings in one project to be a significant hurdle.<sup>13</sup> Offering more flexibility will allow more building owners and developers to enter the program, and encourage them to achieve additional energy savings once they are participating.

- Recommendation 3: Consider allowing gradual achievement of the 15% threshold and coordinating with utility incentives.** Setting tough minimum threshold levels is a positive step that makes sure that buildings are not just taking the easy steps; however, multifamily program administrators should consider allowing projects to achieve the 15% minimum more gradually. Under this revised process, the ERP plan could be achieved more gradually. If the plan included measures incentivized by other programs, these could count toward the 15% threshold. However, a Partner could not receive the program incentive until the sum of measures reaches the 15% threshold. The MPP incentive could also be reduced by any incentives already received from other sources. This approach has two major benefits: 1) it provides a means of coordinating NYSERDA programs with those offered by the utilities; a strategy that is consistent with the direction expressed in the recent NYDPS decision<sup>14</sup>; and 2) the more gradual and easily marketed approach provides a means for Partners to attract reluctant owners and managers.

### Conclusion 4: Increasing Market Adoption of Energy Efficiency in the Multifamily Sector Will Require More Educational Outreach to Owners

The current MPP is reaching the most informed and motivated owners, with the vast majority of the remaining multifamily property owners still unaware of or convinced that MPP services are worthwhile. Supporting owner education is a critical component of a market transforming strategy. Because owners have not traditionally invested in energy efficiency consultation services and rely primarily on vendor advice, they are reluctant to pay up front for services offered by MPP partners. Most commonly, the vendors provide free consultation service because they profit when equipment is purchased. The current program approach places the responsibility of marketing, outreach and recruitment primarily on Partners. Under the current model, the Partners are compensated for a portion of the audit expense and not directly compensated for providing marketing, outreach and recruitment services. This approach results in minimal profitability for the Partner firm and an unsustainable business model. A resulting consequence is that most Partners perform very little marketing of the program.

<sup>13</sup> There is a minority of building owners who recognize the MPP program benefits and are achieving 20% savings or higher, but the majority of owners have not reached that level of commitment to energy efficiency or trust in Partners ability to deliver.

<sup>14</sup> [http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/26be8a93967e604785257cc40066b91a/\\$FILE/ATTK0J3L.pdf/Reforming%20The%20Energy%20Vision%20\(REV\)%20REPORT%204.25.%2014.pdf](http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/26be8a93967e604785257cc40066b91a/$FILE/ATTK0J3L.pdf/Reforming%20The%20Energy%20Vision%20(REV)%20REPORT%204.25.%2014.pdf)

- **Recommendation 4: Expand marketing of program to multifamily property owners and managers.** Multifamily programs would benefit from expanding the marketing and outreach to multifamily property owners or property managers to educate them on the benefits of investing in energy consultation services. The program can assume responsibility for marketing and outreach efforts; or the program can continue to rely on Partners to promote the program. If a program chooses the latter, the incentive structure will need to be revisited to give Partners more compensation for undertaking marketing services. This compensation could be a direct payment for marketing services or a finder's fee for successful recruitment of new participants. This compensation should be gradually phased out as the market develops and more owners gain an appreciation for program services. If the program interventions change over time the concept of providing education and outreach to prop owners or managers should still be considered as a strategy for achieving market adoption of energy efficiency in the multifamily sector.



# 1 Introduction

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On June 23, 2008, the New York Public Service Commission (PSC) established the Energy Efficiency Portfolio Standard (EEPS) to develop and encourage cost-effective energy efficiency programs - the **New York Energy \$mart<sup>SM</sup>** programs – in an effort to achieve a 15% reduction in energy usage statewide by the year 2015.<sup>15</sup> EEPS funds are paid for by electric utility customers through a surcharge to the Systems Benefit Charge (SBC) on their utility bills. Utilities whose customers contribute to EEPS are Central Hudson Gas and Electric Corporation, Consolidated Edison Company of New York, Inc., New York State Electric and Gas Corporation, Niagara Mohawk Power Corporation d/b/a National Grid, Orange and Rockland Utilities, Rochester Gas and Electric Corporation, Corning Natural Gas Corporation, KeySpan Gas East Corporation d/b/a National Grid, Brooklyn Union Gas Company d/b/a National Grid NY, and National Fuel Gas Distribution Corporation. The New York State Energy Research and Development Authority (NYSERDA), a public benefit corporation established in 1975, administers the SBC and, later, the EEPS funds.

This report describes the results of the joint process evaluation and market characterization assessment of one of these programs, NYSERDA's Multifamily Performance Program (MPP). The report is based on findings from interviews and surveys with key program and implementation staff and market actors, and on a review of related literature and websites.

## 1.1 Description of the Multifamily Performance Program<sup>16</sup>

MPP is designed to address the needs of the multifamily sector by working with developers, building owners, and owners' representatives to make cost-effective improvements to the energy efficiency of buildings with five or more residential units located in the SBC territory in which NYSERDA operates. MPP is one of several initiatives NYSERDA is implementing through its EEPS funding stream.<sup>17</sup>

As a market transformation program, MPP emphasizes making permanent changes in the way multifamily buildings are constructed and maintained. The program theory assumes:

- As proficiency and capacity to construct and maintain energy-efficient multifamily buildings increase, there will be opportunities to affect building codes, improve baseline energy

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<sup>15</sup> Case 07-M-0548, EEPS, Order Establishing Energy Efficiency Portfolio Standard and Approving Programs (issued June 23, 2008).

<sup>16</sup> This section presents the Program as it complies with the directives of the July 24, 2009 *Order Approving Multifamily Energy Efficiency Programs with Modifications*, as modified in the December 23, 2009 Order, and by NYSERDA's *Supplemental Revision to System Benefits Charge (SBC) Operating Plan (2012-2015)*, February 15, 2013.

<sup>17</sup> This refers to all of New York State except the area served by PSEG Long Island (previously Long Island Power Authority).

performance, and encourage more stringent energy efficiency requirements for new and existing multifamily buildings across New York State.

- As building owners and managers experience the benefits of properly trained and certified building and systems technicians, demand for training and programs will grow.

The current multifamily program, MPP, consolidates several earlier NYSERDA multifamily initiatives. (Sections 1.1.2 and 1.1.3 describe the program's evolution.) The program offers separate components for new construction and existing buildings. Through this approach, MPP now addresses multiple market barriers by providing multifamily building owners and developers with a single, coordinated entry point for NYSERDA services. The new construction component is implemented by a competitively selected third-party contractor; NYSERDA's MPP staff implements the program's existing buildings component. Both components serve market-rate and affordable multifamily projects.

### 1.1.1 New Construction

The program's new construction component supports new construction and "gut-rehabilitation"<sup>18</sup> projects by providing technical and financial assistance for inclusion of energy efficiency considerations at the planning, design, and construction phases of these projects. Since MPP version 4, NYSERDA has offered two paths for new construction program participation: a Prescriptive path and a Performance path. The Prescriptive path incentivizes improvements from a list of defined measures. The Performance path supports a customized, whole-building approach to energy efficiency. Both paths are intended to produce buildings that meet the U.S. Environmental Protection Agency (EPA)'s ENERGY STAR<sup>®</sup> requirements.

To qualify for the Prescriptive path, a project must include EPA-approved measures that meet ENERGY STAR standards.<sup>19</sup> The Performance path also requires creating a model of the designed building and comparing it to a model based on American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) standards. The energy cost of the new construction model must use at least 15% less energy than the ASHRAE model. As this pathway follows the standards developed by the EPA, it can lead to the ENERGY STAR label for the building. Program version 5 also added a Modified Prescriptive path that is described in Section 1.1.5 (versions 4 and 5 program changes).

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<sup>18</sup> Gut rehabilitation projects are defined as one of the following three types of projects where a licensed professional architect or engineer has prepared and certified building plans: 1) change of use and reconstruction of an existing building or space within; 2) construction work of a nature requiring that the building or space within be out of service for at least 30 consecutive days; or 3) reconstruction of a vacant structure of space within.

<sup>19</sup> See [ENERGY STAR Qualified Homes, Version 3 National Program Requirements](#); see [ENERGY STAR Certified Multifamily High Rise Buildings](#) for buildings over five stories.

### 1.1.2 Existing Buildings

The program's existing buildings component requires each participant to benchmark the energy performance of the existing facility against a set of similar buildings in the EPA's ENERGY STAR database. The project team must develop an energy reduction plan (ERP) to identify measures that will reduce the building's overall energy use by 15% below the energy current use.<sup>20</sup>

To diminish the barrier for smaller buildings posed by the cost of developing an ERP, MPP version 5 added a Fast Track path to the existing buildings component in 2012. Buildings of fewer than 50 units that otherwise would qualify for MPP are eligible for the Fast Track path. Fast Track projects are not required to complete a simulation model for their ERPs.<sup>21</sup>

Table 1-1 provides an overview of major program steps by program path.

**Table 1-1. Program Steps by Path**

Project Step	New Construction		Existing Buildings	
	Prescriptive	Performance	Standard	Fast Track
Project Application	x	x	x	x
Scoping Session	x	x	x	x
Benchmarking/Modeling	x	x	x	x
1st incentive payment	ERP	ERP	ERP	Fast Track Tool
Inspection and 2nd incentive payment	Open Wall Inspection	Open Wall Inspection	50% Construction	50% Construction
Inspection and 3rd incentive payment	100% Construction	100% Construction	100% Construction	100% Construction
Performance Inspection (optional)			x	x

### 1.1.3 Performance Partners

MPP relies on a network of energy consulting firms called Multifamily Performance Partners ("Partners") to assist building owners by providing comprehensive technical and administrative services to program participants, independent of any equipment manufacturer or seller. Program participants must work with a Partner for each project.<sup>22</sup>

<sup>20</sup> The ERP expresses the proposed end-use energy savings for each energy efficiency measure as a percentage of total source energy consumption.

<sup>21</sup> NYSERDA, *Existing Buildings Program Guidelines*, Version 5, July 2012, p. 55.

<sup>22</sup> Program participants must select a Partner from the Program's network of Partners. These Partners are chosen to offer Program services by a review panel consisting of staff from NYSERDA, the Department of Public Service, and/or NYSERDA's MPP implementation contractor.

Partner services include:

- Developing a list of cost-effective energy efficiency measures a building owner can implement.
- Submitting project applications.
- Facilitating a project scoping session and site visit.
- Benchmarking.
- Energy auditing.
- Energy modeling.
- Developing an ERP.
- Executing contract documents and invoices.
- Conducting onsite inspections of energy-saving measures.

Partners use the program's benchmarking tools, ERP template, and various auditing software packages to determine the cost-effectiveness of measures, expected energy savings, installation costs, incentives, and payment milestones.

NYSERDA provides incentives to the building owner for projects that reduce energy use by the required 15% or more. If an approved ERP is unable to sufficiently document that the project will meet the 15% energy savings target, the participant is still eligible for the first of the program's incentive payments, which may pay up to 25% of the cost of performing the ERP.

Incentives are paid in three installments throughout a project: 1) at submission of the building model report or ERP documenting that the project will achieve a 15% energy reduction target; 2) at 50% of project completion; and 3) at 100% project completion.<sup>23</sup> The payment milestones for new construction and existing buildings projects are similar, but functionally different, due to differences between the retrofit and new construction processes.

For a new construction project, the first payment is based on the results and documentation from an energy model performed on the building, while the first payment for an existing building project is based on the submission and approval of an ERP that includes benchmarking results. The second payment for a new construction project is based on a midpoint open-wall inspection, while the second payment for an existing building project is based on the project Partner's verification that the project is 50% complete. The third payment for both types of projects is based on an inspection that verifies 100% completion.<sup>24</sup>

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<sup>23</sup> MPP version 5 added a fourth incentive payment for existing buildings, as described in Section 1.1.5: Versions 4 and 5 Program changes.

<sup>24</sup> From NYSERDA, *Existing Buildings Program Guidelines*, Version 5, July 2012; and *New Construction Program Guidelines*, Version 5, July 2012.

### 1.1.4 Program History

MPP was revised several times since its launch in 2007. Before MPP was supported by EEPS funding, it was an SBC program. After running as a pilot program for 18 months in 2005 and 2006, version 1 of MPP was rolled out for new construction projects in January 2007. In June 2007, existing building projects became eligible for the program. In June 2008, when MPP was in version 3, the New York PSC created EEPS.<sup>25</sup>

At the time EEPS was created, NYSERDA responded to the PSC's invitation to submit electric energy efficiency program proposals for EEPS funding by proposing three electric-only initiatives and a number of gas initiatives for the multifamily-building customer sector. In its June 24, 2009, Order,<sup>26</sup> the PSC approved, with modifications, two of NYSERDA's electric energy efficiency programs: Geothermal Heat Pump Systems, which NYSERDA discontinued as part of a program streamlining effort in 2012, and the Electric Reduction in Master-Metered Multifamily Buildings program, which is now a stand-alone program.

On July 29, 2009, NYSERDA suspended new applications for MPP and instituted a hiatus period in which staff redesigned the program to meet EEPS requirements. MPP returned as version 4 in July 2010, and began accepting new applications on September 23, 2010. Under versions 4 and 5, both individual measures and whole projects are required to pass the Total Resource Cost (TRC) test in order to receive EEPS electric and gas funding. Additionally, each project must result in energy savings of at least 15%.

### 1.1.5 Versions 4 and 5

The following sections describe changes that occurred with versions 4 and 5 of the program.<sup>27</sup> Those versions changed MPP incentives, internal processes, and program architecture. The incremental changes implemented by versions 4.1 and 4.2 of the program included a new spreadsheet tool and new simulation guidelines that offered "more reasonable" ways to model projects. Those changes and the larger changes implemented with version 5 reflect ongoing staff efforts to simplify participation by building owners and otherwise to increase program participation.

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<sup>25</sup> Case 07-M-0548, EEPS, *Order Establishing Energy Efficiency Portfolio Standard and Approving Programs*, June 23, 2008.

<sup>26</sup> 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.

<sup>27</sup> Changes that occurred with the Program's interim versions 4.1 and 4.2 are cumulatively addressed as version 4, and specifically mentioned only where they differ from version 5.

### 1.1.5.1 Incentive Changes

In May 2011 (version 4.2), MPP introduced a higher incentive schedule for the construction of new “green affordable housing.” Version 5 for existing buildings (July 2012) added a fourth incentive payment based on building performance that has no analog with new construction projects. Specifically, the performance payment is an incentive available to projects that achieve verifiable energy savings of 20% or more. Utility billing data one year after the retrofit was compared to pre-retrofit data to determine actual energy savings.<sup>28</sup>

Other version 5 incentive changes included higher incentives for all existing multifamily buildings, with substantially increased incentives for affordable-housing “firm-gas” buildings. “Firm gas” refers to the non-interruptible rate of certain buildings that use natural gas as their primary space-heating energy source.

### 1.1.5.2 Process Changes

Version 5 streamlined some of the program’s processes. The biggest of these changes was a consolidation of version 4’s ERP package of four documents to a two-document package. The version 4 package consisted of a model, a Microsoft *Excel*-spreadsheet data-analysis tool, a benchmarking tool, and a narrative description of existing conditions and measures. The redesigned ERP combines the data-analysis and benchmarking tools, and eliminates the narrative description, leaving two documents: a spreadsheet and a model.

The separate Fast Track tool, implemented in version 5, automates energy savings calculations for the new Fast Track path for existing buildings, as described below. Partners enter information about a Fast Track project that populates a table of the project’s energy savings. Staff reported the Excel tools are more complex than before, but make it easier for Partners to provide the information needed by the program and have reduced the time required to review ERPs.

Document reduction also occurred in another way. Before version 5, a separate contract (Exhibit C) accompanied notices to proceed with project implementation. Version 5 eliminated that separate document, instead creating a contract with the owner by incorporating the program’s terms and conditions from the application form into the notice to proceed.

Other process changes that occurred with version 5 were:

- Extension of the due date for ERPs from 60 days to 90 days from the date of the initial notice to proceed;

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<sup>28</sup> See Section 1.1.5.3 below for tables showing MPP incentives for both Program components.

- The addition of a requirement for confirmation of the availability and the encumbrance of funds for a project's incentives before sending a notice to proceed with project implementation; and
- Limiting the number of ERP revisions to one revision to encourage thorough work by Partners and shorten the overall review time; and
- Canceling and rejecting Partner' project applications that are incomplete to reduce the number of errors and omissions in applications.

### 1.1.5.3 Changes to Program Architecture

With one exception, program participation changes for existing buildings are different from those for new construction projects. Because of these differences, version 5 changes to the existing buildings component are addressed separately from changes to the new construction component. The version 5 change that applies to both components is the basis for calculating incentives. Incentives are now based on the number of dwelling units in the both new construction and existing buildings, rather than on building area, allowing owners, developers, and managers to determine the amount of the incentive for which their project is eligible before applying to the program.

#### Existing Buildings

To address version 4 concerns regarding participants "gaming the system", in which participants remove their projects from participating in MPP after receiving an audit incentive, version 5 shifted the incentive schedule to focus more on project implementation. Previously, a number of buildings in New York City participated in the program only to the limited extent of obtaining an audit, in part to comply with Local Law 87.<sup>29</sup> To address this, projects in existing buildings must now complete an approved ERP to receive an incentive. This change simplified the program as well, eliminating one of a project's incentive payments and the separate contract for the audit and the audit payment.

Otherwise, incentives for projects in existing buildings increased, including significantly increased incentives for affordable-housing firm gas buildings, and for buildings that exceed energy savings expectations. Specifically, incentives for existing multifamily housing increased from just over \$600 per apartment to up to \$1,000 per apartment, depending on the type of fuel used to heat the building and if it is affordable housing.

Version 5 also restored a performance or "bonus" incentive for existing buildings that existed under versions 1 through 3. This performance incentive awards projects realizing energy reductions of 20% or

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<sup>29</sup> Local Law 87 requires buildings of 50,000 gross square feet or larger to undergo a periodic energy audit and retrocommissioning.

higher up to \$300 per apartment. The energy savings are determined through a billing analysis one year after project completion.

Perhaps most importantly, version 5 responded to a barrier to participation for owners of smaller existing buildings. To reduce the cost of participation for otherwise qualified buildings with fewer than 50 units, NYSERDA created the Fast Track path. This alternative to the Standard participation path simplifies the participation process by eliminating the ERP requirement and its accompanying modeling costs. This approach, combined with the Fast Track tool (which is a substitute for modeling), offers an easier, more cost-effective process for identifying and implementing improvements in smaller buildings. Table 1-2 and Table 1-3 illustrate the MPP version 4 and 5 incentives for existing buildings, respectively.

**Table 1-2. MPP Version 4 Incentives for Existing Buildings**

Payment Schedule	Affordable Housing	Market-Rate Housing
Payment 1 (ERP & Document Approval):		
▪ Base incentive (up to 30 units)	\$5,000	\$2,500
▪ Base incentive (31-500 units)	\$10,000	\$5,000
▪ Incremental incentive (over 100 units)	\$20/unit	\$10/unit
Payment 2 (50% Completion)	Up to \$300/unit	Up to \$300/unit
Payment 3 (Substantial completion)	Up to \$300/unit	Up to \$300/unit

**Table 1-3. MPP Version 5 Incentives for Existing Buildings**

Payment Schedule	Affordable Housing		Market-Rate Housing	
	Firm Gas (per unit)	Non-Firm Gas (per unit)	Firm Gas (per unit)	Non-Firm Gas (per unit)
Payment 1 (ERP & Document Approval):				
▪ Fast Track (5-49 units)	N/A	N/A	N/A	N/A
▪ Standard Path (5-49 units)	\$100	\$80	\$70	\$50
▪ Standard Path (50 or more units)	N/A	N/A	N/A	N/A
Payment 2 (50% complete):				
▪ Fast Track (5-49 units)	N/A	N/A	N/A	N/A
▪ Standard Path (5-49 units)	\$400	\$320	\$280	\$200
▪ Standard Path (50 or more units)	\$500	\$400	\$350	\$250
Payment 3 (100% complete):				
▪ Fast Track (5-49 units)	\$1,000	\$800	\$700	\$500
▪ Standard Path (5-49 units)	\$500	\$400	\$350	\$250
▪ Standard Path (50 or more units)	\$500	\$400	\$350	\$250
Maximum Incentives	\$1,000	\$800	\$700	\$500
continued				



Payment Schedule	Affordable Housing		Market-Rate Housing	
	Firm Gas (per unit)	Non-Firm Gas (per unit)	Firm Gas (per unit)	Non-Firm Gas (per unit)
Performance Payment:				
▪ Tier 1 (20%-22%)			\$150	
▪ Tier 2 (23%-25%)			\$200	
▪ Tier 3 (26%-28%)			\$250	
▪ Tier 4 (29% or more)			\$300	

### New Construction

In 2011, the program began to offer a choice of two paths for new construction projects, a Prescriptive path and a Performance path. MPP staff anticipated that many projects would enter the program's Prescriptive path, but only a single project applied. In response, program staff asked developers why they were not undertaking projects through the Prescriptive path, and gained useful insights that resulted in the establishment of a third path for new construction projects under version 5: a Modified Prescriptive path. The Modified Prescriptive path provides some exceptions to required ENERGY STAR standards of the Prescriptive path, particularly for gut rehabilitation projects and historical buildings where work is not done to the walls of the structure. This path does not result in an ENERGY STAR label for the final project, but may earn the **New York Energy \$mart<sup>SM</sup>** label.<sup>30</sup>

Although the Modified Prescriptive path is appropriate for all types of new construction, the path was designed to accommodate idiosyncrasies of gut rehabilitation projects, especially of historic buildings. For such projects, developers experienced difficulty in meeting the building-envelope requirements of the Prescriptive path, either because of the building's historic status, or because the developers could not meet the added expense of those requirements without experiencing a substantial loss.

The guidelines for the Modified Prescriptive path are almost the same as those for the Prescriptive path, but have exceptions for gut rehabilitations when no work is done on the walls. Other lesser changes to Prescriptive path requirements, such as reduction of the boiler efficiency requirement for these projects, also occurred with creation of the Modified Prescriptive path. According to Comprehensive Residential Information Database (CRIS), during the first 12 months of this path's availability, 11 projects applied using this approach, according to CRIS. Table 1-4 and Table 1-5 show the MPP version 4 and 5 new construction incentives, respectively.

<sup>30</sup> NYSERDA, *New Construction Program Guidelines*, Version 5, July 2012, p. 3.

**Table 1-4. MPP Version 4 Incentives for New Construction**

Payment Schedule	Affordable Housing	Market-Rate Housing
Payment 1 (Modeling payment):		
▪ Performance Path	\$20,000	\$15,000
▪ Prescriptive Path	N/A	N/A
Payment 2 (Open-Wall payment)	\$1/ghsf <sup>a</sup>	\$1/ghsf <sup>a</sup>
Payment 3 (As-Build payment)	\$0.50/ghfs <sup>a</sup> minus 10% retainage	\$0.50/ghfs <sup>a</sup> minus 10% retainage
Payment 4 (Data-Release payment)	10% retainage from Payment 3	10% retainage from Payment 3

<sup>a</sup> ghsf = Gross Heated Square Footage

**Table 1-5. MPP Version 5 Incentives for New Construction**

Payment Schedule	Affordable Housing		Market-Rate Housing	
	5-49 units (per unit)	50 or more units (per unit)	5-49 units (per unit)	50 or more units (per unit)
Payment 1 (Modeling Payment):				
▪ Performance Path	\$300	\$200	\$225	\$150
▪ Prescriptive Path	N/A	N/A	N/A	N/A
Payment 2 (Open-Wall payment):				
▪ Performance Path	\$300	\$400	\$225	\$300
▪ Prescriptive Path	\$450	\$450	\$300	\$300
Payment 3 (As-Build payment):				
▪ Performance Path	\$600	\$600	\$450	\$450
▪ Prescriptive Path	\$450	\$450	\$375	\$375
Maximum Incentives	\$1,200	\$900	\$900	\$675

### 1.1.6 Program Funding

Throughout its evolution, MPP program funding has come from a variety of sources, including SBC, EEPS, Green Jobs Green New York (GJGNY), and the Regional Greenhouse Gas Initiative (RGGI). Currently, SBC funds used to fund MPP flow through EEPS while non-EEPS SBC funds are focused on moving new or underutilized technologies into the marketplace.<sup>31</sup>

<sup>31</sup> NYSDERDA, Technology and Market Development Operating Plan for 2012-2016, System Benefits Charge, December 22, 2011.

### 1.1.6.1 EEPS Funding

The EEPS II was authorized in October 2011 and runs through 2015. Changes to EEPS for version 5 of MPP include funding for the Fast Track path and, as of 2014, the elimination of the TRC test for individual measures. In addition, to be consistent with the EEPS 15% energy-reduction target, the program lowered its performance target from 20% to 15%. However, measures not eligible for EEPS funding could still be included in the scope of work to reach the 15% reduction target, but under version 4.0 of MPP, “advanced” measures, such as photovoltaic, solar thermal, sub-metering, wind, and cogeneration no longer were eligible for incentives and could not contribute to the 15% performance target.

### 1.1.6.2 SBC Funding

SBC funds were used in versions 1 through 3 for projects started between 2007 to July 2009. SBC funds were not directly used to fund MPP after version 3, but instead flowed through EEPS.

### 1.1.6.3 RGGI Funding

Begun in 2005, RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce power sector CO<sub>2</sub> emissions. RGGI funds are proceeds from each state’s quarterly auctions of CO<sub>2</sub> emissions allowances. For MPP, RGGI funds provide incentives to repair and replace space and domestic water heating systems, as well as to install insulation, air sealing, and other building envelope energy-efficiency measures that reduce oil or propane energy use. RGGI funds may not be used to fund electric or “firm gas” energy use reduction measures.

The intermittent nature of RGGI’s quarterly cash infusions from the auctions poses planning problems for MPP. RGGI’s available funds sometimes become exhausted, which requires MPP to put further program commitments on hold until RGGI funding again becomes available. For example, at the end of 2012, the program had a list of 38 buildings whose project applications had been approved, but for which a notice to proceed had not been issued because RGGI funds were unavailable.

### 1.1.6.4 GJGNY Funding

GJGNY funding comes from RGGI funds as authorized by New York State in the GJGNY Act of 2009, which was signed into law on October 9, 2009. GJGNY is a discrete, targeted use of RGGI funds, and its goals include:

- Promoting energy efficiency, energy conservation, and clean technologies.
- Reducing energy consumption and costs.
- Reducing greenhouse gas emissions.
- Supporting sustainable community development.

- Creating green job opportunities, including opportunities for emerging, unemployed, and displaced workforces.

GJGNY funds provide interest-free loans that pay a portion (7.5%) of the program's incentives. GJGNY funds also are used to supplement and leverage other funding sources. Specifically, they can provide a portion of the financing for existing buildings projects. Half of each loan amount for these projects, up to a loan total of the lesser of \$500,000 or \$5,000 per unit, can be GJGNY funds. The loans are advanced by commercial banks that participate with NYSERDA in the program. New construction projects are not eligible for these loans. Additionally, GJGNY funds are used to support program audits, which may provide an entry point for projects into MPP but there are too few GJGNY-funded MPP projects as of January 2014 to determine if this has been the case.

### 1.1.7 Program Budget

The MPP electric program's annual EEPS budget for 2012 through 2015 is \$13,897,207. The budget for affordable housing is roughly double the market-rate budget (Table 1-6). The annual projections represent actual paid (invoiced) funds. All EEPS funds are to be under contract and encumbered by the end of December 2015. For the four years, the electric program budget totals \$55,588,828.

**Table 1-6. MPP Electric Program Expenditures 2012-2015**

Source: NYSERDA, *Supplemental Revision to System Benefits Charge (SBC) Operating Plan (2012-2015)*, December 22, 2011, Revised February 15, 2013.

Budget Category	2012	2013	2014	2015	Total
<b>Market-Rate Housing</b>					
General Administration	\$392,619	\$392,619	\$392,619	\$392,619	\$1,570,475
Program Expenditures:	\$4,186,298	\$4,186,298	\$4,186,298	\$4,186,298	\$16,745,193
▪ Program Outreach, Education and Marketing	\$245,387	\$245,387	\$245,387	\$245,387	\$981,547
▪ Trade Ally Training	\$22,085	\$22,085	\$22,085	\$22,085	\$88,339
▪ Incentives and Services	\$3,428,053	\$3,428,053	\$3,428,053	\$3,428,053	\$13,712,213
▪ Direct Program Implementation	\$490,774	\$490,774	\$490,774	\$490,774	\$1,963,094
Program Evaluation	\$245,386	\$245,386	\$245,386	\$245,386	\$981,544
NYS Cost Recovery Fee	\$83,431	\$83,431	\$83,431	\$83,431	\$333,724
Total Market Rate Budget	<b>\$4,907,734</b>	<b>\$4,907,734</b>	<b>\$4,907,734</b>	<b>\$4,907,734</b>	<b>\$19,630,936</b>
continued					

Budget Category	2012	2013	2014	2015	Total
<b>Affordable Housing</b>					
General Administration	\$719,158	\$719,158	\$719,158	\$719,158	\$2,876,631
Program Expenditures:	\$7,668,021	\$7,668,021	\$7,668,021	\$7,668,021	\$30,672,085
▪ <i>Program Outreach, Education and Marketing</i>	\$449,474	\$449,474	\$449,474	\$449,474	\$1,797,895
▪ <i>Trade Ally Training</i>	\$40,453	\$40,453	\$40,453	\$40,453	\$161,812
▪ <i>Incentives and Services</i>	\$6,279,147	\$6,279,147	\$6,279,147	\$6,279,147	\$25,116,589
▪ <i>Direct Program Implementation</i>	\$898,947	\$898,947	\$898,947	\$898,947	\$3,595,789
Program Evaluation	\$449,473	\$449,473	\$449,473	\$449,473	\$1,797,892
NYS Cost Recovery Fee	\$152,821	\$152,821	\$152,821	\$152,821	\$611,284
Total Affordable Housing Budget	<b>\$8,989,473</b>	<b>\$8,989,473</b>	<b>\$8,989,473</b>	<b>\$8,989,473</b>	<b>\$35,957,892</b>
<b>Total MPP Electric Budget</b>	<b>\$13,897,207</b>	<b>\$13,897,207</b>	<b>\$13,897,207</b>	<b>\$13,897,207</b>	<b>\$55,588,828</b>

The annual EEPS budgets for the MPP gas program for the years 2012 through 2015 are \$20,466,028, including annual expenditures of \$6,852,117 for market-rate housing and \$13,613,911 for affordable-rate housing (Table 1-7). The four-year budget for the gas program totals \$81,864,112.

The combined electric and gas four-year MPP budgets for 2012 through 2015 total \$137,452,940, with combined annual budgets of \$34,363,235. NYSEDA plans to continue to coordinate and collaborate with appropriate parties to pursue available federal and state funding to support MPP activities as well.

**Table 1-7. MPP Gas Program Expenditures 2013-2015**

Source: NYSEDA, *Supplemental Revision to System Benefits Charge (SBC) Operating Plan (2012-2015)*, December 22, 2011, Revised February 15, 2013.

Budget Category	2012	2013	2014	2015	Total
<b>Market-Rate Housing</b>					
General Administration	\$548,169	\$548,169	\$548,169	\$548,169	\$2,192,677
Program Expenditures:	\$5,844,857	\$5,844,857	\$5,844,857	\$5,844,857	\$23,379,427
▪ <i>Program Outreach, Education and Marketing</i>	\$342,606	\$342,606	\$342,606	\$342,606	\$1,370,423
▪ <i>Trade Ally Training</i>	\$30,835	\$30,835	\$30,835	\$30,835	\$123,338
▪ <i>Incentives and Services</i>	\$4,786,204	\$4,786,204	\$4,786,204	\$4,786,204	\$19,144,817
▪ <i>Direct Program Implementation</i>	\$685,212	\$685,212	\$685,212	\$685,212	\$2,740,847
Program Evaluation	\$342,605	\$342,605	\$342,605	\$342,605	\$1,370,420
NYS Cost Recovery Fee	\$116,486	\$116,486	\$116,486	\$116,486	\$465,944
Total Market Rate Budget	<b>\$6,852,117</b>	<b>\$6,852,117</b>	<b>\$6,852,117</b>	<b>\$6,852,117</b>	<b>\$27,408,468</b>
continued					

Budget Category	2012	2013	2014	2015	Total
<b>Affordable Housing</b>					
General Administration	\$1,089,113	\$1,089,113	\$1,089,113	\$1,089,113	\$4,356,452
Program Expenditures:	\$11,612,667	\$11,612,667	\$11,612,667	\$11,612,667	\$46,450,668
▪ Program Outreach, Education and Marketing	\$680,696	\$680,696	\$680,696	\$680,696	\$2,722,784
▪ Trade Ally Training	\$61,263	\$61,263	\$61,263	\$61,263	\$245,052
▪ Incentives and Services	\$9,509,318	\$9,509,318	\$9,509,318	\$9,509,318	\$38,037,272
▪ Direct Program Implementation	\$1,361,391	\$1,361,391	\$1,361,391	\$1,361,391	\$5,445,564
Program Evaluation	\$680,695	\$680,695	\$680,695	\$680,695	\$2,722,780
NYS Cost Recovery Fee	\$231,436	\$231,436	\$231,436	\$231,436	\$925,744
Total Affordable Housing Budget	<b>\$13,613,911</b>	<b>\$13,613,911</b>	<b>\$13,613,911</b>	<b>\$13,613,911</b>	<b>\$54,455,644</b>
Total MPP Gas Budget	<b>\$20,466,028</b>	<b>\$20,466,028</b>	<b>\$20,466,028</b>	<b>\$20,466,028</b>	<b>\$81,864,112</b>

### 1.1.8 Research Objectives

The current evaluation is the third process evaluation and the second market characterization assessment (MCA) of MPP. The first process evaluation, completed in 2006, examined the existing Assisted Multifamily Program (a predecessor of the MPP) and the Multifamily Building Performance Program.<sup>32</sup> A second process evaluation of the newly restructured MPP (version 1), which combined earlier NYSEDA multifamily programs into a single program, occurred in 2007-2008. That evaluation addressed the start-up of the new combined program and tested the concept of establishing MPP Partners to serve as facilitators for multifamily building owners, managers, and developers.<sup>33</sup> An MCA study of the Assisted Multifamily Program was completed in 2005.<sup>34</sup>

The current process evaluation work focused on projects initiated, or that completed work for their second incentive payment, on or after January 1, 2012. More particularly, the focus was on projects initiated under version 4, which launched in September 2010, and version 5, which launched in July 2012.

<sup>32</sup> *Process Evaluation of the Multifamily Building Performance Program*, Research Into Action, Inc. June 2007.

<sup>33</sup> *Process Evaluation of the Multifamily Performance Program*, Research Into Action, Inc. April 2008.

<sup>34</sup> *Assisted Multifamily Program, Market Characterization, Market Assessment and Causality Evaluation*, Quantec, LLC, March 2005.

The evaluation plan identified seven market characterization and assessment, and process-related research objectives.<sup>35</sup>

1. Develop market estimates for the number of multifamily new construction, renovation, and remodel projects occurring annually in New York State.
2. Assess program effectiveness in attracting market-rate, as well as affordable housing projects from both new construction and existing buildings.
3. Assess program features, services, and benefits.
4. Document program progress and the effectiveness of program processes for new and existing buildings, and for market-rate and affordable housing projects.
5. Document the role of MPP in existing multifamily building projects.
6. Document the influence of MPP on new construction projects.
7. Provide measures of potential spillover attribution and free ridership from Partners and other market actors, and from participants.

The Process Evaluation and Market Characterization and Assessment (PE/MCA) team approached these research objectives through multiple channels, primarily through interviews with stakeholder groups, supplemented with document and database review.

### 1.1.9 Data Collection Overview

The main data collection activities for this evaluation by source were:

- **Program and implementation staff:** In-depth phone interviews with NYSERDA staff, program implementation contractors, program marketing contractors, and QA contractors.
- **Multifamily properties:** Surveys of property owners and managers onsite.
- **Multifamily Performance Partners:** In-person and in-depth phone interviews and phone surveys of Partners, including experienced or inexperienced, active or inactive, and eligible or permanently removed Partners. Responses to in-depth Partner interviews were used to inform the broader-reaching surveys with other Partners.
- **Participating owners and developers:** Phone surveys of program participants.

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<sup>35</sup> *New York State Process Evaluation Protocols, A Supplement to the New York State Evaluation Guidelines* Updated 2012, Johnson Consulting Group, January 2012.

- **New York market actors:** In-depth phone interviews with and phone surveys of architects, engineers, building contractors, and energy efficiency consultants. Responses to in-depth interviews were used to inform the broader-reaching surveys.
- **Market actors in a neighboring state:** Phone surveys of architects, engineers, building contractors, and energy efficiency consultants in Pennsylvania. This group was used as a comparison to market actors in New York to identify and measure differences in the impact of the MPP program on the broader market.
- **CRIS database review:** Database extracts on key variables.

Data for the process evaluation were collected primarily through phone interviews and surveys (Table 1-8). Program and implementation staff were surveyed first in order to document program steps and processes, and to identify researchable topics that would be valuable to program staff. Next, MPP Partners were interviewed, starting with Partners who were most experienced with the program. Through these interviews, Partners provided detailed information about program steps and processes, and feedback on the effectiveness of program processes and the impact of MPP on the broader market. The PE/MCA team gained MPP customers' perspectives through phone surveys of participating owners and developers. The PE/MCA team also conducted phone surveys of market actors to determine the role and impact of MPP on the multifamily market. The team compared responses from market actors in New York State with responses from market actors from Pennsylvania. MPP Partners and participants, and market actors (who identified non-MPP projects in which MPP-incented energy efficiency services were provided) were also interviewed by the team to determine spillover potential. The review of CRIS data supported these activities and provided detailed information on program status. CRIS data and data from secondary sources provided the basis for market characterization and assessment. Subsequent chapters present more details about the PE/MCA team's data collection activities.

**Table 1-8. MPP Process and Market Assessment Data Collection Activities**

Target Group	Estimated Population Size	Estimated Sample Size	Interviews Conducted	Surveys Conducted	Sampling Precision
Program & Implementation Staff & Contractors	>21	21	21	N/A	N/A
Non-MPP Multifamily Properties (Spillover Activity)	392	392	N/A	119	95/5
Multifamily Performance Partners	105	50	21	29	90/10
Participating Owners & Developers	285	110	N/A	110	90/10
New York Market actors (Architects, Contractors, Engineers, & Energy Efficiency Consultants)	~3,687	1,471	6	341	85/15
Pennsylvania Market actors (Architects, Contractors, Engineers, & Energy Efficiency Consultants)	~755	458	N/A	127	80/20



## 2 Market Characterization

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### 2.1 Introduction

This chapter provides a detailed accounting of the primary and secondary information on the multifamily sector in New York State (NYS). The PE/MCA team collected and analyzed information on the following subject areas:

- Existing Multifamily Buildings.
- Multifamily New Construction Activity.
- New York City (NYC) Benchmarking Data.
- Vacancy Rates.
- MPP Participation Data.

The analysis provides information disaggregated by upstate and downstate areas, county, and utility service territory. Detailed information on number of buildings, number of units, number of stories, and property valuation are included as available. This analysis included use of a geographic information system (GIS) to calculate distributions within utility service territories. The report includes many maps and tables at the statewide and county level. For readability, all county-level tables are found in Appendix D.

### 2.2 Existing Multifamily Buildings

Prior to this report, MPP staff and others lacked an accurate count of the number of multifamily buildings in the State. This study used available real estate tax records to develop accurate estimates of the existing multifamily sector. This section includes data on existing multifamily properties, buildings, and units in New York State in the following categories:

- **Data on Number of Properties**
  - Real estate tax statistics.
  - Number of stories.
  - Unit size.
  - Age of building.
- **Data on Number of Buildings**
  - Number of multifamily buildings.
  - Number of stories.
  - Unit size.
  - Age of building.

- **Data on Number of Units**
  - Number of multifamily units.
  - Number of units by number-of-stories class.
  - Number of units by unit-size class.
  - Number of units by age-of-building class.

### 2.2.1 Multifamily Real Estate Tax Statistics in New York State

The research team used tax records for NYC properties and tax records for the remainder of the State to develop a comprehensive picture of the multifamily sector. The City of New York Department of City Planning has copyrighted *The Primary Land Use Tax Lot Output* (PLUTO™) data files, which provide detailed tax records of each NYC property. For this analysis, the research team used PLUTO™ Release 12v2 and tax records valid through the second quarter of 2012. The PLUTO data are largely complete. Multifamily properties are identified by Land Use Categories: 02 – Multifamily Walk-Up Buildings, and 03 – Multifamily Elevator Buildings. Some of the walk-up buildings had only four units and were removed from the data set because the minimum number of units to qualify for MPP is five.

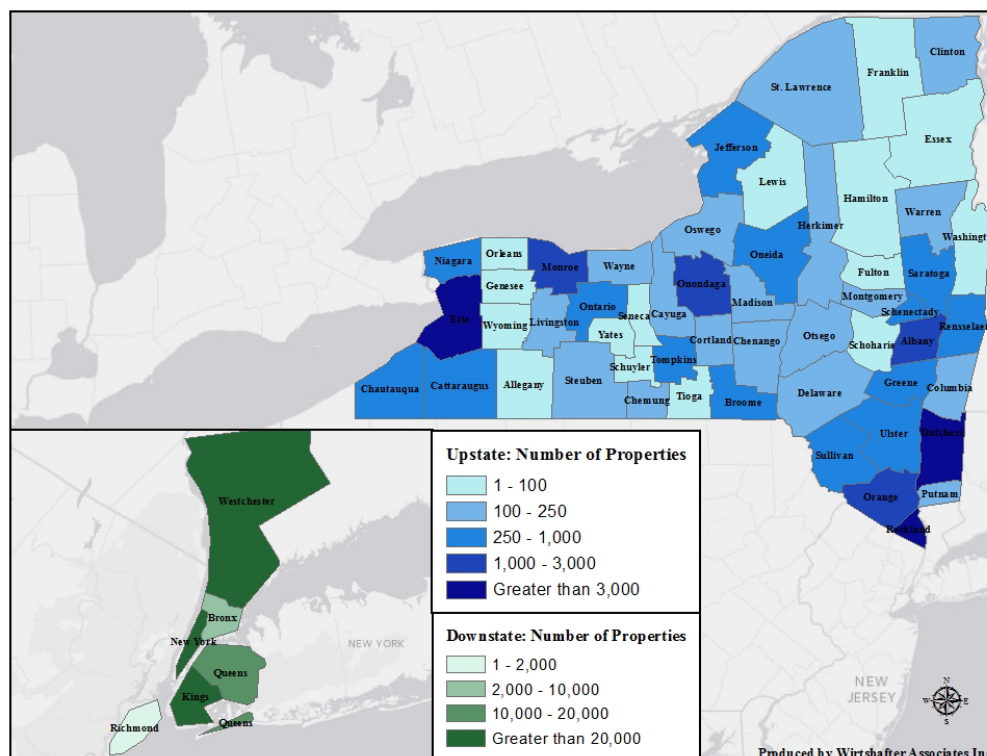
Tax records for the rest of the State were obtained by filing a Freedom of Information Act (FOIA) request with the New York State Department of Taxation and Finance. The request asked for all non-NYC multifamily property data.<sup>36</sup> The requested data were pulled from state records on March 6, 2013. For all of the counties, information included the square footage, number of stories, age, valuation, and ownership. Buildings with one to four units were removed from the data. Many counties did not consistently supply number of units, age of property, and/or number of stories. When records contained multiple entries for the same property, the PE/MCA team assumed that there were multiple buildings on the property. The team combined these data into a single property record with a new variable recording the number of buildings. Figure 2-1 shows the distribution of multifamily properties by county.

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<sup>36</sup> Apartment buildings were identified as buildings having a Property Class value of 410 or 411.

**Figure 2-1. Number of Multifamily Properties by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2013, March)



The two data sets were combined to provide information relevant to the MPP. Table 2-1 provides the summary statistics for New York State for the year 2012.

**Table 2-1. Multifamily Property Information by Area (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2013, March)

Area	Total Assessed Value (\$1,000)	Total Living Area sq. ft.	Number of Buildings	Number of Properties	Number of Units <sup>a</sup>
Upstate	\$10,740,007	181,026,634	39,690	32,018	287,842
Downstate	\$85,992,752	2,045,649,636	121,128	91,552	2,144,273
<b>Total MPP Area</b>	<b>\$96,732,759</b>	<b>2,226,676,270</b>	<b>162,610</b>	<b>123,570</b>	<b>2,432,115</b>
Long Island	\$706,666	7,699,835	9,093	8,921	7,422
<b>Total NYS</b>	<b>\$97,439,425</b>	<b>2,234,376,105</b>	<b>169,911</b>	<b>132,491</b>	<b>2,439,537<sup>b</sup></b>

<sup>a</sup> 39% of properties did not report number of units.

<sup>b</sup> An attempt is made here to calculate the actual number of units in the state. 39% of the properties in the tax data are missing units, but all of these are in upstate NY and Westchester County. The U.S. Census American Community Survey (ACS) 2008-2012 estimates there are 2,626,770 multifamily units in all of NYS. Subtracting out Suffolk (46,503) and Nassau (53,348) leaves 2,526,919 units in the NYSEERDA area. For this study, the ACS values are used throughout for number of multifamily units.

In Appendix D, Table D-1 displays various building statistics throughout the 62 counties in the State for the year(s) 2012.

## 2.2.2 Properties by Number-of-Stories Class

The NYC PLUTO™ data set contains information on the number of stories for each NYC multifamily building. For most of the rest of the state, the number of stories is provided, though there are a few isolated areas where data are not available. Each building was categorized into a number-of-stories class per the following criteria:

- Class 1: One to three stories.
- Class 2: Four or five stories.
- Class 3: Six to 10 stories.
- Class 4: 11 to 20 stories.
- Class 5: More than 20 stories.

Figure 2-2 shows the distribution of properties by number-of-stories class.

**Figure 2-2. Multifamily Properties by Number-of-Stories Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2013, March)

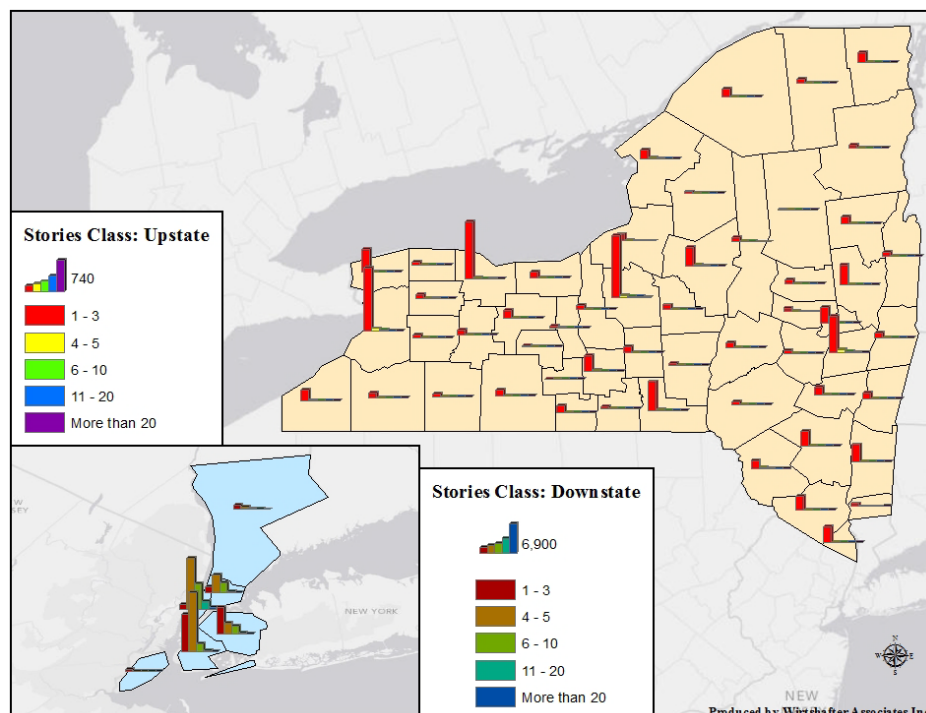


Table 2-2 displays a comparison of the number of properties by number-of-stories classifications. The data are summarized by the upstate, downstate, and Long Island areas of New York State. Some of the counties outside NYC did not thoroughly report number of stories. Westchester was one of those counties, and all but one of the 23,207 missing cases for downstate are from Westchester. Most of the multifamily properties in New York State are one to three stories. In fact, that category represents 40% of the buildings of known height across the entire MPP area (excluding Long Island), and 96% of the upstate and 28% of the downstate buildings of known height. In addition, the results also show that downstate New York has 780 properties that contain more than 20 stories, while there are only 12 such buildings in the upstate region.

**Table 2-2. Multifamily Properties by Number-of-Stories Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	More than 20 Stories	Total
Downstate	23,207	19,242	33,211	12,494	2,618	780	91,552
Upstate	17,714	13,794	324	121	53	12	32,018
Long Island	8,697	177	12	34	0	1	8,921
<b>Total NYS</b>	<b>49,618</b>	<b>33,213</b>	<b>33,547</b>	<b>12,649</b>	<b>2,671</b>	<b>793</b>	<b>132,491</b>

In Appendix D, Table D-2 displays the number of properties by number-of-stories class in the 62 counties of New York State for the year 2012.

### 2.2.3 Properties by Unit-Size Class

Table 2-3 displays the number of properties by unit-size class in downstate, upstate, and Long Island. The unit-size classes shown in the table are:

- 5 to 10 units.
- 11 to 20 units.
- 21 to 50 units.
- 51 to 100 units.
- 101 to 200 units.
- 201 to 500 units.
- Greater than 500 units.

As with the number of stories, a number of counties – including Westchester – failed to report the number of units.

**Table 2-3. Multifamily Properties by Unit-Size Class (2012)**

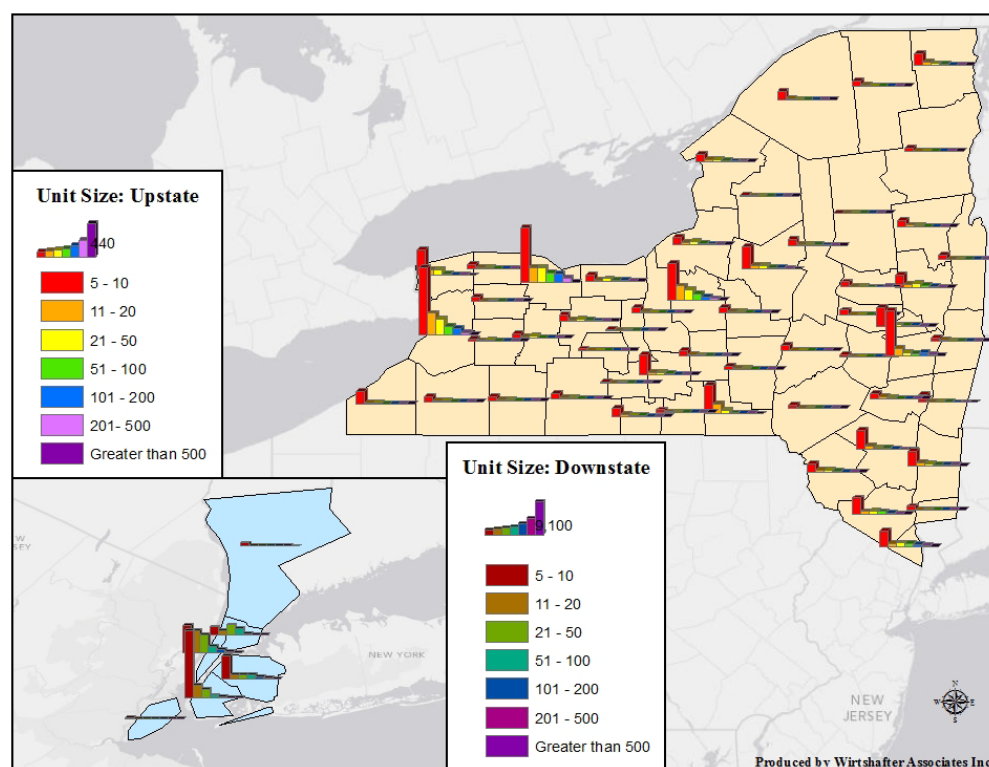
Sources: PLUTO™ V12v2 ©NYC Department of City Planning and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Downstate	23,525	35,411	12,171	11,439	5,504	2,128	1,090	284	91,552
Upstate	19,609	7,814	1,787	1,480	699	453	169	7	32,018
Long Island	8,730	71	37	29	36	15	3	0	8,921
<b>Total NYS</b>	<b>51,864</b>	<b>43,296</b>	<b>13,995</b>	<b>12,948</b>	<b>6,239</b>	<b>2,596</b>	<b>1,262</b>	<b>291</b>	<b>132,491</b>

Figure 2-3 shows the distribution of properties by unit-size class for the year 2012.

**Figure 2-3. Multifamily Properties by Unit-size Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



In Appendix D, Table D-3 displays the number of properties by unit-size class for the 62 counties of New York State for the year 2012.

### 2.2.4 Properties by Age-of-Building Class

Table 2-4 shows a comparison of the downstate, upstate, and Long Island areas by the number of properties by age-of-building class. The age categories shown in the table are:

- Built before 1900.
- Built from 1900 to 1949.
- Built from 1950 to 1974.
- Built from 1975 to 1999.
- Built from 2000 to 2012.

According to Table 2-4, the majority of properties in downstate New York were built between 1900 and 1949. It is difficult to know the average age of upstate multifamily buildings because records for 56% of them did not contain an age value.

**Table 2-4. Multifamily Properties by Age-of-Building Class**

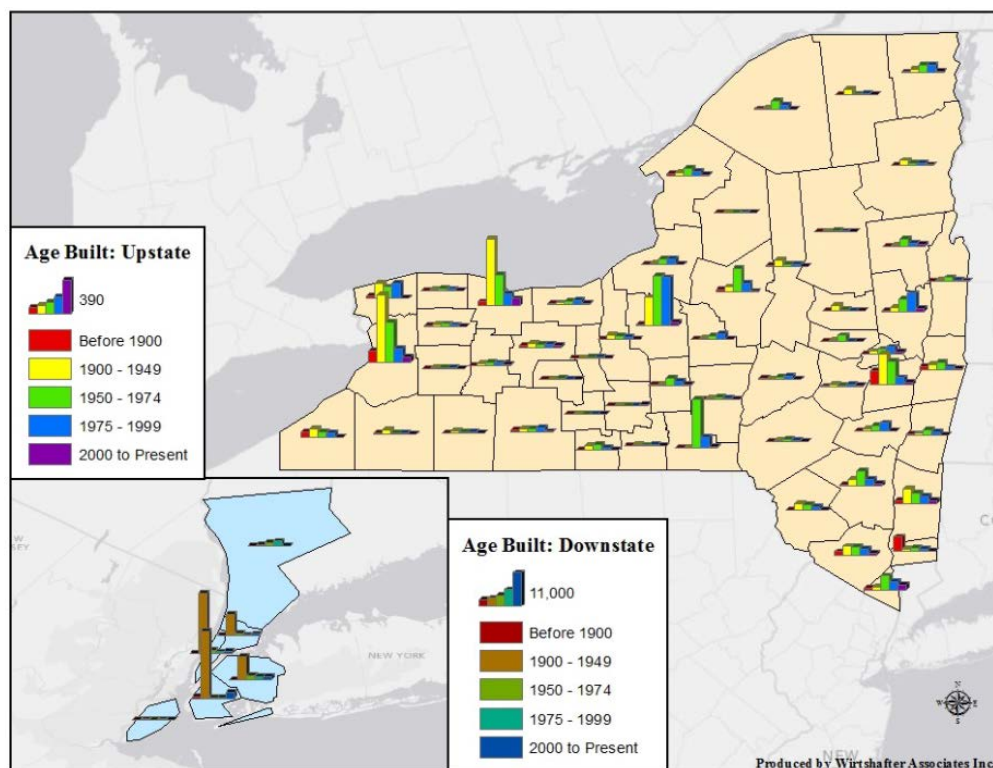
Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2012	Total
Downstate	21,423	925	55,717	4,995	4,029	4,463	91,552
Upstate	18,095	1,032	4,135	4,958	3,173	665	32,058
Long Island	8,643	0	60	111	91	16	8,921
<b>Total NYS</b>	<b>48,161</b>	<b>1,957</b>	<b>59,912</b>	<b>10,064</b>	<b>7,293</b>	<b>5,144</b>	<b>132,531</b>

Figure 2-4 shows the distribution of multifamily properties across New York State by age-of-building class.

**Figure 2-4. Multifamily Properties by Age-of-Building Class**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department



In Appendix D, Table D-4 shows the number of properties by age-of-building class for the 62 counties of New York State.

### 2.2.5 Number of Multifamily Buildings by County (2012)

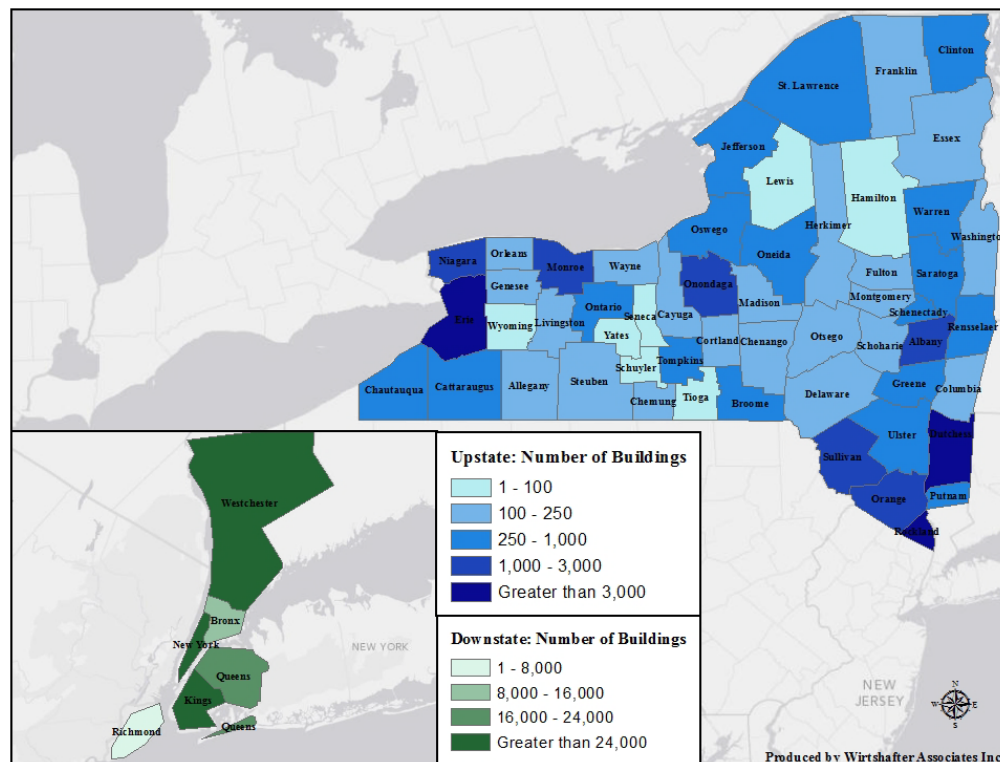
The next set of tables displays the number of buildings across the State for 2012. A single tax property sometimes includes multiple buildings.

Figure 2-5 shows the distribution of multifamily buildings across New York State.



**Figure 2-5. Number of Multifamily Buildings by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



### 2.2.6 Buildings by Number-of-Stories Class

Table 2-5 shows a comparison of the number of buildings in downstate, upstate, and Long Island according to number-of-stories class for 2012. As the table shows, there was no information about the number of stories for almost 30% of the buildings in New York State.

**Table 2-5. Multifamily Buildings by Number-of-Stories Class (2012)**

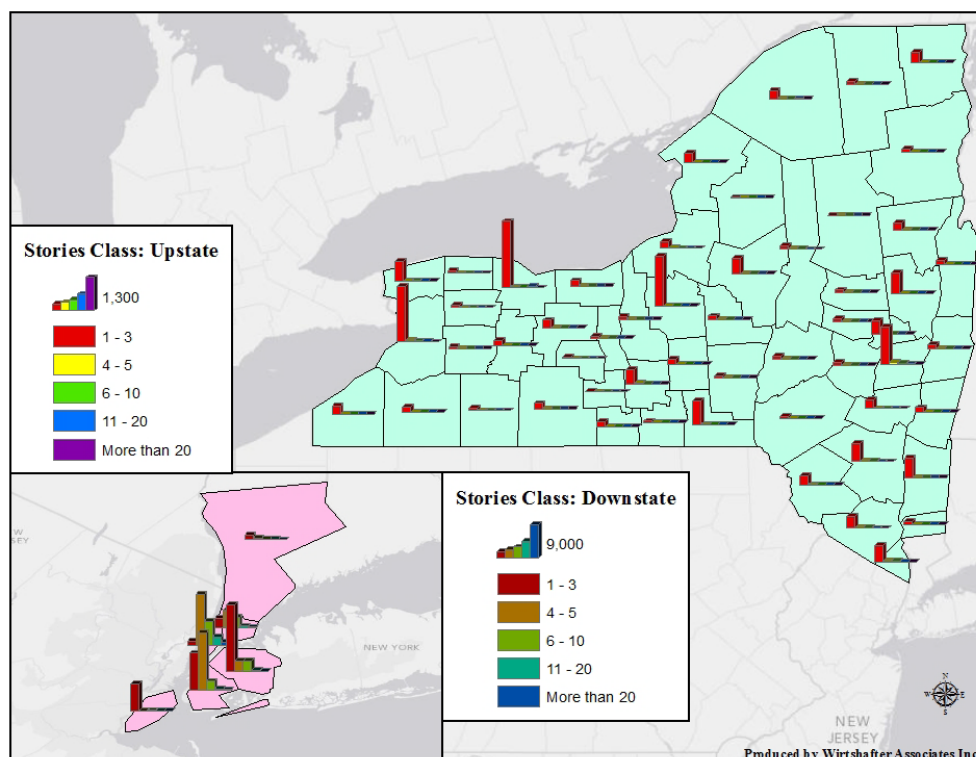
Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	More than 20 Stories	Total
Downstate	23,388	40,391	37,286	15,158	3,678	1,227	121,128
Upstate	17,937	21,002	423	183	115	30	39,690
Long Island	8,736	293	23	38	0	3	9,093
<b>Total NYS</b>	<b>50,061</b>	<b>61,686</b>	<b>37,732</b>	<b>15,379</b>	<b>3,793</b>	<b>1,260</b>	<b>169,911</b>

Figure 2-6 shows the distribution of multifamily buildings by number-of-stories class for the year 2012.

**Figure 2-6. Multifamily Buildings by Number-of-Stories Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



In Appendix D, Table D-5 displays the number of buildings by number-of-stories class for each New York State county for the year 2012.

## 2.2.7 Buildings by Unit-Size Class

Table 2-6 displays a comparison of the number of buildings by unit-size class in downstate, upstate, and Long Island for the year 2012. Within the MPP program area, 41% of the buildings of known unit size are in the five- to 10-unit size class. As the table shows, there was no information about the number of units for more than 30% of the buildings in New York State.

**Table 2-6. Multifamily Buildings by Unit-Size Class (2012)**

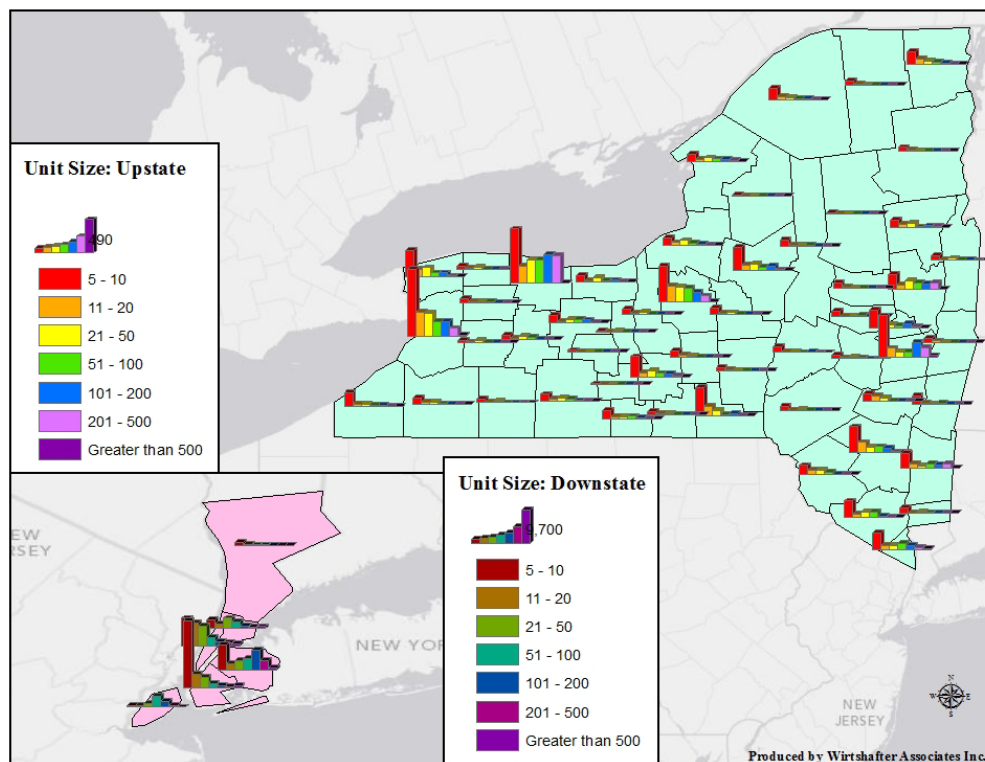
Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Downstate	23,539	38,573	14,172	15,767	11,980	9,936	4,897	2,264	121,128
Upstate	20,516	9,074	2,628	2,751	1,912	1,717	1,036	56	39,690
Long Island	8,830	92	41	40	61	23	6	0	9,093
<b>Total NYS</b>	<b>52,885</b>	<b>47,739</b>	<b>16,841</b>	<b>18,558</b>	<b>13,953</b>	<b>11,676</b>	<b>5,939</b>	<b>2,320</b>	<b>169,911</b>

Figure 2-7 shows the distribution of multifamily buildings by unit-size class for the year 2012.

**Figure 2-7. Multifamily Buildings by Unit-Size Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



In Appendix D, Table D-6 shows the number of buildings by their unit-size class for the 62 counties of New York State for the year 2012.

### 2.2.8 Buildings by Age-of-Building Class

Table 2-7 shows the number of buildings by age-of-building class for the downstate, upstate, and Long Island areas of New York State for the year 2012. The age categories shown in Table 2-7 includes buildings built before 1900, from 1900 to 1949, from 1950 to 1974, from 1975 to 1999, and from 2000 to 2012.

According to Table 2-7, most of the buildings in downstate New York (66% of known age) were built between 1900 and 1949. In upstate New York, building age was not available for about 53% of the buildings. Per the reported data, most of the upstate multifamily buildings were built between 1950 and 1974.

**Table 2-7. Multifamily Buildings by Age-of-Building Class (2012)**

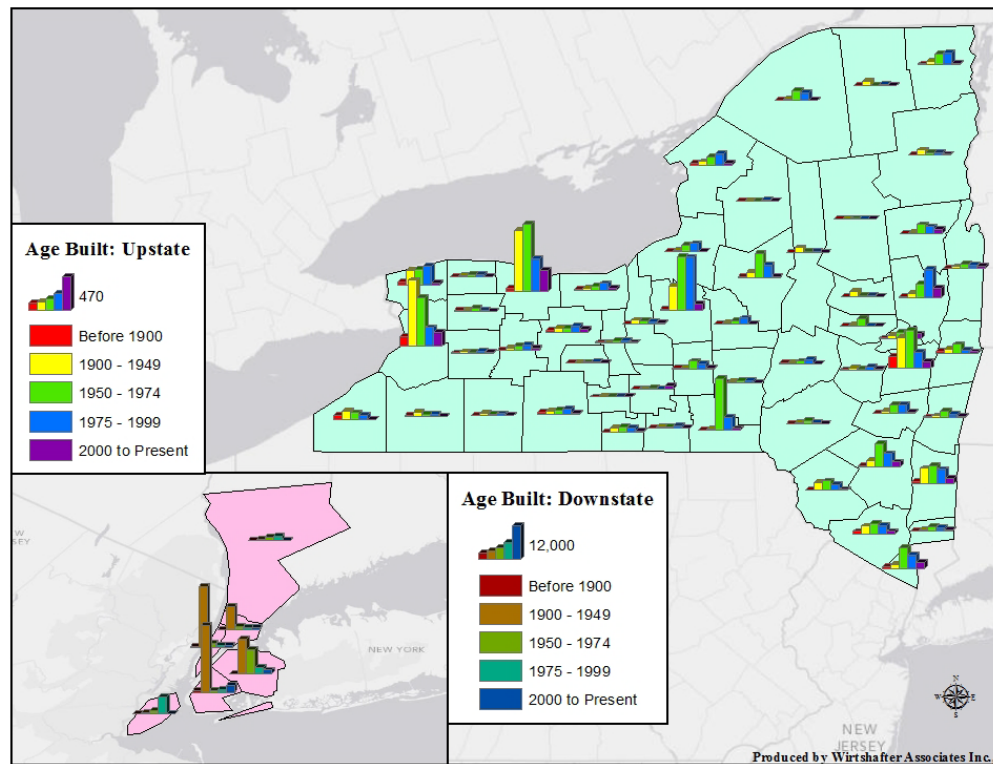
Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2012	Total
Downstate	21,428	1,162	66,122	14,304	12,432	5,680	121,128
Upstate	18,583	946	4,836	7,889	5,686	1,750	39,690
Long Island	8,649	0	103	162	161	18	9,093
<b>Total NYS</b>	<b>48,660</b>	<b>2,108</b>	<b>71,061</b>	<b>22,355</b>	<b>18,279</b>	<b>7,448</b>	<b>169,911</b>

Figure 2-8 shows the distribution of buildings by age-of-building class.

**Figure 2-8. Multifamily Buildings by Age-of-Building Class**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department



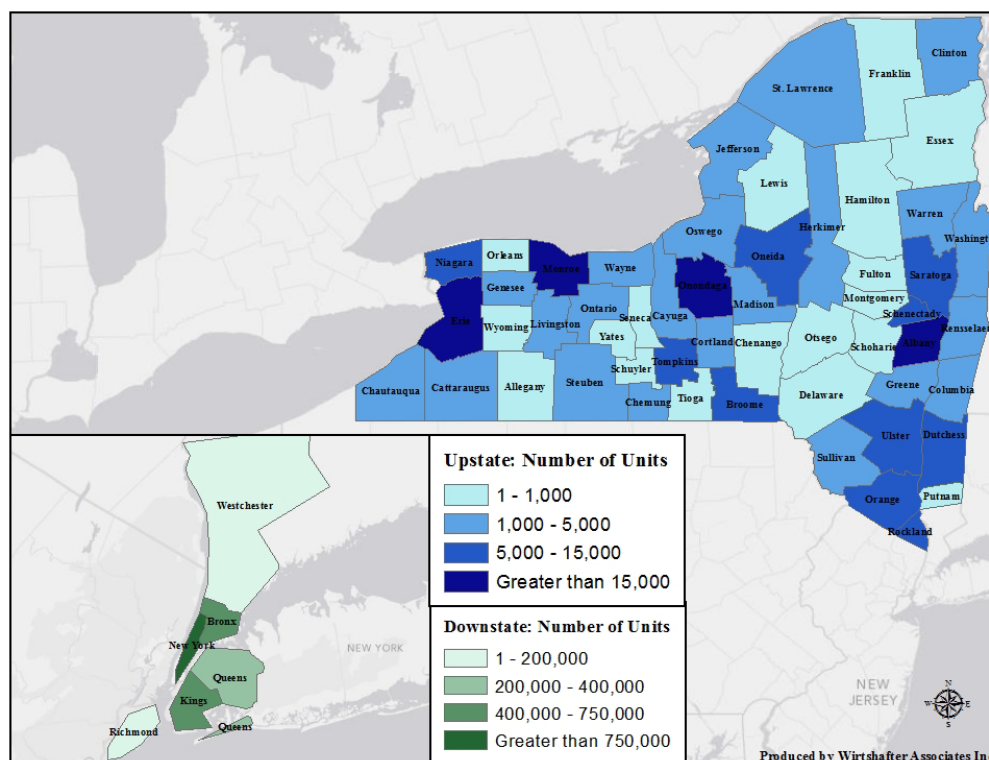
In Appendix D, Table D-7 shows the number of buildings in terms of age for the 62 counties of New York State.

### 2.2.9 Number of Multifamily Units

Most of the tax records had information for number of units. Figure 2-9 shows the distribution of units across New York State for the year 2012.

**Figure 2-9. Multifamily Units by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



### 2.2.10 Number of Units by Number-of-Stories Class

Table 2-8 compares the number of units by number-of-stories class in the downstate, upstate, and Long Island areas of New York State for the year 2012. The table and following map rely upon tax data for Westchester and upstate counties, where 39% of properties do not have data. The stories classes shown in this comparison are: one to three stories, four to five stories, six to 10 stories, 11 to 20 stories, and more than 20 stories. Results show that in downstate New York, one-third of all units are in buildings with six to 10 stories. In the upstate area, 88% of the units are in buildings of three stories or less.

**Table 2-8. Multifamily Units by Number-of-Stories Class (2012)**

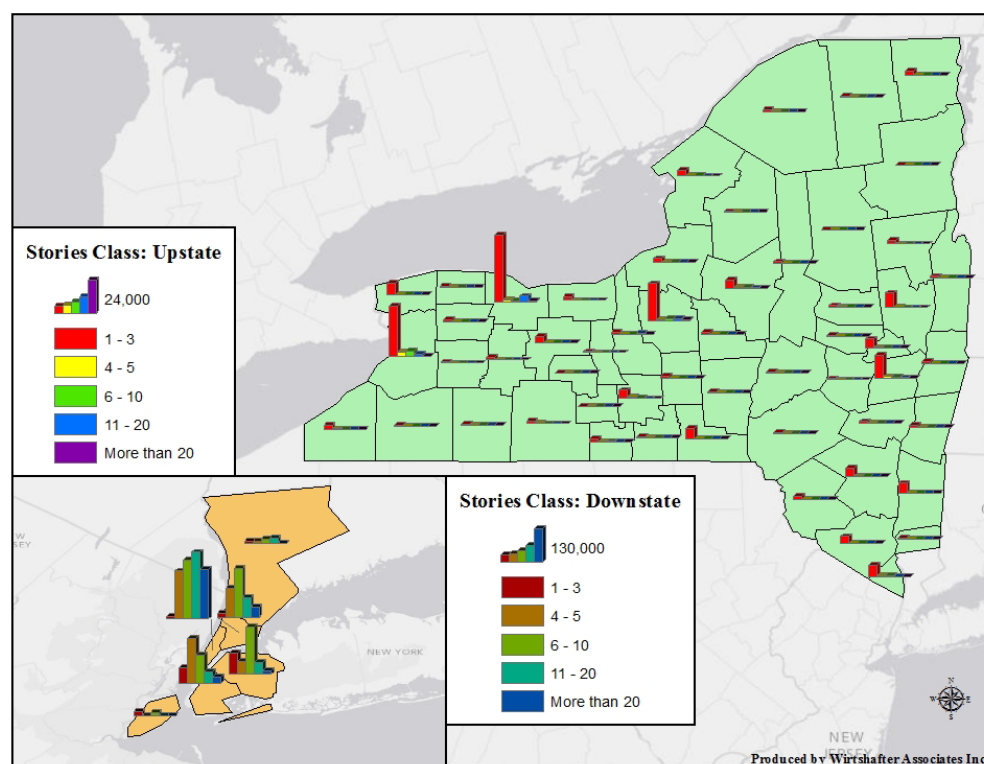
Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	More than 20 Stories	Total
Downstate	6,881	190,326	521,890	724,314	439,434	261,428	2,144,273
Upstate	3,570	251,361	12,173	10,940	8,260	1,538	287,842
Long Island	104	3,076	594	3,640	0	8	7,422
<b>Total NYS</b>	<b>10,555</b>	<b>444,763</b>	<b>534,657</b>	<b>738,894</b>	<b>447,694</b>	<b>262,974</b>	<b>2,439,537</b>

Figure 2-10 shows the distribution of units by number-of-stories class for the year 2012.

**Figure 2-10. Multifamily Units by Number-of-Stories Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



In Appendix D, Table D-8 presents number-of-units data for the 62 counties of New York State by the number-of-stories class for the year 2012.



### 2.2.11 Number of Units by Unit-Size Class

Table 2-9 compares the number of units by unit-size class for the downstate, upstate, and Long Island areas of New York State for the year 2012. The largest number of units in downstate is found in properties that have between 50 and 100 units. However, the distribution of total units is fairly uniform across all the unit size classes. This means that there are a lot of small buildings (20 or less) with approximately 1/6 of all units; and few super large buildings (>500 units) that also accounts for 1/6 of all units.

**Table 2-9. Multifamily Units by Unit-Size Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

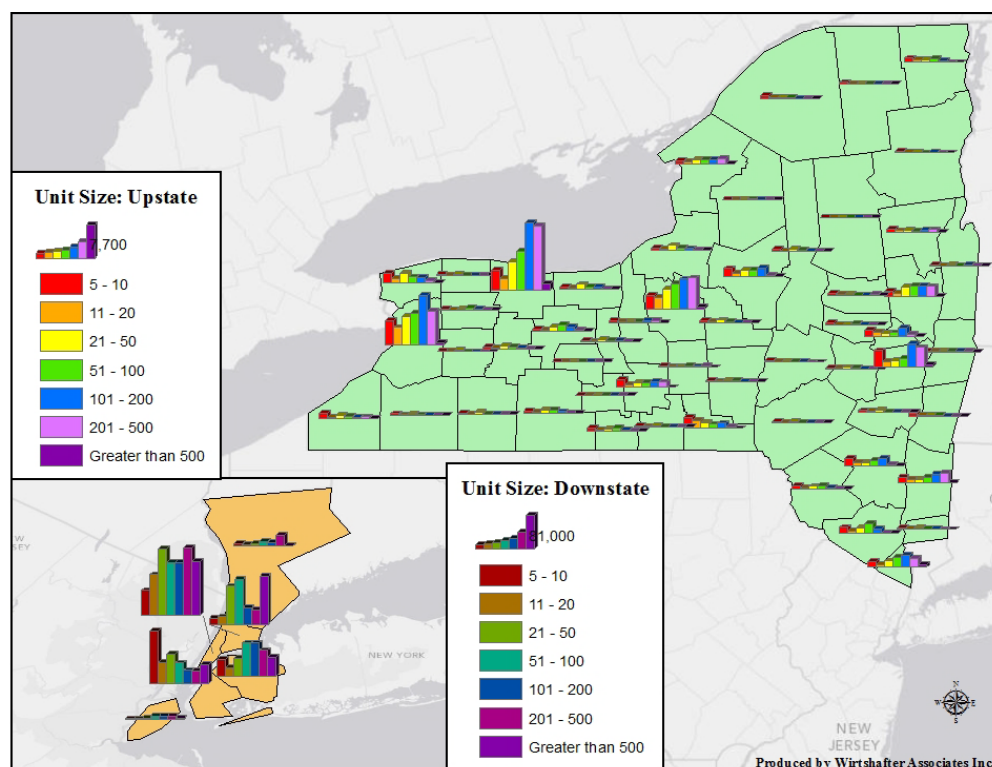
Area	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Downstate	245,699	191,700	372,907	381,850	293,228	322,527	336,362	2,144,273
Upstate	49,756	25,771	47,379	50,470	63,437	47,254	3,775	287,842
Long Island	454	544	1,038	2,623	2,092	671	0	7,422
<b>Total NYS</b>	<b>295,909</b>	<b>218,015</b>	<b>421,324</b>	<b>434,943</b>	<b>358,757</b>	<b>370,452</b>	<b>340,137</b>	<b>2,439,537</b>

Figure 2-11 shows the distribution of multifamily units by the unit-size class for the year 2012.



**Figure 2-11. Number of Multifamily Units by Unit-Size Class (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



In Appendix D, Table D-9 conveys the total number of units in each county by unit-size categories for the year 2012.

### 2.2.12 Number of Units by Age-of-Building Class

Table 2-10 compares the number of units by age-of-building class for the downstate, upstate, and Long Island areas of New York State. The age categories shown in the table include units built before 1900, from 1900 to 1949, from 1950 to 1974, from 1975 to 1999, and from 2000 to 2012.

**Table 2-10. Multifamily Units by Age-of-Building Class**

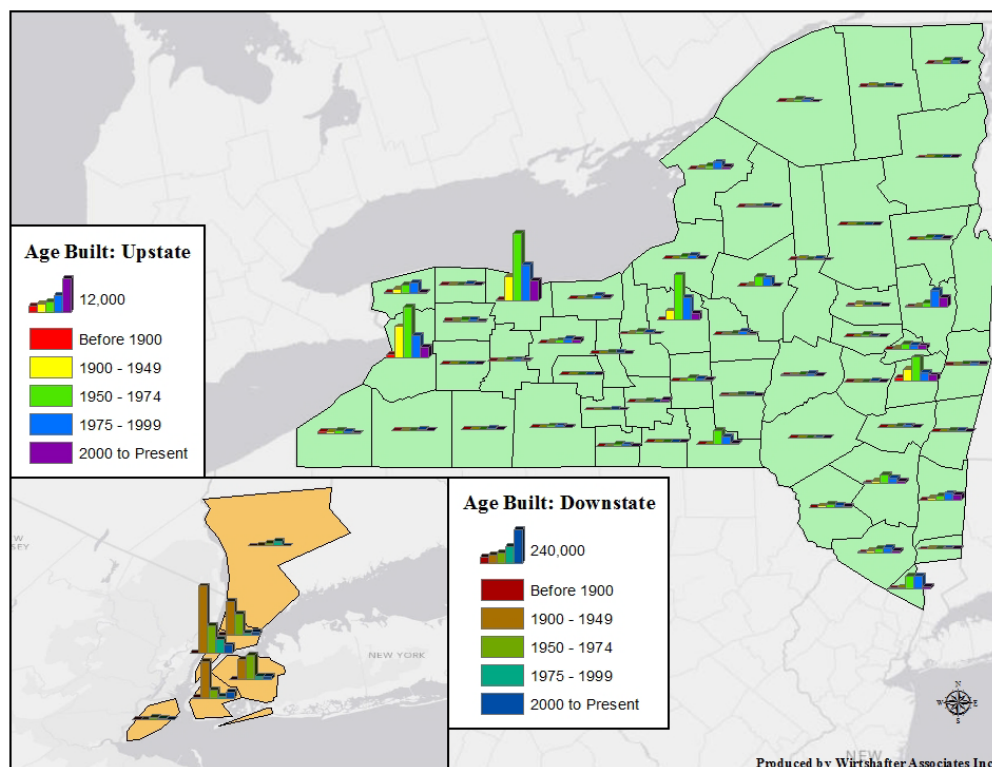
Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

Area	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2012	Total
Downstate	354	15,418	1,148,772	623,120	203,346	153,263	2,144,273
Upstate	12,557	6,080	39,964	113,499	83,319	32,423	287,842
Long Island	134	0	663	5,209	1,172	244	7,422
<b>Total NYS</b>	<b>13,045</b>	<b>21,498</b>	<b>1,189,399</b>	<b>741,828</b>	<b>287,837</b>	<b>185,930</b>	<b>2,439,537</b>

Figure 2-12 shows the distribution of units by the age-of-building class.

**Figure 2-12. Multifamily Units by Age-of-Building Class**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)



In Appendix D, Table D-10 shows the number of units by age-of-building class for each New York State county.

## 2.3 Multifamily New Construction and Renovation Data

Two sources of information are available on new construction and renovations. The U.S. Census (Census) produces an annual survey of building permits for privately-owned housing, and the McGraw-Hill Dodge Players Reports collect information on new construction and renovations. Each of these sources has strengths and weaknesses, which will be discussed at the end of this section. Below, the PE/MCA team presents Census data, followed by the Dodge Players Reports.

### 2.3.1 Multifamily Data from the U.S. Census Permit Survey

The U.S. Census produces an annual summary of building permits for privately-owned housing.<sup>37</sup> Each jurisdiction and county collects information about the number of permits by building, by number of units, and total construction costs, and voluntarily provides the information to the U.S. Census. The New York State permit pattern is similar to that of the country as a whole: it dropped precipitously in 2009 and has been recovering slowly ever since (Figure 2-13). Activity in Pennsylvania is included as a comparison state in the Market Actor survey (as described in Chapter 6). Activity in Pennsylvania dropped a bit in the late 2000s and slowly recovered in 2011 through 2013 (Figure 2-13).

**Figure 2-13. Historic Comparison of Multifamily Permits**

Source: U.S. Census Residential Permits 2004 to 2013

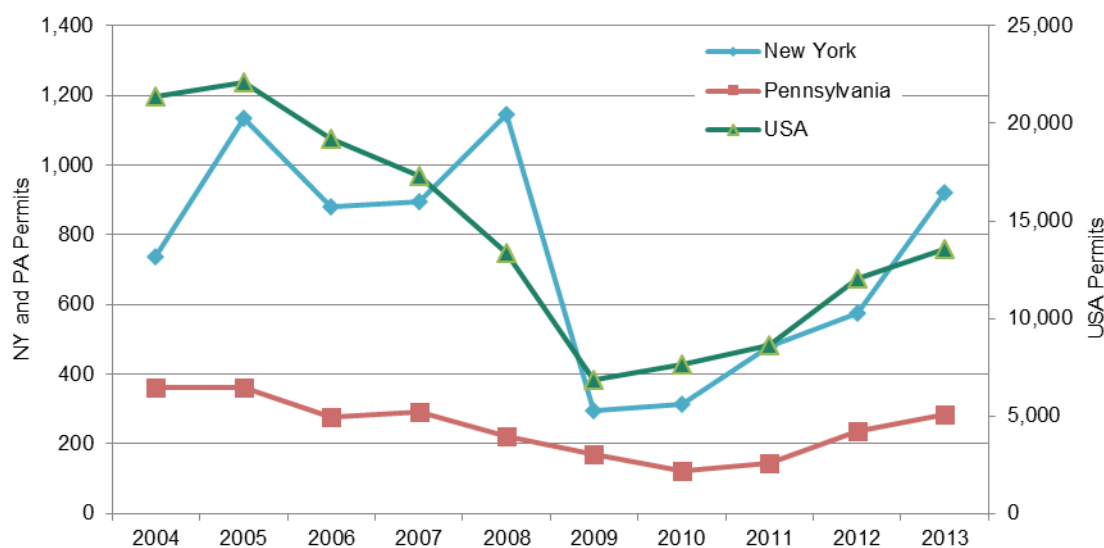


Table 2-11 shows summary statistics of all new building permits with five or more units.

<sup>37</sup> See <http://www.census.gov/construction/bps/> for further information.

**Table 2-11. Privately-Owned Multifamily Building Permit Summary Statistics (2004-2012)**

Source: U.S. Census Building Permits Survey (2004-2012)

Metric	Total
Total Buildings	6,454
Total Units	174,658
<b>Total Construction Cost</b>	<b>\$15,101,905,635</b>

Figure 2-14 shows the number of privately-owned multifamily building permits issued from 1980 to the present. The largest numbers of new multifamily buildings were permitted in 2005 and 2008.

**Figure 2-14. New York State Multifamily Buildings Permitted 1980-2012**

Source: U.S. Census Building Permits Survey (1980-2012); U.S. Census started recording building information in 1980.

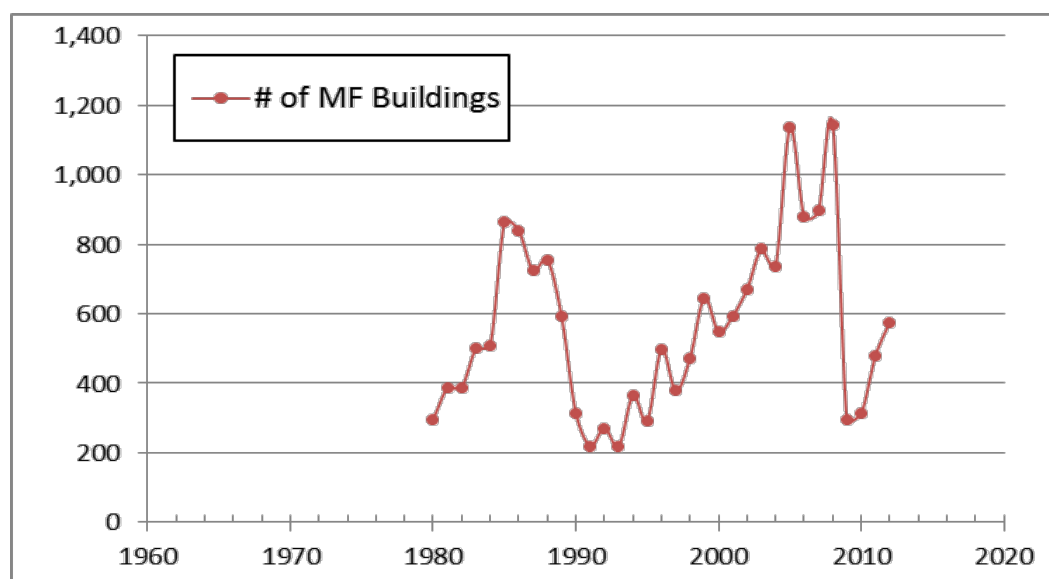
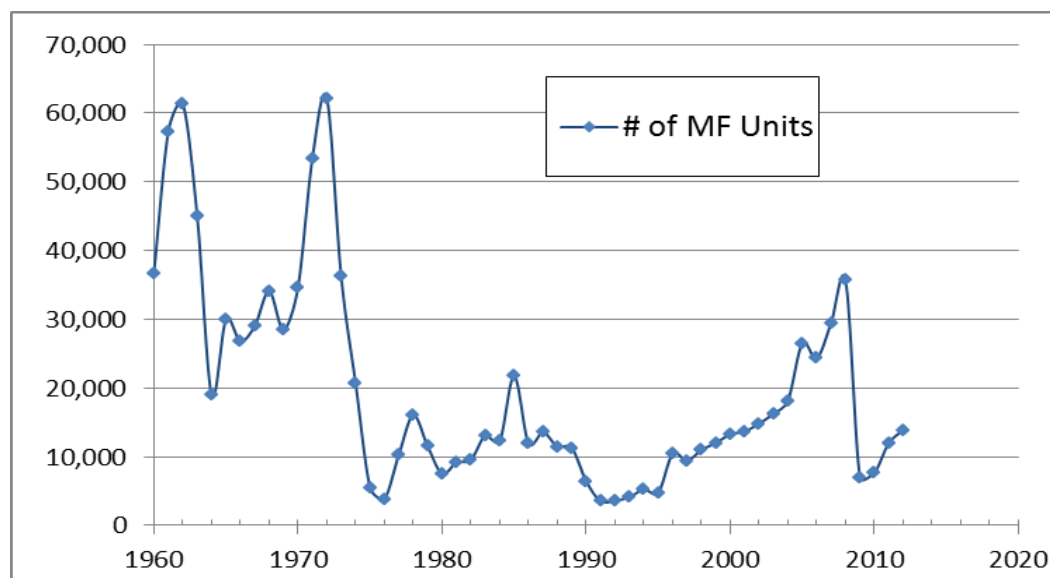


Figure 2-15 displays similar information for multifamily number of units. Tabular data for Figure 2-15 are presented in Appendix E, Table E-1. Census records for this value began in 1960. While the 2008 period was the highest for permits since 1980, far fewer multifamily units have been built since 1980 than were built in the early 1960s, when more than 60,000 units were completed in a couple of years. Permitting activity slowed between 1975 and 2005, and built again between 2005 and 2008 (which peaked at 1,144 new permits). Permitting activity plunged in 2009 and 2010; permitting dropped to 294 buildings in 2009. Recent activity shows the multifamily market is rebounding slightly, though the number of permits issued in 2013 still was only 80% of the 2008 level.

**Figure 2-15. New York State Multifamily Units Permitted 1960-2012**

Source: U.S. Census Building Permits Survey (1960-2012)



In Appendix D, Table D-11 displays the number of new multifamily buildings permitted from 2004 to 2012 across the 62 counties of New York State. According to the results, Brooklyn has had more new multifamily buildings developed than any other county in New York State.

In Appendix D, Table D-12 displays the number of new multifamily units across the 62 New York State counties from 2004 to 2012. Brooklyn and Manhattan counties had the most new multifamily units permitted during that period.

In Appendix D, Table D-13 displays the construction cost (in millions of dollars) for new multifamily properties across the 62 counties from 2004 to 2012.

### 2.3.2 Dodge Data for New York Multifamily Properties

NYSERDA acquired two different lists of data from McGraw Hill. The first is a summary report of housing starts from 2005 through the first quarter of 2013 (the Dodge Housing Starts data).<sup>38</sup> This list is useful because it provides a complete summary of multifamily activity as reported by Dodge. In addition, NYSERDA has collected Dodge Players annual reports dating back to 2004 for all commercial and industrial (C&I) activity in New York State. The McGraw Hill Dodge Players Reports provide a data list of known C&I projects, including new construction and renovation. The list is not comprehensive; it does not

<sup>38</sup> Summary data file prepared by McGraw Hill for 2005 through 2012

include all projects, but the publishers seek to include all large projects and as many smaller projects as they can identify.

The data are not a complete set of records since the periods from July through December 2005 and January through August 2010 are not included. This set of records provides information on each project, though it is noted that the recording of the number of units often is missing. Most projects do not report on the units-level; therefore, users should not rely on reported unit numbers in the Dodge Players data.

Table 2-12 displays Dodge Housing Starts multifamily summary statistics for the years 2005 through the first quarter of 2013. More multifamily projects were reported in 2005 and 2006 than in any other years.

**Table 2-12. Multifamily All Construction and New Construction, Summary Statistics by Year (2005-2013)**

Sources: McGraw Hill Dodge Housing Starts (2005-2012)

Year	All Construction				New Construction Only			
	Projects	Buildings	Value (\$1000)	Area (1000 sq. ft.)	Projects	Buildings	Value (\$1000)	Area (1000 sq. ft.)
2005	3,612	2,393	5,326,079	42,420	2,393	2,393	4,540,641	41,170
2006	3,569	2,302	6,340,825	42,911	2,302	2,302	5,573,224	41,781
2007	2,931	1,646	6,526,081	39,165	1,646	1,646	5,805,432	38,305
2008	2,701	1,549	6,261,837	38,866	1,549	1,549	5,474,314	37,894
2009	1,880	597	2,823,879	13,533	597	597	2,061,692	13,188
2010	1,715	549	2,978,138	13,079	549	549	1,995,200	12,429
2011	2,221	670	3,890,901	17,166	670	670	2,930,528	16,827
2012	2,249	529	5,819,200	19,084	529	529	4,528,115	17,919
2013 Q1	845	322	3,447,913	14,506	322	322	3,030,005	14,014

Table 2-13 shows summary statistics for the upstate, downstate, and Long Island areas of New York State. Almost all of the activity in New York occurred in the downstate region; 94% of all projects (new construction and renovation) and 91% of new construction projects were in the downstate region.

**Table 2-13. Dodge Players Report New Construction Multifamily Summary Statistics (2004-2012)**

Sources: McGraw Hill Dodge Players Reports 2004-2012, 2005 and 2010 data incomplete

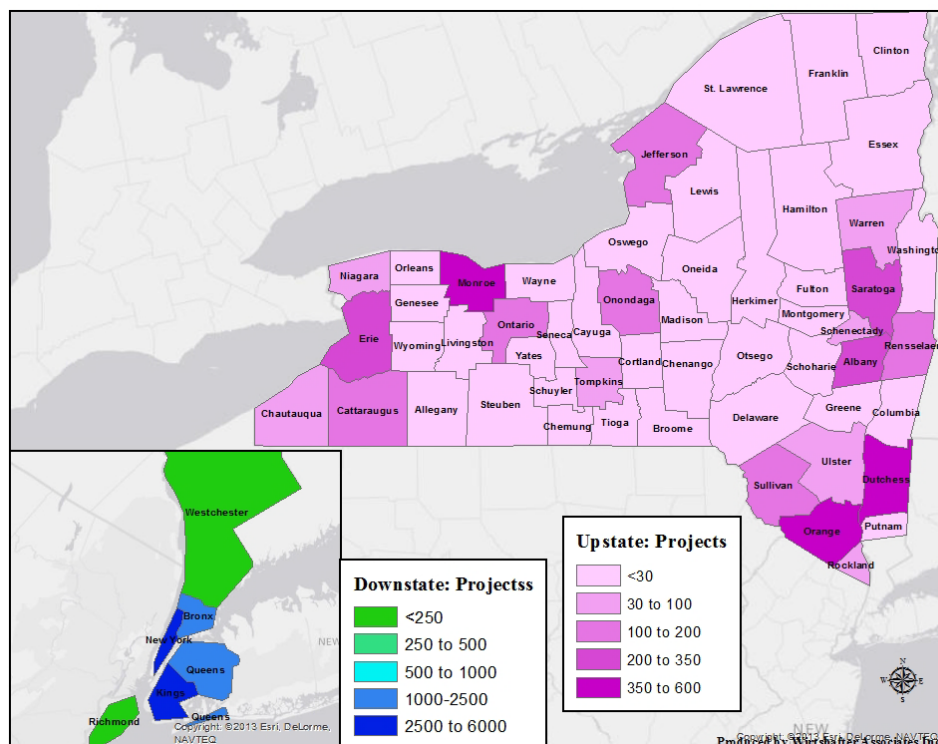
Area	Projects	Buildings	Units	Value (\$1000)	Area (1000 sq. ft.)
<b>All Projects</b>					
Upstate	749	3,689	11,148	3,289,781	27,793
Downstate	14,138	15,063	47,626	30,507,406	204,399
Long Island	80	460	2,539	791,651	6,092
<b>Totals All Projects</b>	<b>14,967</b>	<b>19,212</b>	<b>61,313</b>	<b>34,588,838</b>	<b>238,284</b>
<b>New Construction</b>					
Upstate	389	3,409	8,183	2,448,299	26,245
Downstate	4,505	7,442	24,582	23,710,113	174,377
Long Island	54	421	2,226	665,947	6,092
<b>Total New Construction</b>	<b>4,948</b>	<b>11,272</b>	<b>34,991</b>	<b>26,824,359</b>	<b>206,714</b>
<b>Renovation</b>					
Upstate	360	280	2,965	841,482	1,548
Downstate	9,633	7,621	23,044	6,797,293	30,022
Long Island	26	39	313	125,704	0
<b>Totals Renovation</b>	<b>10,019</b>	<b>7,940</b>	<b>26,322</b>	<b>7,764,479</b>	<b>31,570</b>

In Appendix D, Table D-14 displays various building statistics throughout the 62 counties of New York State between 2004 and 2012. Manhattan had more multifamily projects than any other county in New York State. When looking at the building totals, it appears that Brooklyn built more multifamily buildings than any other county in New York State.

Figure 2-16 shows the distribution of new construction and renovation projects reported by the Dodge Players between 2004 and 2012. According to the figure, upstate counties with the greatest number of new construction and renovation multifamily projects were Erie, Monroe, Onondaga, and Albany. In downstate New York, the counties of Manhattan and Brooklyn had the highest numbers of multifamily projects.

**Figure 2-16. Multifamily New Construction and Renovation Building Projects (2004-2012)**

Sources: McGraw Hill Dodge Players Reports 2004-2012



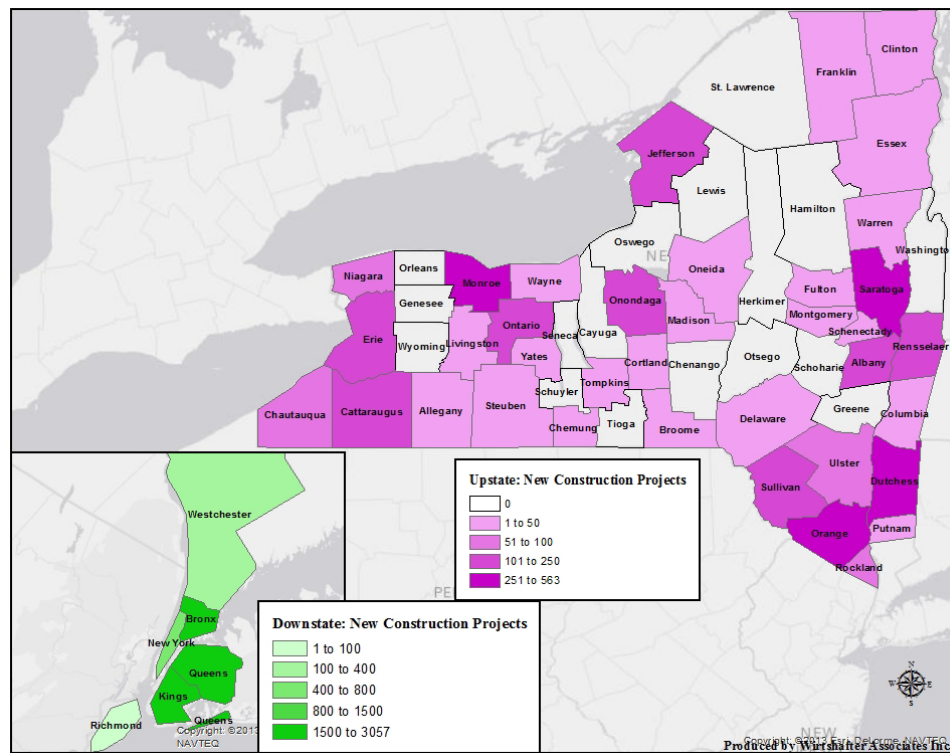
In Appendix D, Table D-16 shows the number of multifamily new construction projects in Dodge Players.

Figure 2-17 shows the number of multifamily buildings newly constructed between 2004 and 2012, by county, as reported by the Dodge Players Reports. The upstate counties with the greatest number of new multifamily buildings were Erie, Monroe, Saratoga, Orange, and Dutchess. In downstate New York, Manhattan and Brooklyn had the greatest number of new multifamily buildings.



**Figure 2-17. Multifamily Newly Constructed Buildings by County (2004-2012)**

Source: McGraw Hill Dodge Players Reports 2004-2012



In Appendix D, Table D-16 shows multifamily building totals for new construction and renovation by stories class size from 2004 through 2012. According to the table, it appears that Brooklyn has the largest total number of multifamily building projects. Brooklyn has the greatest number of total buildings with one to three stories, and has the greatest number of multifamily buildings with four to five-stories. The results also show that Manhattan had the greatest total number of buildings in the following categories: 6 to 10 stories, 11 to 20 stories, and larger than 20 stories.

Table 2-14 displays the number of market actors listed by category for the new construction and renovation projects from 2004 to 2012. This data was used to select the samples for the market actors surveys, described in Chapter 6.

**Table 2-14. Number of Market Actors Listed by Category – New Construction and Renovation (2004-2012)**

Source: McGraw Hill Dodge Players Reports 2004-2012

Actors	New Construction	Renovation	Total
Architect	6,290	3,449	13,855
Civil Engineer	140	6	423
Construction Manager	144	125	793
Consultant	2	0	40
Electrical Engineer	1,404	319	1,845
General Contractor	7,042	3,603	16,837
Interior Designer	6	6	22
Landscape Architect	33	13	116
Mechanical Engineer	2,537	973	4,693
Engineer (no specialty)	184	86	860
Owner	6,435	6,444	24,498
Owner/Agent	34	33	243
Structural Engineer	2,997	608	4,432
<b>Total</b>	<b>27,248</b>	<b>15,665</b>	<b>68,657</b>

### 2.3.3 Comparison of Census, Dodge Housing Starts, and Dodge Players Data

Table 2-15 and Figure 2-18 provide a summary comparison of the Census and Dodge Reports datasets for new construction for the years 2005 to 2012. A summary of the three is provided in the bullets.

- **Census** collects building permit data for all privately-owned residential new construction housing projects. Local jurisdictions provide the data voluntarily; it appears that most, if not all, of New York State jurisdictions have supplied some level of information. It overstates because it includes projects that get permitted but not built, and understates because it does not include public construction. The Census data are for new construction only and do not include renovation projects.
- **Dodge Housing Starts** is a compilation summary prepared by McGraw Hill at the end of the study period. This represents the most accurate accounting of all multifamily activity over the historic picture, but lacks the detail on individual projects that are included in the Players data.
- **Dodge Players** uses proprietary collection process to compile specific lists of projects hoping to identify projects as soon as they become known (in many cases pre-permit stage). The Players dataset provides a current assessment of activity and attempts to record the properties under development at their conception. Dodge Players does not seek to gather information about every project; rather, they capture information about the largest projects, so it is likely

that the database does not include some smaller multifamily projects. The data sets were assembled from periodic data requests for more information on current activity. The combined dataset used is missing July through December 2005 and January through August 2010. Dodge Players also includes some projects that do not get built.

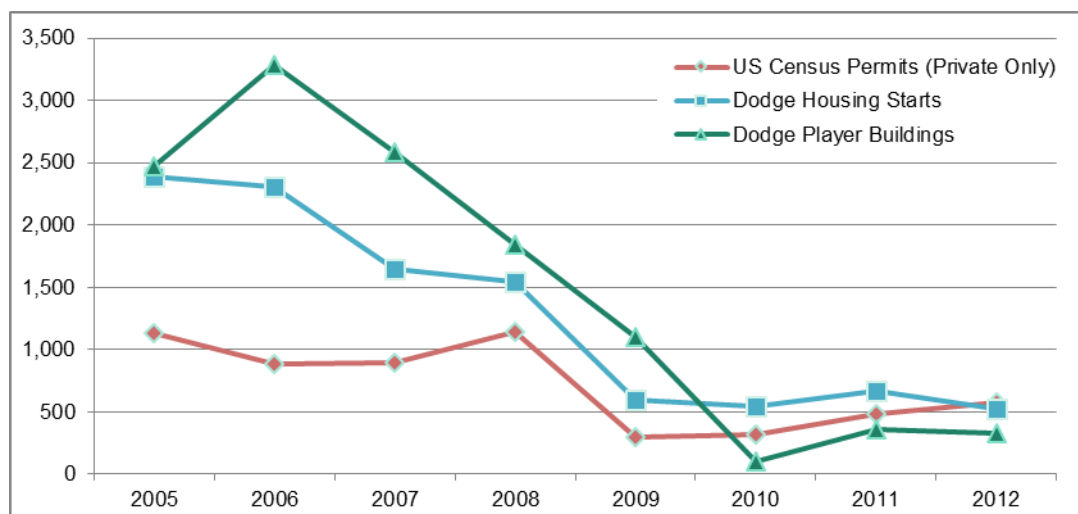
**Table 2-15. Comparison of Census and Dodge Multifamily Totals (2005-2012)**

Sources: U.S. Census Building Permits Survey 2005-2012, Dodge Housing Starts 2005-2013, and McGraw Hill Dodge Players Reports 2005-2012

Year	U.S. Census Permits (Private Only)	Dodge Housing Starts	Dodge Player Buildings
2005	1,135	2,393	2,470
2006	880	2,302	3,289
2007	896	1,646	2,580
2008	1,144	1,549	1,845
2009	294	597	1,104
2010	313	549	97
2011	479	670	364
2012	576	529	330
<b>Total</b>	<b>5,717</b>	<b>10,235</b>	<b>12,079</b>

**Figure 2-18. Comparison of Census Permits and Dodge New Construct Annual Totals**

Sources: U.S. Census Building Permits Survey 2005-2012, Dodge Housing Starts 2005-2013, and McGraw Hill Dodge Players Reports 2004-2012



An attempt was made to reconcile the three data sets. There are issues with the coverage of the three data sets, as explained above. There is also the issue of timing. Dodge may list a project in one year and Census may list that project in a different year. Finally, Census includes only private projects, while Dodge

includes public and private. The large discrepancy between the Census data and the two Dodge data sets, especially in the 2005- 2008 period could be attributed to a combination of the aforementioned factors.

## 2.4 New York City Benchmarking Data

In 2009, New York City passed a law requiring that all privately-owned properties with individual buildings over 50,000 square feet or with multiple buildings with a combined square footage over 100,000 square feet annually measure and report their energy and water use. The data have been assembled and the first report was published by the New York City Mayor's Office in 2012.<sup>39</sup>

The report includes energy use data for more than 6,000 multifamily properties in NYC, representing 80% of the properties and 65% of the total area for which benchmarking data were reported. Because multifamily properties are less energy-intensive, they only account for about 50% of the total reported energy use.

The report points out that there is a wide variation in the energy use intensity (EUI) within the multifamily sector. The EUI is the amount of energy used divided by the gross area of the building. Two types of EUIs are calculated: Site EUI and Source EUI. Site EUI uses the energy consumed by the building. Source EUI captures energy used at the site, and includes the additional energy needed to generate and deliver that energy to the site. The most energy-intensive multifamily properties use more than four times the energy per square foot than the least energy-intensive multifamily buildings. The median Source EUI for multifamily properties is 132.2. An attempt was made to get a copy of the benchmarking data, but it was not released to the PE/MCA team.

## 2.5 Multifamily Vacancy Rates

Multifamily vacancy rates can affect owners' and managers' willingness to participate in energy efficiency programs and to make investments in their properties. When vacancy rates are low, some owners may decide not to spend money on improvements because these investments will not significantly impact their ability to rent units. In contrast, other owners consider such periods of low vacancy good times to invest in their properties, since rents are high and secure, providing opportunities to reinvest some of their profits in their properties.

Table 2-16 shows the historic vacancy rates for all rental properties in New York State, Pennsylvania, and the U.S. from 1986 through 2013. While vacancy rates in New York State have traditionally been well below the national average, these rates are currently falling; the 2012 rate is the second-lowest since the 1980s. Figure 2-19 shows the historic vacancy rates in graphic form.

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<sup>39</sup> *New York City Local Law 84 Benchmarking Report*, 2012. Published by PLANYC, Mayor's Office of Long-Term, Planning & Sustainability, New York, NY.

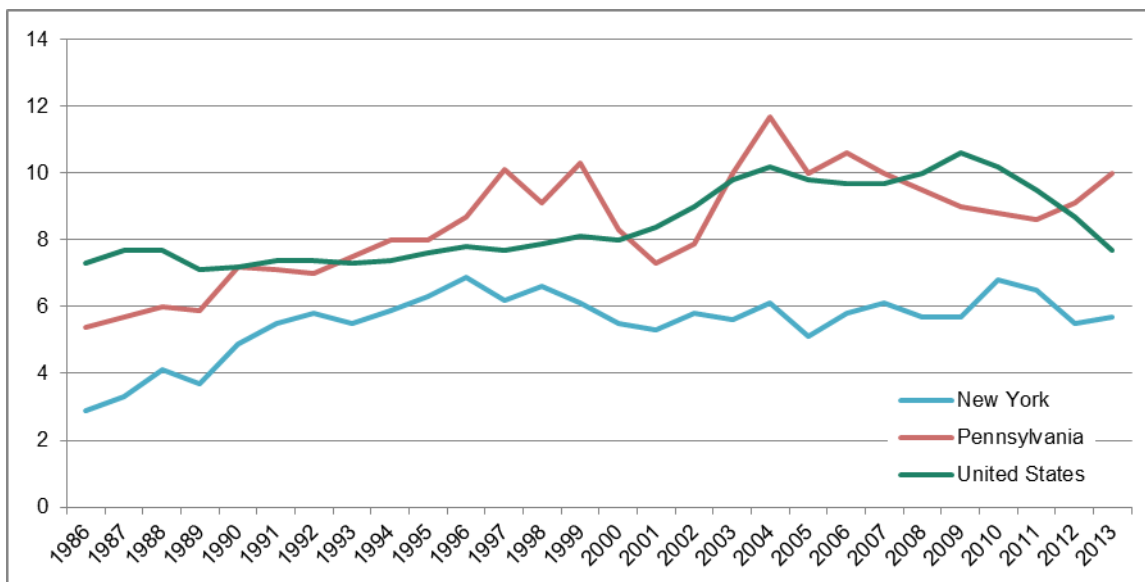
**Table 2-16. Historic Vacancy Rates (1986-Q1 2013)**

Source: Current Population Survey/Housing Vacancies and Homeownership, Series H-111, 2014

Area	1986	1987	1988	1989	1990	1991	1992	1993	1994
New York	2.9	3.3	4.1	3.7	4.9	5.5	5.8	5.5	5.9
Pennsylvania	5.4	5.7	6	5.9	7.2	7.1	7	7.5	8
U.S.	7.3	7.7	7.7	7.1	7.2	7.4	7.4	7.3	7.4
Area	1995	1996	1997	1998	1999	2000	2001	2002	2003
New York	6.3	6.9	6.2	6.6	6.1	5.5	5.3	5.8	5.6
Pennsylvania	8	8.7	10.1	9.1	10.3	8.3	7.3	7.9	10
U.S.	7.6	7.8	7.7	7.9	8.1	8	8.4	9	9.8
Area	2004	2005	2006	2007	2008	2009	2010	2011	2012
New York	6.1	5.1	5.8	6.1	5.7	5.7	6.8	6.5	5.5
Pennsylvania	11.7	10	10.6	10	9.5	9	8.8	8.6	9.1
U.S.	10.2	9.8	9.7	9.7	10	10.6	10.2	9.5	8.7
Area	2013								
New York	5.7								
Pennsylvania	10.0								
U.S.	7.7								

**Figure 2-19. Historic Vacancy Rates (1986-2013)**

Source: Current Population Survey/Housing Vacancies and Homeownership, Series H-111, 2014



## 2.6 MPP Participation Data

The PE/MCA team pulled data for all projects in the Comprehensive Residential Information System (CRIS) database on March 5, 2013. The following analysis covers the period from the beginning of MPP (January 2007) through the data retrieval on March 5, 2013. Table 2-17 shows, by program, the total number of properties, buildings, and units participating in MPP. A more detailed assessment of MPP version 4 and 5 activities is found in Chapter 3 below.

**Table 2-17. MPP Summary Statistics by Program Name**

Source: CRIS Database 3/5/2013

Program Name	Number of Properties	Number of Buildings	Number of Units
MPP Existing Buildings	728	3,531	145,112
MPP New Construction	319	336	21,450
<b>Total MPP</b>	<b>1,047</b>	<b>3,867</b>	<b>166,562</b>
Number in NYSERDA area	132,491	169,911	2,526,919 <sup>a</sup>
<b>Percent Covered by MPP</b>	<b>0.8%</b>	<b>2.3%</b>	<b>6.6%</b>

<sup>a</sup> Because of the missing unit values in the tax data set, the value comes from American Community Survey 2008-2012 report.

Table 2-18 compares the total number of properties, buildings, and units in MPP according to the application year.

**Table 2-18. MPP Summary Statistics by Application Year**

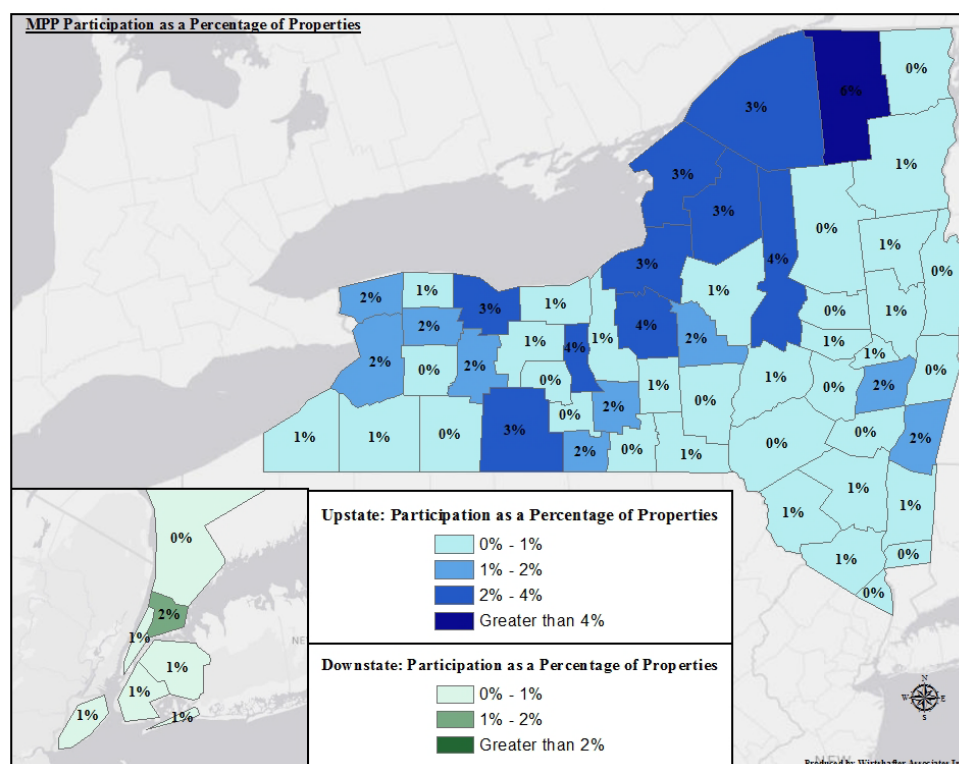
Source: CRIS Database 3/5/2013

Application Year	Number of Properties	Number of Buildings	Number of Units
2005	5	5	499
2006	4	6	312
2007	195	877	48,801
2008	361	1,450	52,781
2009	167	767	15,053
2010	23	37	3,991
2011	102	214	14,130
2012	172	425	28,071
2013	18	86	2,924
<b>Total</b>	<b>1,047</b>	<b>3,867</b>	<b>166,562</b>

Figure 2-20 shows the distribution of MPP activity across counties as a percentage of multifamily properties for the year 2012. Overall MPP has reached 0.8% of all multifamily properties. It should be noted that in most counties, MPP has reached less than 3% of the available properties.

**Figure 2-20. MPP Participation as a Percentage of Multifamily Properties (2012)**

Sources: CRIS Database 3/5/2013, PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department 204-2012



In Appendix D, Table D-17 shows the number of properties that participated in MPP and the MPP participation rate as a percentage of properties by county for the year 2012.

In Appendix D, Table D-18 shows the number of multifamily buildings that have participated in MPP by county and the MPP participation rate as a percentage of each county's multifamily buildings for the year 2012.

Table 2-19 displays various building statistics by utility company for the year 2012. There are seven utility companies presented in this table: Central Hudson Gas and Electric, Consolidated Energy, Long Island Power Authority, National Grid, New York State (NYS) Electric and Gas, Orange and Rockland Utilities, and Rochester Gas and Electric. The table also provides counts of missing data.

**Table 2-19. MPP Activity Statistics by Utility Service Territory**

Sources: CRIS Database 3/5/2013

Company Name	Number of Properties	Total Number of Buildings	Total Number of Units
Missing	930	1,278	37,351
Central Hudson Gas and Electric	4,827	1,855	17,722
Consolidated Edison	89,137	99,986	2,194,903
Long Island Power Authority	9,014	1,357	32,320
Municipal	941	925	7,790
National Grid	12,420	12,131	162,785
New York State Electric and Gas	5,844	4,628	62,316
Orange and Rockland Utilities	7,666	953	15,391
Rochester Gas and Electric	1,999	2,883	60,495
<b>Total</b>	<b>132,778</b>	<b>125,996</b>	<b>2,591,073</b>

Table 2-20 displays the total number of participants in MPP by New York State utility for the year 2012. Totals shown in the table consist of the number of participating properties, buildings, and units for each New York State utility.

**Table 2-20. MPP Participants by Utility Service Territory (2012)**

Sources: CRIS Database 3/5/2013

Company	Number of Properties	Number of Buildings	Number of Units
Missing	1	6	723
Central Hudson Gas and Electric	27	104	2,092
Consolidated Edison	665	1,460	130,949
Long Island Power Authority	5	47	1,711
National Grid	225	1,406	20,706
New York State Electric and Gas	67	464	5,720
Orange and Rockland Utilities	13	51	1,132
Rochester Gas and Electric	44	329	3,529
<b>Total</b>	<b>1,047</b>	<b>3,867</b>	<b>166,562</b>

Figure 2-21 shows the distribution of MPP projects as a percentage of total properties in each utility for the year 2012.



**Figure 2-21. Distribution of MPP Projects by Utility Service Territory (2012)**

Source: CRIS Database 3/5/2013

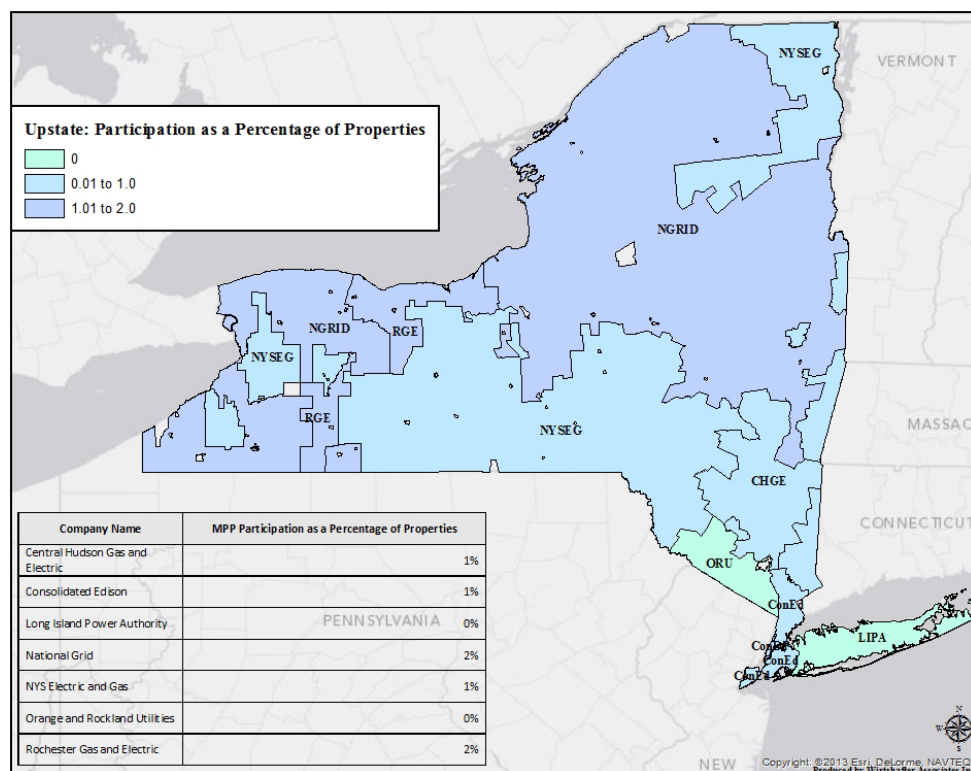


Table 2-21 shows MPP participation rate as a percentage of total properties, total buildings, or total units by utility for the year 2012. MPP Participation is calculated as the number of MPP participating properties, buildings, and unit, divided by the total number of properties, buildings, or units for each of the seven New York State utility companies. According to Table 2-21, National Grid and Rochester Gas and Electric had the highest participation in terms of properties, at 2%. National Grid received the highest level of participation in terms of the percentage of buildings, achieving a participation rate of 12%.

**Table 2-21. MPP Participation as a Percentage of Buildings and Units by Utility Service Territory (2012)**

Sources: CRIS Database 3/5/2013

Company Name	MPP Participation as a Percentage of Properties	MPP Participation as a Percentage of Buildings	MPP Participation as a Percentage of Units
Central Hudson Gas and Electric	1%	6%	10%
Consolidated Edison	1%	1%	5%
Long Island Power Authority	0%	3%	4%
National Grid	2%	12%	7%
New York State Electric and Gas	1%	10%	7%
Orange and Rockland Utilities	0%	5%	6%
Rochester Gas and Electric	2%	11%	5%

Table 2-22 shows a count of MPP participants across New York State according to unit size for the year 2012. The three unit classes shown in Table 2-22 consist of properties with 1-20 units, 21-75 units, and more than 75 units. According to the table, more than 50% of the participants in MPP had properties that exceeded 75 units. There are 527 participants who had properties that exceeded 75 units. Three-hundred-forty participants in MPP had properties between 21 units and 75 units. Finally, 180 participants in MPP had properties that fell into the 1-20 unit range.

**Table 2-22. MPP Projects by Unit Class (2012)**

Sources: CRIS Database 3/5/2013

Units	Count	Percent
1-20	180	17%
21-75	340	33%
More than 75	527	50%
<b>Total</b>	<b>1,047</b>	<b>100%</b>

## 3 Market Assessment for Program Versions 4 and 5

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This section describes the characteristics of MPP-supported projects incented under MPP versions 4 and 5. MPP may use findings from this section to understand which opportunities it has relied on for savings and to develop new strategies for opportunities MPP has targeted less frequently. The assessment summarizes: project volumes, savings estimates, and project costs by market type (affordable versus market rate) and construction type (existing buildings versus new construction); and, within each of these, by region (downstate versus upstate). Data for this analysis were drawn from NYSERDA's CRIS database of projects as of January 24, 2014. The database classifies projects by the address(s) associated with the building(s) in a project. In many instances, a single project may cover all of the upgrade activities for a group of buildings at a common location and under the same ownership, or a project may encompass the upgrade activities or improvements made to a single existing or new building. The database also captures information on the buildings targeted for improvement under the program. In this section, we refer to *project site* separately from *project* in order to describe the characteristics and number of buildings included in each project.

### 3.1 Market Type

MPP offers two tiers of incentive levels based on the financial status of the building tenants: affordable-rate incentives are offered for projects where at least 25% of building tenants meet income thresholds and market-rate incentives are offered for projects that do not meet this criterion.<sup>40</sup> The following analysis summarizes completed projects by region and market type, and describes project site characteristics, project costs, and project savings estimates.

#### 3.1.1 Project Site Characteristics

Table 3-1 summarizes the 221 completed projects by site characteristics by region. Most projects (77%, or 171 projects) were located in downstate, and a majority of these downstate projects (87%, or 149 projects) were affordable-rate projects.

Project site characteristics differed significantly between regions and market types. Upstate project sites tended to have more buildings and smaller buildings than the downstate project sites. Across the state, 670 buildings were located at the 221 project sites, with an average of 3.0 buildings involved in upgrades per project site. Upstate project sites had an average of 5.0 buildings per project site, which is more than twice the 2.4 average buildings per downstate project site. Downstate project sites contained higher-occupancy

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<sup>40</sup> Affordable-rate incentives are offered for projects in which NYSERDA has established proxies for low income housing, or in which at least 25% of building tenants have a calculated household income no more than 80% of the State Median Income (see NYSERDA. 2010. "Existing Buildings: Program Guidelines Version 5." Pages 5-6. and NYSERDA. 2010. "New Construction: Program Guidelines Version 5" Pages 9-11.).

buildings, with an average of 191 units (with a range of 5 to 1,712 units) compared to an average of 86 units (with a range of 5 to 599 units) for upstate project sites. The average downstate project site's total square footage was approximately 200,000 square feet, which is nearly three times as large as the average upstate project site's total square footage of approximately 73,000 square feet.

Additionally, market rate project sites within each region contained a greater number of buildings on average and had greater average total square footage than the affordable rate sites. Market rate project sites for the two regions averaged more buildings – 2.8 and 8.0 for downstate and upstate respectively – compared to 2.2 and 4.8 for affordable rate project sites. In addition, market rate sites had greater average square footage, which is why these project sites accounted for nearly half of all total square footage for all projects, while accounting for only one-third of all projects.

**Table 3-1. Project Site Characteristics by Region and Market Type**

Sources: CRIS Database 1/23/2014, MPP version 4-5, project stages: completed waiver; payment 2, 3, or 4; exhibit C.

Project Site Characteristic	NYS Total	Downstate Projects			Upstate Projects		
		Affordable	Market Rate	Total	Affordable	Market Rate	Total
Total Projects	<b>221</b>	<b>103</b>	<b>68</b>	<b>171</b>	<b>46</b>	<b>4</b>	<b>50</b>
Total Buildings	<b>670</b>	228	190	<b>418</b>	220	32	<b>252</b>
Avg. Buildings per Project Site	<b>3.0</b>	2.2	2.8	<b>2.4</b>	4.8	8.0	<b>5.0</b>
Avg. Units per Project Site	<b>167</b>	159	240	<b>191</b>	81	143	<b>86</b>
Total sq. ft. for All Project Sites	<b>36,761,753</b>	16,454,822	17,068,381	<b>33,523,203</b>	2,793,190	445,360	<b>3,238,550</b>
Avg. sq. ft. per Project Site	<b>176,739</b>	166,210	262,590	<b>204,410</b>	68,127	148,453	<b>73,603</b>
Total sq. ft. for All Project Sites	<b>32,942,809</b>	15,246,520	14,546,808	<b>29,793,328</b>	2,745,758	403,723	<b>3,149,481</b>
Avg. sq. ft. per Project Site	<b>159,144</b>	154,005	227,294	<b>182,781</b>	66,970	134,574	<b>71,579</b>

### 3.1.2 Project Economics and Funding Sources

Table 3-2 summarizes completed projects' in terms of funding sources, project costs, simple payback periods, and program savings-to-investment-ratio<sup>41</sup> (SIR) by region and market type. Forty-three of the 221 total projects (19%) included funding from the Regional Greenhouse Gas Initiative (RGGI),<sup>42</sup> and most of

<sup>41</sup> The SIR calculation is an estimate of savings per dollar spent. A SIR of 1 is a break-even point where project owners receive returns equal to their investment.

<sup>42</sup> RGGI is a cooperative effort among the states of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont to cap and reduce power sector CO<sub>2</sub> emissions.

*Continued...*

these projects were market-rate projects located in downstate; two projects included funding from Green Jobs Green New York (GJGNY).<sup>43</sup> Affordable-rate projects accounted for nearly three of every four MPP dollars spent, or \$122 million of the total \$167 million MPP spent on project costs. The average affordable-rate projects cost MPP more to complete than the market-rate projects within the same region. The average downstate project (\$887,000) cost MPP nearly 2.4 times more to complete than the average upstate project (\$372,000). Affordable-rate projects on average had longer simple payback periods: 8.4 years for downstate and 9.3 years for upstate affordable-rate projects; and 7.1 years for market-rate projects in both regions. MPP's average project SIR – an estimate of the program's return on investment (ROI) – was higher for market-rate projects (2.4 for downstate and 2.6 for upstate) than for affordable rate projects (1.8 downstate and 1.6 for upstate).

**Table 3-2. Project Economics and Funding Sources by Region and Market Type**

Sources: CRIS Database 1/23/2014, MPP version 4-5, project stages: completed waiver; payment 2, 3, or 4; exhibit C.

Funding Characteristic	NYS Total	Downstate Projects			Upstate Projects		
		Affordable	Market Rate	Total	Affordable	Market Rate	Total
Total Projects	<b>221</b>	<b>103</b>	<b>68</b>	<b>171</b>	<b>46</b>	<b>4</b>	<b>50</b>
RGGI-Funded Projects	<b>43</b>	8	32	<b>40</b>	3		<b>3</b>
GJGNY-Funded Projects	<b>2</b>		1	<b>1</b>	1		<b>1</b>
Total Project Costs (\$)	<b>166,912,596</b>	105,160,737	43,906,772	<b>149,067,509</b>	17,181,361	663,726	<b>17,845,087</b>
Avg. Project Cost (\$)	<b>772,744</b>	1,020,978	675,489	<b>887,307</b>	381,808	221,242	<b>371,773</b>
Avg. Project Payback (Years)	<b>8.1</b>	8.4	7.1	<b>7.8</b>	9.3	7.1	<b>9.2</b>
Avg. SIR	<b>1.9</b>	1.8	2.4	<b>2.0</b>	1.6	2.6	<b>1.7</b>

RGGI funds are receipts from each state's auctions of CO<sub>2</sub> allowances. For MPP, RGGI funds may provide incentives to repair and replace space and domestic-water heating systems, as well as to install insulation, air sealing, and other building shell energy efficiency measures that reduce oil and propane energy use.

<sup>43</sup> GJGNY is a statewide program administered by NYSERDA to provide New Yorkers with access to energy assessments, installation services, low-cost financing for residential customers, and pathways to training for green jobs. Services are delivered in targeted communities through community-based organizations, which recruit residential, small business, nonprofits, and multifamily building owners into the assessment and financing programs.

### 3.1.3 Project Savings

Table 3-3 summarizes project savings between regions and by market type, and provides some detail about areas within buildings – tenant spaces or common areas – where savings occur. Nearly 85% of the MPP’s 38 million kWh in savings were generated by projects located downstate. Two-thirds of downstate savings were delivered by affordable-rate projects, and nearly all upstate savings came from affordable-rate projects (92%). Similarly, about 90% of MPP’s 719,000 MMBtu in savings from nonelectric sources were delivered by downstate projects.

**Table 3-3. Summary of Project Savings by Market Type and Region**

Sources: CRIS Database 1/23/2014, MPP version 4-5, project stages: completed waiver; payment 2, 3, or 4; exhibit C.

Project Savings Characteristic	NYS Total	Downstate Projects			Upstate Projects		
		Affordable	Market Rate	Total	Affordable	Market Rate	Total
Total Projects	<b>221</b>	<b>103</b>	<b>68</b>	<b>171</b>	<b>46</b>	<b>4</b>	<b>50</b>
<b>Savings from Electric Sources (kWh)</b>							
Total Savings: All Projects	<b>38,356,528</b>	21,985,986	10,894,342	<b>32,880,328</b>	5,381,495	94,705	<b>5,476,200</b>
Total Savings: Tenant Spaces	<b>1,420,083</b>	646,857	615,469	<b>1,262,326</b>	157,757	—	<b>157,757</b>
Total Savings for Common Areas	<b>36,936,445</b>	21,339,129	10,278,873	<b>31,618,002</b>	5,223,738	94,705	<b>5,318,443</b>
Avg. Project Savings	<b>182,650</b>	219,860	170,224	<b>200,490</b>	125,151	31,568	<b>119,048</b>
Avg. Project Savings for Tenant Spaces	<b>6,426</b>	6,280	9,051	<b>7,382</b>	3,430	—	<b>3,155</b>
Avg. Project Savings for Common Areas	<b>167,133</b>	207,176	151,160	<b>184,901</b>	113,560	23,676	<b>106,369</b>
<b>Savings from Non-Electric Sources (MMBtu)</b>							
Total Savings: All Projects	<b>719,322</b>	363,509	294,866	<b>658,375</b>	51,308	9,640	<b>60,948</b>
Total Savings: Tenant Spaces	<b>4,315</b>	5,698	(1,233)	<b>4,465</b>	(150)	—	<b>(150)</b>
Total Savings for Common Areas	<b>715,007</b>	357,811	296,099	<b>653,910</b>	51,458	9,640	<b>61,098</b>
Avg. Project Savings	<b>3,346</b>	3,529	4,607	<b>3,942</b>	1,140	3,213	<b>1,270</b>
Avg. Project Savings for Tenant Spaces	<b>20</b>	55	(18)	<b>26</b>	(3)	—	<b>(3)</b>
Avg. Project Savings for Common Areas	<b>3,235</b>	3,474	4,354	<b>3,824</b>	1,119	2,410	<b>1,222</b>

CRIS includes data on whether a measure was dedicated to a common area or tenant space. Tenant measures consisted of lighting and appliances installed inside tenant spaces. Some cases exist where installed measures are recorded in the project database as producing savings in common areas, even though those measures help to reduce tenant utility costs. For example, envelope measures may help to reduce electricity loads drawn by air-conditioning units in individually-metered building units, yet the envelope measure is recorded in the project database as producing savings in common areas. Four percent of the MPP's electricity savings were generated from measures attributed to tenant spaces, and these savings levels were relatively constant across projects between regions and market types. In addition, nearly all of the gas savings were generated by measures attributed to common spaces.

## 3.2 Construction Type

MPP incents both retrofit projects for existing buildings and energy efficiency measures for new construction. The following analysis summarizes the characteristics of projects by region and construction type, and describes these projects in terms of site characteristics, economics, and project savings.

### 3.2.1 Site Characteristics

Table 3-4 summarizes the 221 completed projects by project site characteristics. The most common project type is an existing building – 145 projects (66% of the total). On average, existing building projects had more buildings and units onsite, and more square footage, than new construction sites from both regions. New construction sites contained fewer buildings – one building per site on average – than existing building sites, which contained an average of 3.2 (downstate) and 6.8 (upstate). Existing building sites were about three times larger than new construction sites; existing building sites accounted for more than four-fifths of the combined total square footage from all projects, or 28 million square feet of the combined 33 million square feet (85%).

**Table 3-4. Summary of Project Site Characteristics by Region and Construction Type**

Sources: CRIS Database 1/23/2014, MPP version 4-5, project stages: completed waiver; payment 2, 3, or 4; exhibit C.

Project Site Characteristic	NYS Total	Downstate Projects			Upstate Projects		
		Existing Buildings	New Construction	Total	Existing Buildings	New Construction	Total
Total Projects	<b>221</b>	<b>110</b>	<b>61</b>	<b>171</b>	<b>35</b>	<b>15</b>	<b>50</b>
Total Buildings	<b>670</b>	355	63	<b>418</b>	237	15	<b>252</b>
Avg. Buildings per Project Site	<b>3.0</b>	3.2	1.0	<b>2.4</b>	6.8	1.0	<b>5.0</b>
Avg. Units per Project Site	<b>167</b>	251	82	<b>191</b>	110	30	<b>86</b>
Total sq. ft. for All Project Sites	<b>36,761,753</b>	28,571,728	4,951,475	<b>33,523,203</b>	2,751,924	486,626	<b>3,238,550</b>
continued							

Project Site Characteristic	NYS Total	Downstate Projects			Upstate Projects		
		Existing Buildings	New Construction	Total	Existing Buildings	New Construction	Total
Avg. sq. ft. per Project Site	<b>176,739</b>	277,395	81,172	<b>204,410</b>	94,894	32,442	<b>73,603</b>
Total sq. ft. for All Project Sites	<b>32,942,809</b>	25,342,290	4,451,038	<b>29,793,328</b>	2,692,851	456,630	<b>3,149,481</b>
Avg. sq. ft. per Project Site	<b>159,144</b>	248,454	72,968	<b>182,781</b>	92,857	30,442	<b>71,579</b>

### 3.2.2 Project Economics and Funding Sources

Table 3-5 summarizes projects in terms of funding sources, project costs, simple payback period, and SIR. Forty-three projects included funding from RGGI. Most of these projects were Existing Building projects located in downstate; two projects included funding from GJGNY. About two-thirds of MPP's total project costs were incurred by existing building projects (about \$110 million of the total of \$167 million). Average project costs within each region were similar between construction types. The average project payback<sup>44</sup> was lower for downstate projects (7.8 years) than for upstate projects (9.2 years). The average payback was lower for existing building projects, which had an average payback of 7.4 years. The highest average payback periods were for upstate existing building projects (9.5 years). The SIR strongly correlates with the average project payback, as projects with a higher SIR generally pay back their investments in fewer years.

**Table 3-5. Project Economics and Funding Sources by Region and Construction Type**

Sources: CRIS Database 1/23/2014, MPP version 4-5, project stages: completed waiver; payment 2, 3, or 4; exhibit C.

Funding Characteristic	NYS Total	Downstate			Upstate		
		Existing Buildings	New Construction	Total	Existing Buildings	New Construction	Total
Total Projects	<b>221</b>	<b>110</b>	<b>61</b>	<b>171</b>	<b>35</b>	<b>15</b>	<b>50</b>
RGGI-Funded Projects	<b>43</b>	40	—	<b>40</b>	—	3	<b>3</b>
GJGNY-Funded Projects	<b>2</b>	1	—	<b>1</b>	1	—	<b>1</b>
Total Project Costs (\$)	<b>166,912,596</b>	97,755,555	51,311,954	<b>149,067,509</b>	11,949,515	5,895,572	<b>17,845,087</b>
Avg. Project Cost (\$)	<b>772,744</b>	905,144	855,199	<b>887,307</b>	362,107	393,038	<b>371,773</b>
Avg. Project Payback (Years)	<b>8.1</b>	7.4	8.7	<b>7.8</b>	9.5	8.5	<b>9.2</b>
Avg. SIR	<b>1.9</b>	2.3	1.6	<b>2.0</b>	1.6	1.9	<b>1.7</b>

<sup>44</sup> Average project payback calculates the average simple payback of all projects without weighting projects by total project costs.



### 3.2.3 Project Savings

Table 3-6 summarizes project savings by construction type and region. Existing buildings projects delivered approximately 80% of MPP's kWh savings and 90% of its MMBtu savings. Average project savings were much greater for existing building projects within each region. Almost all project savings were allocated to common spaces.

**Table 3-6. Summary of Project Savings by Construction Type and Region**

Sources: CRIS Database 1/23/2014, MPP version 4-5, project stages: completed waiver; payment 2, 3, or 4; exhibit C.

Project Savings Characteristic	NYS Total	Downstate			Upstate		
		Existing Buildings	New Construction	Total	Existing Buildings	New Construction	Total
Total Projects	<b>221</b>	<b>110</b>	<b>61</b>	<b>171</b>	<b>35</b>	<b>15</b>	<b>50</b>
<b>Savings from Electric Sources (kWh)</b>							
Total Savings: All Projects	<b>38,356,528</b>	27,289,553	5,590,775	<b>32,880,328</b>	3,976,252	1,499,948	<b>5,476,200</b>
Total Savings: Tenant Spaces	<b>1,420,083</b>	1,262,326	—	<b>1,262,326</b>	157,757	—	<b>157,757</b>
Total Savings for Common Areas	<b>36,936,445</b>	26,027,227	5,590,775	<b>31,618,002</b>	3,818,495	1,499,948	<b>5,318,443</b>
Avg. Project Savings	<b>182,650</b>	262,400	93,180	<b>200,490</b>	128,266	99,997	<b>119,048</b>
continued							
Avg. Project Savings for Tenant Spaces	<b>6,426</b>	11,476	—	<b>7,382</b>	4,507	—	<b>3,155</b>
Avg. Project Savings for Common Areas	<b>167,133</b>	236,611	91,652	<b>184,901</b>	109,100	99,997	<b>106,369</b>
<b>Savings from Non-Electric Sources (MMBtu)</b>							
Total Savings: All Projects	<b>719,322</b>	606,538	51,837	<b>658,375</b>	54,255	6,693	<b>60,948</b>
Total Savings: Tenant Spaces	<b>4,315</b>	4,465	—	<b>4,465</b>	(150)	—	<b>(150)</b>
Total Savings for Common Areas	<b>715,007</b>	602,073	51,837	<b>653,910</b>	51,405	6,693	<b>61,098</b>
Avg. Project Savings	<b>3,346</b>	5,616	879	<b>3,942</b>	1,644	446	<b>1,270</b>
Avg. Project Savings for Tenant Spaces	<b>20</b>	41	—	<b>26</b>	(4)	—	<b>(3)</b>
Avg. Project Savings for Common Areas	<b>3,235</b>	3,474	4,354	<b>3,824</b>	1,119	2,410	<b>1,222</b>

### 3.3 Comparison of Project Characteristics by Project Site Size and SIR

This section presents a comparison of the attributes of region, market type, and construction type by indicators of project size potential and project owners' return on project investments. This analysis provides context that may aid in understanding how changes in project volumes by project characteristics may influence program savings volumes.

The PE/MCA team developed a framework to categorize projects in terms of potential project size and project owners' return on its investments in those projects. The framework used project site total area square footage data to indicate potential project size, and SIR data to describe project owners' return on their project investments.

Table 3-7 summarizes completed projects in terms of their descriptive statistics, which the PE/MCA team then used to construct a framework. The typical, or median, project had 100,000 total square feet and a median SIR of 1.60; the average project had 178,000 total square feet and a SIR of 1.95.

**Table 3-7. Completed Project Descriptive Statistics for Project Site Total Square Footage and SIR**

Descriptive Statistics	Total Square Footage	SIR
Maximum	1,443,724	10.50
Minimum	6,373	0.50
Average	178,045	1.95*
Median	100,033	1.60
Standard Deviation	225,589	1.90
Upper Quartile (75 <sup>th</sup> Percentile)	191,513	2.13

\* *Average value* is the average of all project SIR values. The calculation of average did not weight data by project costs or project savings.

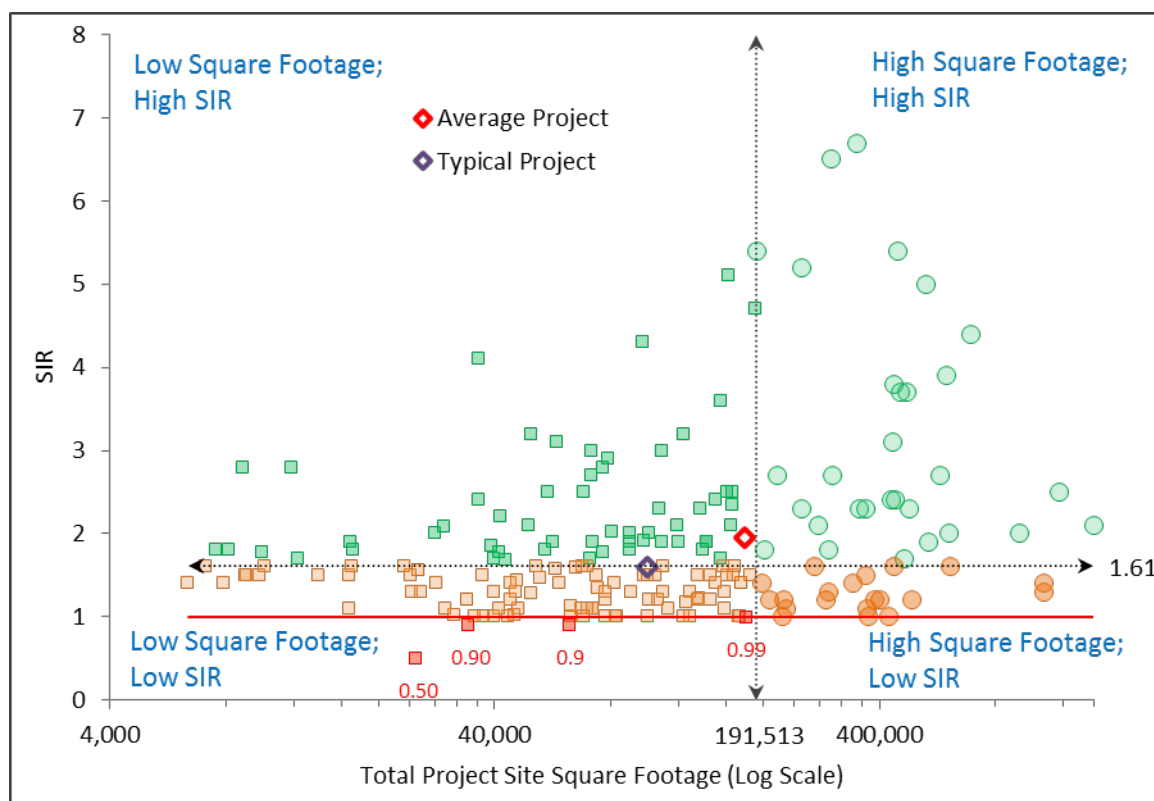
Figure 3-1 illustrates the distribution of completed projects across the dimensions of project SIR and project site total square footage. The PE/MCA team employed a classification framework to categorize projects into one of the four following quadrants:

- **High Total Square Footage and High SIR:** This quadrant, located in the upper right, contains projects with total site-square footage greater than the upper quartile (191,513 feet) and a SIR greater than the median (1.60).
- **High Total Square Footage and Low SIR:** This quadrant, located in the lower right, contains projects with total site-square footage greater than the upper quartile and a SIR equal to or less than the median.

- **Low Total Square Footage and High SIR:** This quadrant, located in the upper left, contains projects with total site-square footage less than or equal to the upper quartile and a SIR greater than the median.
- **Low Total Square Footage and Low SIR:** This quadrant, located in the upper left, contains projects with total site-square footage less than or equal to the upper quartile and a SIR greater than the median.

**Figure 3-1. Classification of Completed Projects by SIR and Project Site Total Square Footage**

Data are completed projects from MPP versions 4 and 5 from the CRIS database. 200 projects had complete data for SIR and total square footage. One project, with a SIR value of 10.5, is not reflected in this figure. Color and shape of data points are used to identify quadrant location of data points, and may aid the reader in determining quadrant location for points that lie on or near dimensional axes



Projects in the lower two quadrants are fairly evenly distributed between 1 and 1.60 SIR; these projects approach the market's limit, or willingness to invest further at lower rates of return. The SIR calculation is an estimate of savings per dollar spent. A SIR of 1 is a break-even point where the project owner receives returns equal to their investments; SIR values greater than 1 reflect returns greater than their total investments. Projects with SIR estimates approaching 1 are potentially risky for project owners, as projects' realization rates may be less than expected. In Figure 3-1, the framework identified four projects with SIR values less than 1 (lower left quadrant). Projects located in the upper two quadrants have higher SIR values,

and further activity in these projects poses less financial risk of causing these projects to result in SIR values less than 1.

Table 3-8 shows project counts by discrete categories of “High” versus “Low” for the variables of total square footage and SIR values; these categories correspond to the quadrants in Figure 3-1. Twenty-five percent (50 projects) were categorized as having high total square footage values; approximately 45% (89 projects) were categorized as having high SIR values. Twenty-nine projects were categorized as having high values for both total square footage and SIR.

**Table 3-8. Projects by Site Total Square Footage and SIR Categories**

Projects	High Total Square Footage		Low Total Square Footage		Total
	High SIR	Low SIR	High SIR	Low SIR	
Projects	29	21	60	90	<b>200</b>

Table 3-9 displays the distribution of projects across the total square footage and SIR categories for each of the key project types (region, market type, and construction type). Market rate projects have the highest percent of projects in the high categories for both total square footage and SIR, and upstate projects have the highest percent of projects in the low categories for both total square footage and SIR.

**Table 3-9. Distribution of Projects by Site Total Square Footage and SIR Categories, and Project Types**

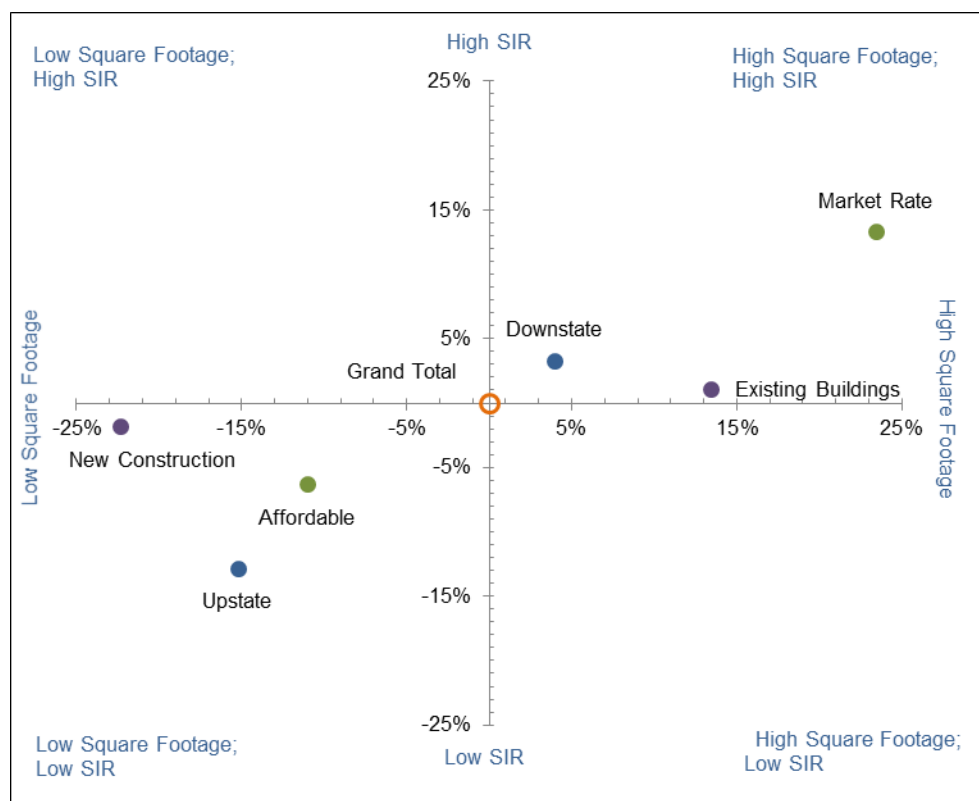
Project Characteristics	Total Projects	High Total Square Footage		Low Total Square Footage	
		High SIR	Low SIR	High SIR	Low SIR
Affordable	136	6%	8%	32%	54%
Market Rate	64	<b>33%</b>	16%	25%	27%
Existing Buildings	125	22%	<b>17%</b>	24%	38%
New Construction	75	3%	0%	<b>40%</b>	57%
Downstate	159	18%	11%	30%	42%
Upstate	41	0%	10%	32%	<b>59%</b>
<b>Total</b>	<b>200</b>	<b>15%</b>	<b>11%</b>	<b>30%</b>	<b>45%</b>

Figure 3-2 illustrates the distribution of project types in relation to the typical project (“Total” in Table 3-9). The space between points represents the relative difference in project type distribution across the framework categories in Table 3-9. This table is helpful for identifying project types with the potential of being large projects (high total site-square footage values) with high rates of return (high SIR values).

As shown in Figure 3-2, relative to the typical project, market rate projects are more likely to fall into the high total square footage and high SIR categories. These projects have high SIR values and therefore are less likely to pose financial risks to project owners from additional project activity. Additionally, these

project sites have more square feet than most projects and therefore are more likely to produce greater savings from further project activity. Conversely, affordable-rate projects tend to be associated with lower SIR values and lower total square footage. Upstate projects are more likely to cluster in the lower left quadrant relative to downstate projects. Upstate project sites in general are smaller than downstate sites and contain a high proportion of affordable rate projects. Existing building and new construction projects differ primarily in terms of project site size and have very similar distributions with respect to SIR values.

**Figure 3-2. Distribution of Project Types Relative to Typical Project across Categories for Total Square Footage and SIR**



### 3.4 Market Assessment Summary

This market assessment describes project site characteristics across the categories of region, market type, and construction type. This summary may inform the program about additional opportunities for targeting savings by project category. Key aspects of each category and an assessment of their potential value to the program are described below:

- **Upstate project sites**, on average, were much smaller than downstate project sites and projects located there tended to have the lowest returns on investments. This may demonstrate that the program has helped these project owners to drive at deeper, more expensive, sources of savings.

- **Downstate project sites**, on average, were larger than upstate project sites and these sites tended to have higher than average returns on investments. These higher SIR values may reflect an opportunity for the program to help these project owners to select additional project activity and get at deeper, more expensive sources of savings.
- **New construction project sites**, on average, represented the smallest project sites across the regions, and returns on investments for this group were slightly lower than average. Additional program efforts to drive at deeper savings from these projects may yield limited overall program savings because new construction sites are currently smaller and average few savings per project.
- **Existing building project sites**, on average, were much larger sites across the regions and returns on investments were slightly higher than average. Additional program efforts to drive at deeper savings from these projects may yield greater overall program savings from relatively larger project sites.
- **Market rate project sites**, on average, were the largest sites and delivered more savings to the program for fewer program dollars. These projects tended to have higher returns on investments; and program efforts to help these project owners get at deeper, more expensive sources of savings likely would produce significantly higher volumes of savings for the program than would investments in affordable rate projects.
- **Affordable rate project sites**, on average, were smaller sites with lower than average returns on investment. This is a likely indication that the program helped these project owners get at deeper, more expensive, sources of savings.

## 4 Staff Interviews

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This chapter describes the PE/MCA team's findings from interviews with program and implementation staff who were involved with MPP. Management and implementation of the program are distributed among NYSERDA MPP staff and three implementation contractors: TRC, Taitem Engineering, and Brand Cool. TRC is generally responsible for management of participating projects at new construction sites; Taitem Engineering is responsible for overall program quality assurance, and Brand Cool is responsible for marketing and lead generation.

### 4.1 Data Collection and Roles of Staff

The PE/MCA team interviewed nine NYSERDA MPP staff members who were responsible for aspects of the program. Among those interviewed were staff who managed the program's budgets, sources of funding, and the program's Partners. The interviews also included staff who oversaw the contracts with the program's implementation contractors, staff who were the first point of contact for interested building owners through the program's hotline, and staff who managed program projects in existing buildings. The PE/MCA team also interviewed 12 staff with the program's three implementation contractors: five TRC staff, five staff of Taitem Engineering, and two staff of Brand Cool (Table 4-1).

**Table 4-1. Number of Staff Interviewed**

Staff	Estimated Population Size	Telephone Interviews Conducted
NYSERDA MPP Staff	>9	9
TRC Staff	>5	5
Taitem Engineering Staff	36	5
Brand Cool Staff	19	2

These organizations work together closely as a single team to run the program. While MPP staff and the three implementation contractors have designated roles and responsibilities (Table 4-2), they interact and communicate regularly with each other, working as one staff. In this chapter, the PE/MCA team distinguishes between NYSERDA's MPP staff and contracting companies when describing duties, but does not distinguish between sources of feedback on the program in an effort to provide anonymity. Sources are reported as "staff" and may be feedback from any of these sources.

**Table 4-2. Program Staff Major Responsibilities**

Organization	New Construction	Existing Buildings	Program Marketing	Quality Assurance	Quality Control
NYSERDA	—	Lead	Contributor	—	Contributor
TRC	Lead	Contributor	Contributor	—	Lead
Brand Cool	—	—	Lead	—	—
Taitem Engineering	—	—		Lead	Contributor

## 4.2 NYSERDA's MPP Staff

For the most part, MPP staff had discrete responsibilities. For example, NYSERDA assigned a different staff person to manage each contract with each specific implementation contractor. The staff member who managed the contract with Brand Cool had overall responsibility for program marketing, while the MPP manager of the Taitem Engineering contract had overall responsibility for program quality control and quality assurance. Responsibilities divided among other MPP staff include: Partner development; management of the GJGNY funds used to support the program; management of RGGI funding and its wait list; and assignment of existing-buildings projects to project managers. In addition to their MPP responsibilities, several interviewed MPP staff also had responsibilities for other, non-MPP NYSERDA programs and activities.

Five of the nine MPP staff interviewed said they also were responsible for management of program projects. Since the launch of version 4 of the program in 2010, MPP staff has primary responsibility for management of projects in the program's existing buildings component. However, some MPP staff also participate in aspects of new construction projects. For example, for a new construction project, a MPP staff person schedules the scoping session, might review the project's ERP, drafts the project's contract, sends out the incentive request forms, and otherwise serves served as a conduit for project documents and communication. Conversely, some implementation staff persons were involved in aspects of projects in existing buildings.

## 4.3 Implementation Staff

The PE/MCA team also interviewed 12 staff with the program's three implementation contractors: five TRC staff, five staff of Taitem Engineering, and two staff of Brand Cool.

### 4.3.1 TRC

TRC staff is primarily responsible for managing the program's new construction component. However, as shown in the following list, specific program responsibilities extended to the existing buildings component as well. Responsibilities of interviewed TRC staff included:

- Overall management of TRC's work with the program.



- New construction project management, which, like management of existing-buildings projects, includes ERP review, Partner communication, and inspections.
- Management of the Partnership network.
- Marketing and outreach to Partners and customers.
- Creating and maintaining ERP modeling and benchmarking tools for existing buildings projects.
- Assisting Partners and NYSERDA staff to use those tools.
- Reviewing ERPs for existing buildings as requested by NYSERDA staff.
- Serving as a management consultant to NYSERDA.

The responsibilities that support existing buildings projects are a legacy of TRC’s management of all Multifamily Program projects under versions 3 and earlier of the program (pre-2010).

Management of the Partner network involves oversight of the Partnership application process, including quarterly application review with staff from NYSERDA and New York State Department of Public Service (DPS), maintaining the list of Partners, monitoring Partner activity, addressing problems with Partners’ work, and meeting Partners’ needs for training and information technology resources and access. New partners are “provisional” until TRC is satisfied with their ability to work with the program. After a provisional Partner’s first ERP, their work is reviewed. Partners may become full Partners after this review and before they complete their first project.<sup>45</sup>

#### 4.3.2 Taitem Engineering

Taitem Engineering staff is responsible for quality assurance (QA) for MPP. Staff defined QA activities as reviews of program processes as a whole to assure they are functioning as intended. Such activities include spot checking ERPs, projects, and sites at different project stages to see if installations were completed correctly, and whether TRC and NYSERDA’s MPP case managers and the program’s Partners are doing their jobs properly.

Taitem does not review a quota of documents or certain types of projects, but chooses “randomly” and attempts to cover a wide range of project types and activities. When a problem is identified, Taitem staff develops processes to address it. Corrective actions may include development of QC procedures, trainings, or presentations for Partners.<sup>46</sup>

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<sup>45</sup> Partner categories are described in more detail in the *Partner Development* section below.

<sup>46</sup> Taitem staff distinguished quality assurance (QA), for which Taitem is responsible, from QC, which they defined as the routine review of project activities, such as scrutiny of applications and ERPs for completeness and accuracy, and onsite inspections to assure compliance with project contracts. QC is the responsibility of the NYSERDA and TRC project teams, but Taitem advises both groups on improving QC procedures.

Taitem staff reported the program's processes were functioning as intended and the program was running smoothly. Partly due to the program's smooth operation, the roles of Taitem staff expanded to include: drafting technical bulletins for Partners ("tech tips"); conducting training at Partner events; providing QC training to Partners and staff; and researching topics of interest to NYSERDA, such as the post-participation performance of buildings that have gone through the program.<sup>47</sup>

### 4.3.3 Brand Cool

Brand Cool became NYSERDA's MPP marketing contractor on March 1, 2011. Interviewed Brand Cool staff are responsible for managing the relationship with NYSERDA and for developing both the strategy and the tactics for program marketing. Tactical responsibilities include creating story opportunities for the trade press, creating content for social media communications, developing case studies, and generating program "leads."

## 4.4 Staff Communication

As the preceding paragraphs indicate, program responsibilities dovetail and overlap between staff of different organizations. This requires ongoing communication and collaboration among all the involved parties. Additionally, staff of the different organizations have varying levels of experience and expertise in the specialized areas required for oversight of applications, ERPs, models, and projects in general. As needed, they seek assistance from other staff within their organization and staff in other organizations involved in MPP who have related or overlapping responsibilities. All of the interviewed staff said this collegial pooling of knowledge helped build close working and collaborative relationships among and between the staffs of the different organizations.

Staff collaborations are fostered by frequent meetings. TRC staff and the marketing team (Brand Cool, TRC, and MPP staff) hold separate weekly meetings. MPP staff host monthly, half-day, "all-hands" meetings to keep all staff informed about current MPP activities, developments, and plans. The marketing and lead generation team holds quarterly strategy meetings; meeting participants share updates biweekly. All of these meetings are continually supplemented by *ad hoc* communication within and between the four organizations.

## 4.5 Marketing

Program marketing includes Brand Cool's work to craft and place program messages in various media, staff communications with potential Partners and participants, and marketing events for customers and Partners.

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<sup>47</sup> Tech tips are based on issues seen in the field and can be about a technology or a missed opportunity.

A common barrier for every commercial energy efficiency program is the low priority saving energy is given relative to other business exigencies. According to staff, helping owners understand what energy efficiency means from a financial point-of-view is the primary challenge. The message Brand Cool uses to overcome this barrier is the emphasis on the solid return on investment participants attain from program participation.

A secondary barrier is owners' concerns that working with a government agency may delay their projects. Staff reported that owners/developers of existing buildings tend to be easier to enroll in the program because they are less concerned that the program might disrupt or delay their construction schedule than are the developers of new construction projects, which often have more aggressive timelines. To overcome this concern, Brand Cool's marketing promotes the ease and timeliness of program participation. One staff person reported that customers like MPP because it helps them successfully navigate bureaucratic processes and provides technical assistance.

Program marketing has evolved and become increasingly sophisticated under Brand Cool's management. After the program's resumption as version 4 in 2010, Brand Cool found limited knowledge of program details in the marketplace. As a result, Brand Cool developed a marketing message that presented version 4 as a new program. Those early messages often talked about property owners' "bottom lines." Since then, there have been a number of efforts to refine and more narrowly target the program's marketing, including:

- Two customer segmentation studies.
- Market research on where multifamily building owners and developers obtain their information.
- Market research the search terms those customers might use to inquire about energy efficiency.
- The use of social media.

A 2012 market segmentation study looked at three functional roles in the multifamily housing market: 1) building owners and managers; 2) building developers; and 3) condominium/cooperative residents and board members. Based on that study and secondary research, Brand Cool placed specific messages where they were most likely to reach those particular types of customers.

A follow-up study in 2013 focused on two of those three groups: building owners/managers and developers. The study subdivided those two groups into five segments and identified two of those segments as most likely to participate.<sup>48</sup> Using the behavioral segmentation results of this study, Brand Cool targeted their marketing messages for 2013 and staff said they plan to continue these efforts.

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<sup>48</sup> The two most likely segments were called "those who value technology" and "those who want to save the planet."

Ongoing efforts are in place to identify prospects' information sources and the search terms they use when seeking energy efficiency information. The use of social media to date has been limited, in part because of its inherent incompatibility with NYSERDA's policies for vetting external communications. The essence of social media is real-time communication. However, as with NYSERDA's other external messaging, NYSERDA may take several weeks to approve a social media topic. Accordingly, social media will likely continue to be used sparingly until a more streamlined message-approval process is instituted.

Other marketing activities include events for Partners and building owners. Day-long "Power Events" for prospective participants and Partners are held three or four times a year in areas staff identified with a high percentage of appropriate building stock. The locations of the events are selected to ensure that all parts of the state receive program marketing; events are not repeated at locations that produced no results. At these events, MPP staff present information about the program to prospective participants during the first half of the day. The second half of the day is devoted to recruiting Partners. In New York City, there also is an evening session for condominium and cooperative owners. Production of these events exemplifies the collaboration between program and implementation staff: Brand Cool organizes the events, sends the invitations, and manages the logistics; MPP staff present the morning program; and TRC staff present the afternoon Partner session.

An even more specifically targeted form of marketing occurs through the lead-generation and support process. Staff distinguishes "leads," that is, prospects for program participation, as "cold," "warm," or "hot." Cold leads come from research or a mailing list; these leads have not independently indicated interest in the program. Warm leads include anyone who has shown interest in the program, such as those who register for, but do not attend, Power Events. Hot leads are prospects who attended a Power Event, who called the program hotline, or whose name was given to staff as a person of interest. The program tracks information about leads, characterizing them as "cold", "warm" and "hot" based on the nature of the contact and the prospective participant's level of interest. TRC engages in "lead nurturing," wherein they continue to develop relationships with leads such as sending warm leads an email following the missed Power Event saying, "Sorry you didn't make it...." Cold and warm leads are also included in a quarterly email marketing blast. Hot leads receive phone calls from staff, as well as the quarterly marketing blasts. Brand Cool is responsible for creating cold leads. TRC is responsible for nurturing warm and hot leads. TRC further categorizes hot leads into subcategories of cold, warm, or hot "opportunities." To improve tracking and identification of the sources and conversion rates of leads, NYSERDA was implementing Microsoft Dynamics as its customer relations management (CRM) system. TRC staff developed the CRM system for NYSERDA.

## 4.6 Partner Development

NYSERDA MPP staff, TRC, Taitem, and Brand Cool staff work together to recruit, train, and communicate with Partners, and to monitor their project work. Staff described four different Partner levels: *provisional*, *full*, *probationary*, and *terminated*. New Partners are provisional until the staff has determined that their skills and ability are sufficient to continue working with the program. Some Partners are provisional not because they are merely new to the program, but because they have challenges working with modeling, the ERP, or another program aspect. After completing stage one of a project (ERP), all of a provisional Partner's work is reviewed. It is possible for Partners to become full Partners after stage one and before they complete their first project.

Partner applications are located on NYSERDA's website. A panel comprising MPP, TRC, and DPS staff review new Partner applications quarterly. Expectations for new Partners have increased since the launch of version 4 of the program. Originally, MPP staff were willing to train Partners and almost all Partner applications were approved. Since then, the expectations for an applicant's credentials are higher, and application review is more rigorous. Applicants must demonstrate they can do the work the program requires of them in order to be approved;<sup>49</sup> about half of the applications pass this screening. To improve this ratio, TRC created an information seminar for prospective Partners.

Partner orientation and communication occur in a number of ways. Quarterly orientations for new Partners rotate between Albany and New York City. These are two-day sessions: one day for existing buildings and one day for new construction projects. Partners may send new employees to the orientations or existing staff for a refresher course. Staff also reported that the ERP review process provides a "great deal" of technical teaching for new Partners.

TRC hosts a monthly webinar with Partners at which Brand Cool presents a high-level view of marketing activity and any metrics that are relevant to the Partners, such as leads that have come into the program, event attendance, and web click-throughs. A technical topic, such as motor efficiency or new furnaces, is presented each month as well. These sessions also serve the program as Partner feedback forums. A "Partner Portal" provides an online repository for documents and records of the monthly webinars.

In addition, program and implementation staffs jointly hold an annual two- to three-day conference or "summit" for Partners. These events provide training to Partners and program participants, and an opportunity for program and implementation staff to hear Partners' feedback.

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<sup>49</sup> For example, one requirement is that a Partner must have at least one staff member who has multifamily BPI certification.

Staff also mentioned Partner training opportunities outside of the program, some of which use curricula developed by MPP staff. The program does not directly offset the tuition costs for individuals who attend these trainings, but it sometimes does so indirectly for all attendees by subsidizing some of the training costs themselves. Nonetheless, both program and implementation staff reported a desire for more Partner training. Through its Workforce Development Program, NYSERDA is supporting efforts to establish more training opportunities, or subsidies for more training. TRC is also developing one-off webinars and onsite trainings on technical topics such as boiler diagnostics and air sealing.

The various program changes described in Section 1.1.5 impose at least a modest learning curve on staff and Partners, but the changes have typically been transparent to the public. Staff reported it has been a greater challenge to communicate the changes to the Partner network than to customers, because a number of the Partners have been with the program since prior versions and are familiar with it, while the general public may not even have known the program existed. Staff reported Partners said it can be challenging to keep up with the changes.

## 4.7 Program Funding

As described in Section 1.1.5, MPP activities have been funded through a variety of funding streams that have included SBC, EEPS, ARRA, RGGI, and GJGNY. Staff described the management and blending of the program's multiple funding streams as a "constant challenge." The challenge extends beyond fund management to management of the expectations of Partners and to maintaining their trust in the program. RGGI funding adds another level of complexity to the program because projects with RGGI funds use different forms than do EEPS-funded projects.

## 4.8 Program Participation

This section describes Program and implementation staffs' perspectives on the steps customers must take to participate in the MPP.

### 4.8.1 Project Applications

A large majority of the program's projects (70%-80% according to one staff member) originate from Partners. This is consistent with program expectations that Partners will take the leading role in the application process. The required contents of an application package are detailed in the program's guidelines. Applications are submitted electronically by Partners to NYSERDA's Comprehensive Residential Information System (CRIS) database, which notifies NYSERDA staff of new applications by automated email.

Program and implementation staffs review new applications for completeness and internal consistency. The turn-around time goals from submission of an application to notification of approval is about a week, though this may vary considerably in practice. Upon approval of an application for a project in an existing building, NYSERDA's Pipeline Assistant assigns a MPP project manager to the project.<sup>50</sup> These assignments are generally made on a geographic basis, although assignments may be adjusted to accommodate each project manager's workload. Project assignments are entered in the CRIS database, which sends an automated message to the assigned project manager. For new construction projects, the CRIS database generates an automated email notice of the application to TRC's project pipeline manager, who assigns the project to a TRC case manager. If construction already has begun, the project cannot go through the Performance path, but must go through the Prescriptive or Modified Prescriptive paths.

#### 4.8.2 Scoping Sessions

For both new construction and existing buildings projects, the CRIS database provides the case or project manager's contact information to the applicant, and MPP staff schedule a scoping session. Scoping sessions are initial meetings that include MPP staff, the project owner, the owner's Partner, and the owner's relevant contractors, such as design-team members. For new construction projects, the TRC case manager also participates in the meeting. Scoping sessions for existing buildings typically occur onsite; for new construction projects, they typically occur by telephone and sometimes through in-person meetings. Scoping sessions first occurred under version 4 of the program.

Scoping sessions serve a number of purposes. They ascertain potential participant interest, identify sources of funding, determine whether additional documents are required, and include a discussion of the program's standards and expectations, the project's scope and timeline, and the path the project will take. Onsite sessions also provide project management staff with the ability to compare building and project details observed during the scoping session to the project's description as it will appear in the ERP. After the scoping session, the project receives a notice to proceed in the form of a letter from NYSERDA, which authorizes the Partner to create an ERP for the project.

#### 4.8.3 ERP and First Incentive Payment

MPP staff review completed ERPs for existing buildings projects; TRC staff review ERPs for new construction projects. NYSERDA project managers sometimes ask TRC staff for assistance with an ERP review, and ERPs for both types of projects receive a follow-up high-level review by NYSERDA staff. The review time for Fast Track projects is less than two weeks. For non-Fast Track projects, the optimal turn-around time for an ERP review is two weeks; it can be longer, depending on staff workloads. Approval of the ERP, if applicable, triggers the first incentive payment.

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<sup>50</sup> In MPP versions 1 – 4, the Senior Project Manager assumed this responsibility.

Following approval of an ERP and encumbrance of incentive funds, NYSERDA issues a notice to proceed with the ERP. A copy of the notice is sent to the project's Partner. The notice to proceed starts two clocks: a 90-day period in which to complete the ERP, and a two-year period in which to complete all of the work in the ERP. Once the ERP is reviewed, and until it is time for an inspection, further staff involvement typically is limited to periodic communication with the Partner to monitor a project's progress.

#### 4.8.4 Inspections and Further Incentive Payments

The first inspection point is about midway through a project. Partners must request the inspection. Inspections occur at 50% completion for existing buildings and before the interior walls are installed for new construction ("open-wall inspection"). For inspections of new construction projects, TRC staff notifies NYSERDA staff of inspection requests and completions. Passage of this inspection triggers a project's second incentive payment. The next inspection occurs after Partners notify staff that a project is "substantially complete." Passage of this inspection triggers payment of the third incentive installment. As described in Section 1.1.5, version 5 added a fourth, year-later, performance incentive for existing buildings.

#### 4.8.5 Market-Rate New Construction

Staff reported difficulty attracting market-rate new construction projects to the program. On further investigation, MPP staff discovered that almost all such projects were going through NYSERDA's New Construction Program (NCP) for commercial buildings. NYSERDA staff from both programs discussed the issue, and agreed that the NCP would not serve multifamily building projects with five or more units in the future.

#### 4.8.6 Data and Tracking

Staff described three databases that house program data or documents. Two of these databases were described earlier in this report; TRC's CRM system is described in Section 4.5 (Program Marketing), and the CRIS database is described in Section 4.8.1 (Project Applications). The third database is NYSERDA's Enterprise Information System (NEIS), which is a repository of all NYSERDA documents and funding announcements. NYSERDA staff, including the project manager, the program director, and contracting and legal staff, review multifamily project documents in NEIS. Staff noted both successes and difficulties with entering and retrieving program data using these three databases.

According to staff, the program could provide a more seamless IT experience for Partners. The issue arises from the low level of access that Partners are allowed with the system, in which they need to go through the project manager for access to documents and data not provided on the Partner Portal. Another reported drawback occurs because the databases are separate and not integrated, which prevents tracking sources of lead generation. As an example, staff reported, "NEIS and CRIS don't speak to each other," which results in time spent manually looking up data in different databases on the same lead.



Regarding CRIS, staff said that information on every measure in an approved ERP must be entered cell-by-cell. As they explained, this is time-consuming and provides opportunities for errors. Before version 4, staff were able to upload entire tables of measures, savings, and other data. However, in version 4 changes were made to the program's spreadsheets that enabled Partners to provide the information needed by the program and reduced the time required to review ERPs, but also had the unintended consequence of requiring staff to enter ERP data cell-by-cell instead of uploading all the data at once. TRC is working to address that unforeseen result of the spreadsheet improvements.

Taitem staff also has experienced difficulties with the CRIS database in tracking projects for their QC work. Those difficulties have arisen both from limitations of CRIS and inconsistencies in the input data. One contact observed, "It isn't always clear what the documents in CRIS are or what they pertain to in a given project." Staff is working to address the problems and reported that NYSERDA was creating a new IT platform to serve as the sole repository of program data.

## 4.9 Program Strengths

Staff expressed pride in the program, and identified a number of program features and results to justify that pride. Notable program strengths mentioned during staff interviews include how program staff is able to make adjustments to program processes to continuously improve program delivery. Staff praised the program's management structure, the wealth of data available, program communications, and the speed with which program staff addressed and solved problems.

The most frequently mentioned "best" program features are its Partner network and its comprehensive whole-building approach to energy efficiency upgrades. Both of those features are foundational in that they underpin the next most frequently mentioned program attributes: its creation of a lasting body of knowledge and its influence beyond the direct effects of program projects.

Regarding knowledge creation, staff described the program's projects as providing "teachable moments" for building owners. Another contact added that the program is "an engine of education and market transformation for owners and for [Partners], giving them knowledge they can apply elsewhere."

Another staff person reported, "One of the greatest legacies of the program may be the data, best practices, and technical tips resulting from it." That contact further reported seeing the program's tech tips "pop up on other people's websites during Google searches." Another staff contact reported seeing the program appear in requests for proposals from organizations in other markets, and a third staff person expressed the opinion that Con Edison's adoption of whole-building incentives is related to the example of NYSERDA's MPP. That contact noted, "There are a lot of the same players that work in [both programs]."

## 4.10 Opportunities for Enhancement

Most staff suggestions for further program improvements related to the Partner network. For example, one contact suggested putting more technical responsibility on Partners because they are the “energy experts.” Another staff person mentioned a Brand Cool survey of building owners that supports giving increased responsibility to Partners. The survey results indicated building owners value the Partners’ advice even more than they value the program’s incentives, which supports a value of trust to place more responsibility for public funds in the hands of private contractors (i.e. Partners).

Other staff described steps that are already under consideration to take greater advantage of Partner experience and expertise. One of those steps is the creation of a Partner advisory group that would act as a focus group for Partner feedback and to test new program ideas. Another step is the development of Partner request forms hosted on the program’s website and sent automatically to Partners to help facilitate the pairing of building owners and Partners. These forms were developed and put into operation in October and November of 2013.

Internal items common among similar programs that impede work include increased reporting requirements, the absence of a training manual for MPP staff, and the limited number of MPP staff. Program staff said the program’s reporting requirements increased as more program funding streams became available, because each funding source required the program to account for expenditures of its funds. Those reports have reduced staff time available for other program activities.

In the absence of a comprehensive training manual for NYSERDA staff, staff created program checklists. Staff said that it would be more effective to provide a single program manual to guide both new staff and those who need a refresher on a task they have not done for a while. These staff also acknowledged that it can be challenging to consolidate and update all of the relevant documents, budgets, and guidelines in one document.

Implementation staff observed that NYSERDA is understaffed for the MPP, at least in regards to managing paperwork. In particular, they suggested it would be helpful to have a full-time NYSERDA staff person to deal with the program’s paperwork, such as ensuring that it is formatted, organized, and labeled consistently.

Confusion among customers between NYSERDA’s MPP and the typically one-off upgrade programs offered by utilities was also reported by staff as an opportunity for improvement. More fundamentally, staff postulated that customer confusion is believed to persist because of staff and funding limitations in NYSERDA’s corporate communications department, which conducts overall program marketing. MPP is unable to address that confusion directly because, as one program staff said, “the consumer relationship is owned by corporate.” In addition, MPP’s advertising efforts do not directly target end-use customers. This lack of publicity could be giving utilities an advantage over MPP, particularly for participants concerned

about their building's possible inability to achieve 15% energy savings; these participants may choose a utility program without much consideration of MPP. More publicity of MPP to potential participants, and more collaboration with utility programs, could enable staff to more effectively communicate program differences to potential clients and could help to reduce confusion among potential participants.

## 4.11 Summary

The findings in this chapter are based on 21 interviews with NYSERDA's MPP staff and staff of three implementation contractors who have responsibilities with MPP. MPP staff have overall program responsibility, particularly for managing existing buildings projects and the program's funding streams, contracts, and budgets. As noted above, three program implementation contractors also actively serve the program: TRC, which is responsible for management of projects in new or substantially renovated buildings; Taitem Engineering, which is responsible for overall quality assurance; and Brand Cool, which is responsible for program marketing and lead generation.

Staff communication and collaboration within and between organizations is frequent and effective. The resulting collegial pooling of knowledge and experience is fostered and supported by frequent, regularly scheduled meetings. According to contacts with Taitem Engineering, the program's processes are functioning as intended and the program is running smoothly.

Program marketing has evolved and become increasingly sophisticated under Brand Cool's management since March 1, 2011. In addition to Brand Cool's work to craft and place program messages in various media, Program marketing includes communication and periodic events for customers and Partners by staff from all four organizations.

Likewise, all four organizations work together to recruit, train, and communicate with Partners, and to monitor their project work. Expectations of new Partners have increased since the launch of version 4 of the program. Originally, NYSERDA was willing to train Partners and approved almost all Partner applications. In version 5 of MPP, NYSERDA raised its expectations of Partner applicants' credentials and made its Partner applicant review process more rigorous, and Partner applicants must demonstrate they can do the required program work.

The program's awareness of, and responsiveness to, market conditions are reflected in the program changes that have occurred from version 4 to version 5. For owners of participating existing buildings, the biggest changes have been:

- Elimination of the audit-only incentive payment.
- Increased incentives, including significantly increased incentives for affordable-housing firm-gas buildings.

- Restoration of a performance incentive based on a year-after billing analysis.
- Introduction of a Fast-Track path to reduce expensive modeling costs for buildings with fewer than 50 units.

For developers who do gut rehabilitations, the program's new construction component introduced a Modified Prescriptive path. That path allows the developer to avoid the strict building envelope requirements of the program's Prescriptive path as long as the building's external walls are not modified by the project.

For staff, the program's greatest challenges include: maintaining consistency of program data across three discrete databases; managing the program's multiple funding streams (EEPS, GJGNY, RGGI); communicating the program's incremental changes to Partners; attracting market-rate new construction projects; and especially for NYSERDA staff, managing the volume of their work.

Program staff expressed pride in the program and in its work, and named a number of program features and results to justify that pride. These include the program's Partner network and its comprehensive whole-building approach to energy efficiency upgrades. Those features are foundational in that they underpin two other program attributes: creation of a lasting body of knowledge and its influence beyond the direct effects of program projects.

## 5 Partner Interviews and Surveys

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### 5.1 Introduction

MPP relies on a network of energy consulting firms, or Multifamily Performance Partners (Partners), with the qualifications to provide comprehensive energy efficiency services to assist MPP clients, such as building owners, property managers, and developers. In order to qualify, a potential Partner firm must have acted in a lead capacity on at least three multifamily projects for which a comprehensive energy efficiency scope of work was developed and fully implemented. Partners that do not meet this qualification can provide an explicit plan for how they will transfer the experience they do have in the multifamily sector into their role as a Partner.

A Partner's role in the program is to guide clients through the program processes. They provide services that include: application submission; facilitation of a project scoping session and site visit; benchmarking and energy modeling; development of an Energy Reduction Plan (ERP); execution of contract documents and invoices; and inspection of installed energy-saving measures. The PE/MCA team interviewed or surveyed nearly half of the Partners that have been accepted into MPP about: their business and services before becoming a Partner; what changed since becoming a Partner; their services outside of MPP; their interaction with various aspects of versions 4 and 5 of the program; barriers to participation in MPP; and, if applicable, why they are no longer active with MPP.

#### 5.1.1 Types of Partners

The PE/MCA team differentiated Partners based on their eligibility to participate in the program, and their MPP experience and activity. Experience is based on the total number of MPP projects Partners have completed. "Experienced" Partners have completed more than one project and "Inexperienced" Partners have completed one or no projects, but may have one or more in progress. "Active" Partners had at least one project in the pipeline at the time the sample was compiled in April 2013; "Inactive" Partners did not have a project in the pipeline. "Eligible" Partners are permitted to complete their ongoing projects and take on new projects, and "Ineligible" Partners are those who have been "Permanently Removed" from the program and are not permitted to take on new projects. Combinations of these Partner characteristics yield five Partner types:

- Experienced, Active, and Eligible (Experienced/Active) Partners.
- Experienced, Inactive, and Eligible (Experienced/Inactive) Partners.
- Inexperienced, Active, and Eligible (Inexperienced/Active) Partners.
- Inexperienced, Inactive, and Eligible (Inexperienced/Inactive) Partners.
- Inexperienced, Inactive, and Permanently Removed (Permanently Removed) Partners.

Table 5-1 displays the total number of MPP Partners and percent of projects in each Partner type group in MPP versions 1 to 5.

**Table 5-1. MPP Partners and Projects across Partner Types, MPP Versions 1 to 5**

Source: CRIS database, 4/25/2013

Characteristic	Experienced Partners		Inexperienced Partners		Permanently Removed	Total
	Active	Inactive	Active	Inactive		
Number of Partners	31	20	8	28	18	<b>105</b>
Percent of Total	29%	19%	8%	27%	17%	<b>100%</b>
Number of Projects <sup>a</sup>	1,141	48	18	6	7	<b>1,214</b>
Percent of Total	94%	4%	1%	0.5%	0.1%	<b>100%</b>

<sup>a</sup> Completed and in-progress projects

### 5.1.2 Data Collection and Analysis

There were 105 MPP Partners at the time the PE/MCA team compiled a list of Partners in April 2013, including the Permanently Removed Partners (Table 5-1). Between June and December 2013, the PE/MCA team interviewed or surveyed 50 Partners who account for the majority of MPP projects overall and in versions 4 and 4 (Table 5-2; Figure 5-2). First, the research team conducted in-depth interviews between one to two hours in length with seven of the Experienced/Active Partners who had been the most active in MPP. The research team used the data from these interviews to design a telephone survey, and surveyed an additional 15 Experienced/Active Partners, 11 Experienced/Inactive Partners, and three Inexperienced/Active Partners; the surveys ranged between 30 minutes and 1.5 hours. The PE/MCA team also designed semi-structured interview guides for Inexperienced/Inactive Partners and Permanently Removed Partners, and interviewed 12 contacts in these Partner groups; the interviews ranged between 15 minutes and 45 minutes.

The PE/MCA team called all 105 Partners in the sample list until a quota of 50 was met, with the goal of collecting data from each of the Partner types, but with an overemphasis on the most experienced Partners. The 50 Partners interviewed account for the majority (87%) of MPP projects in program versions 1 through 5. Interview and survey guides are in Appendix A.

Due to the different data collection methods the PE/MCA team employed, and due to screening questions in the surveys, the 50 Partners interviewed did not receive the same questions. In the analyses below, we denote the number of Partners who was asked each question.

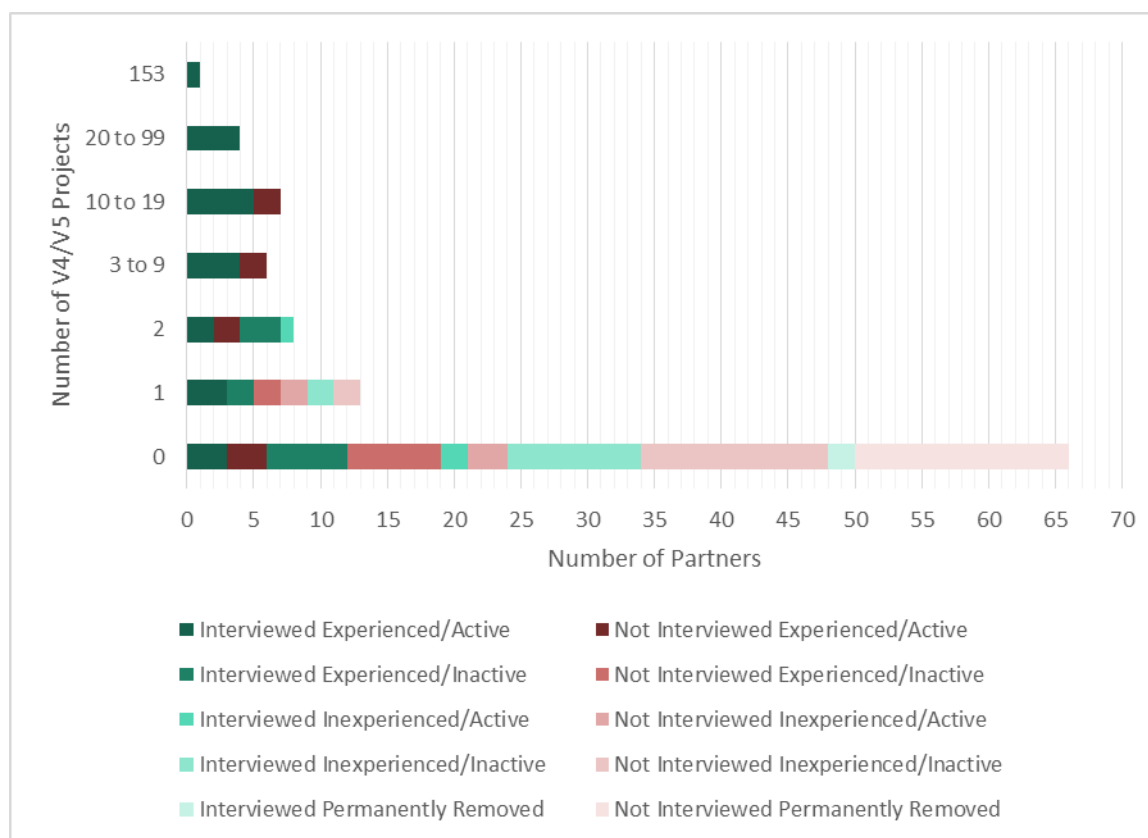
**Table 5-2. MPP Partners and Projects by Data Collection Method and Partner Type, Versions 1 to 5**

Source: CRIS database, 4/25/2013

Partner Type	Interviewed		Surveyed		Not Interviewed or Surveyed	
	Partners	Projects	Partners	Projects	Partners	Projects
Experienced / Active	7	510	15	516	9	115
Experienced / Inactive	—	—	11	24	9	24
Inexperienced / Active	—	—	3	5	5	13
Inexperienced / Inactive	12 <sup>a</sup>	4	—	—	16 <sup>b</sup>	2
Permanently Removed	2	0	—	—	16	1
<b>Total</b>	<b>21</b>	<b>514</b>	<b>29</b>	<b>545</b>	<b>55</b>	<b>155</b>

<sup>a</sup> Nine Partners had no projects.<sup>b</sup> Twelve Partners had no projects.**Figure 5-1. Number of Interviewed and Not Interviewed Partners by Project Totals in MPP Version 4 and 5**

Source: CRIS database, 4/25/2013



In each analysis phase, the research team studied differences based on Partner type, project volume, and building size in versions 4 and 5, and the geographic service territory in New York State, except for Inexperienced/Inactive and Permanently Removed Partners. The team analyzed the data from the semi-structured interviews with Inexperienced/Inactive and Permanently Removed Partners separately because the questions were different from those asked of other Partner types.

After identifying Partners by type, the PE/MCA team found that slightly less than half (44%) are Experienced/Active, 22% are Experienced/Inactive, 24% are Inexperienced/Inactive, 6% are Inexperienced/Active, and 4% are Permanently Removed. To determine project volume, the research team divided Partners into three categories:

- High-volume Partners who completed more than 40 projects.
- Medium-volume Partners who completed between 11 and 40 projects.
- Low-volume Partners who completed between 1 and 11 projects.

As shown in Table 5-3, slightly more than two-thirds of all Partners were low-volume and a minority of Experienced/Active Partners was medium- or high-volume. To determine building size, the research team divided Partners into three categories, based on the average number of units in buildings across all projects they completed in versions 4 and 5:

- Large-building Partners whose average number of units per building is greater than 300.
- Medium-building Partners whose average number of units per building is between 50 and 300.
- Small-building Partners whose average number of units per building is between 5 and 49.

**Table 5-3. MPP Partner Project and Service Territory Characteristics by MPP Partner Type, Versions 4 and 5**

Characteristic	Experienced Partners		Inexperienced Partners		Permanently Removed	Total
	Active	Inactive	Active	Inactive		
Partner type	44% (22/50)	22% (11/50)	6% (3/50)	24% (12/50)	4% (2/50)	<b>100%</b>
Low-volume (1 to 10)	53% (10/19)	100% (6/6)	100% (2/2)	N/A	N/A	<b>70%</b>
Medium-volume (11 to 40)	26% (5/19)	0% (0/6)	0% (0/2)	N/A	N/A	<b>19%</b>
High-volume (41 or more)	21% (4/19)	0% (0/6)	0% (0/2)	N/A	N/A	<b>15%</b>
continued						



Characteristic	Experienced Partners		Inexperienced Partners		Permanently Removed	Total
	Active	Inactive	Active	Inactive		
Small-building (majority between 5 and 50 units)	21% (4/19)	17% (1/6)	50% (1/2)	N/A	N/A	<b>22%</b>
Medium-building (majority between 51 and 300 units)	58% (11/19)	50% (3/6)	0% (0/2)	N/A	N/A	<b>52%</b>
Large-building (majority over 300 units)	21% (4/19)	33% (2/6)	50% (1/2)	N/A	N/A	<b>26%</b>
<b>Geographic Coverage</b>						
Statewide	68% (15/22)	73% (8/11)	33% (1/3)	N/A	N/A	<b>70%</b>
Downstate-only	18% (4/22)	18% (2/11)	67% (2/3)	N/A	N/A	<b>18%</b>
Upstate-only	14% (3/22)	9% (1/11)	0% (0/3)	N/A	N/A	<b>12%</b>

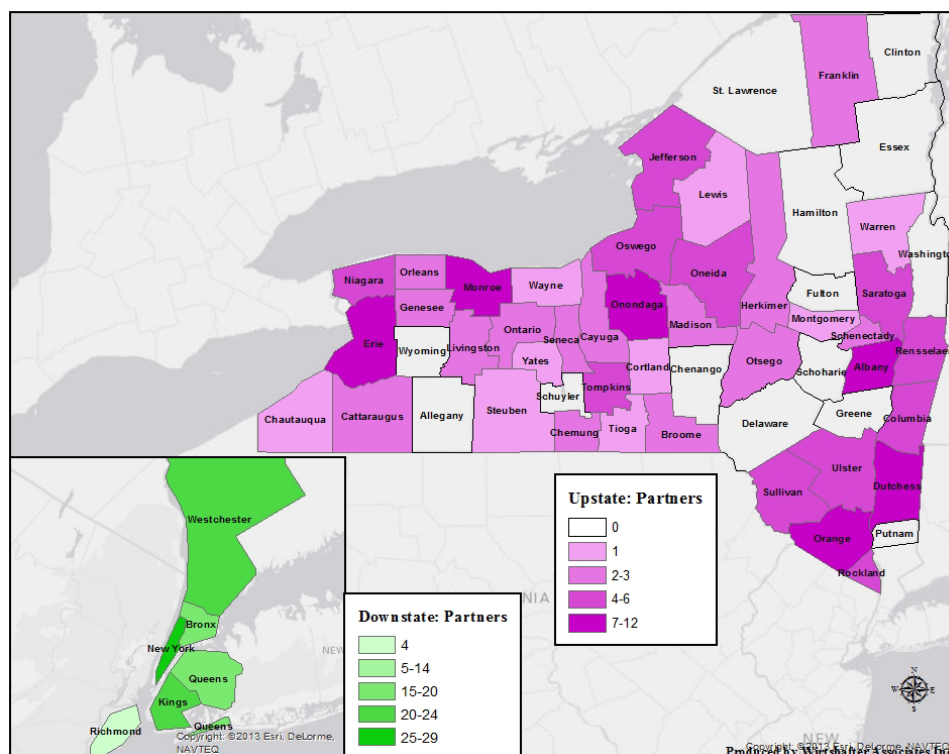
More than half of all Partners were medium-building Partners, with the exception of Inexperienced/Active Partners, who were evenly split between the small- and large-building categories (Table 5-3). A minority of Experienced/Active and Experienced/Inactive Partners was in the small- or large-building Partner category. The PE/MCA team also divided Partners into three categories by geographic service territory:

- Downstate-only Partners are those who limit their service territory to the five boroughs of New York City and Westchester County.
- Upstate-only Partners are those who limit their service territory to all remaining counties in New York, except Nassau & Suffolk Counties in Long Island.
- Statewide Partners have a service territory that extends into both the downstate and upstate regions.

More than two-thirds of all the Partners interviewed said they served clients statewide, although two-thirds of Inexperienced/Active Partners covered downstate areas only (Table 5-3). A small minority of Experienced/Active and Experienced/Inactive Partners covered downstate-only or upstate-only areas. As shown in Figure 5-2, Partners have been most active with MPP projects in downstate New York. The counties to the north of Westchester County, as well as the Syracuse, Rochester, and Buffalo areas, have experienced higher levels of Partner MPP activity compared to the remainder of upstate New York; a few upstate counties have not had any version 4 or 5 projects likely due to the relatively lower number of multifamily buildings and people residing in these counties. In the analyses below, substantial differences based on Partner type, project volume, building size, and geographic coverage are reported only where they occur.

**Figure 5-2. Number of Partners with at Least One MPP Project in County, MPP Versions 4 and 5**

Source: CRIS Database, 12/20/2013



## 5.2 Partner Characteristics

### 5.2.1 Firmographics, Services Provided, and Experience with MPP and Other Programs

The Partner firms the PE/MCA team interviewed and surveyed reported various firm sizes, services provided, experience with MPP, and experience with other energy efficiency programs in New York State. The PE/MCA team asked Partners several questions regarding these topics to understand Partner firm characteristics and experience across Partner types.

#### 5.2.1.1 Firmographics

The average number of employees in Partner firms that serve clients in New York State is 38. This is consistent across Partner types, except Inexperienced/Inactive Partners (Table 5-4). Inexperienced/Inactive Partner firms had an average of 114 employees who served clients in the State and three of these firms employed more than 120 employees in the State. The smallest Partner firm interviewed had one employee who served clients in the State and the largest Partner firm had 500 employees serving clients in the State.

**Table 5-4. Partner Firm Characteristics**

Characteristic	Experienced Partners		Inexperienced Partners		Permanently Removed	Total
	Active	Inactive	Active	Inactive		
Average Number of employees serving clients in NYS	34	31	32	114	23	<b>38</b>
Range of employees serving clients in NYS	5 to 80	1 to 200	2 to 75	4 to 500	1 to 44	<b>N/A</b>
Average percent of total NYS employees in MF	66%	85%	55%	70%	60%	<b>71%</b>
Average percent of total NYS employees in MPP	37%	65%	55%	Not asked	Not asked	<b>48%</b>
Average percent of total business that is MF	49%	37%	78%	37%	Not asked	<b>45%</b>
Average percent of MF business that is MPP	33%	16%	20%	4%	Not asked	<b>21%</b>

Of the total employees who served clients in New York State, a majority across all Partner types worked in the multifamily sector. Moreover, about half of the total employees who served clients in the State across all Partner types worked on MPP projects, although the percent was substantially lower (37%) for Experienced/Active Partners.

Partners also reported that about half of their firm's business was, on average, in the multifamily sector (Table 5-4). This was higher for Inexperienced/Active Partners and lower for Experienced/Inactive and Inexperienced/Inactive Partners. Partner contacts said that MPP accounted for an average of 21% of their firms' multifamily business; the percent was greater for Experienced/Active Partners and lower for Inexperienced/Inactive Partners.

### 5.2.1.2 Services Provided

A large majority of Partners offered services that are central to their role as Partners in MPP: whole building modeling, building or system energy audits, and project oversight (Table 5-5).

**Table 5-5. Services Provided by Partners, by Partner Type<sup>a</sup>**

Service	Experienced Partners		Inexperienced Partners		Total
	Active	Inactive	Active	Inactive	
Whole-building modeling	100% (19/19)	100% (11/11)	100% (3/3)	100% (12/12)	<b>100%</b>
Building or system energy audits	100% (20/20)	91% (10/11)	100% (3/3)	83% (10/12)	<b>96%</b>
Project oversight	73% (16/22)	91% (10/11)	66% (2/3)	83% (10/12)	<b>81%</b>
Retrofit engineering design	78% (14/18)	64% (7/11)	100% (3/3)	67% (8/12)	<b>77%</b>
Retro-commissioning services	72% (13/18)	73% (8/11)	100% (3/3)	75% (9/12)	<b>74%</b>
New building engineering design	67% (12/18)	73% (8/11)	66% (2/3)	50% (6/12)	<b>67%</b>
Renovations or remodeling	53% (8/15)	64% (7/11)	0% (0/3)	Not asked	<b>59%</b>
LEED building design	58% (11/19)	55% (6/11)	33% (1/3)	75% (9/12)	<b>59%</b>
New building construction	50% (9/18)	36% (4/11)	0% (0/3)	Not asked	<b>45%</b>
Retrofit architectural design	22% (4/18)	36% (4/11)	66% (2/3)	33% (4/12)	<b>36%</b>
Installation of equipment	37% (7/19)	27% (3/11)	0% (0/3)	0% (0/12)	<b>31%</b>
New building architectural design	24% (4/17)	36% (4/11)	0% (0/3)	17% (2/12)	<b>28%</b>

<sup>a</sup> Permanently Removed Partners were not asked these questions.

These services showed very little variation across Partner types. The percentage of Partners offering the remaining services in Table 5-5 varies substantially across Partner types, but trends show that more of the Experienced/Active and Experienced/Inactive Partners tended to offer these services, with the exception of retrofit architectural design. Overall:

- About three-fourths of Partners offered retrofit engineering design services and retro-commissioning services.
- Two-thirds provided new building engineering design services.
- More than half offered renovations or remodeling services and LEED building design services.
- Less than half provided new building construction services.
- About one-third offered retrofit architectural design services and installation of equipment.
- Slightly more than one-fourth provided new building architectural design services.

In addition, high-volume Partners and large-building Partners reported offering more of these services than did the low-volume Partners and medium- and small-building Partners.

### 5.2.1.3 Experience with MPP

The PE/MCA team combined Partner interview and survey data with data from NYSERDA's Comprehensive Residential Information System (CRIS) database, to determine Partner experience with versions 4 and 5 of MPP. The measures for Partner experience are greater for the most experienced Partners compared to less experienced Partners (Table 5-6).

**Table 5-6. Partner Experience in MPP, by Partner Type**

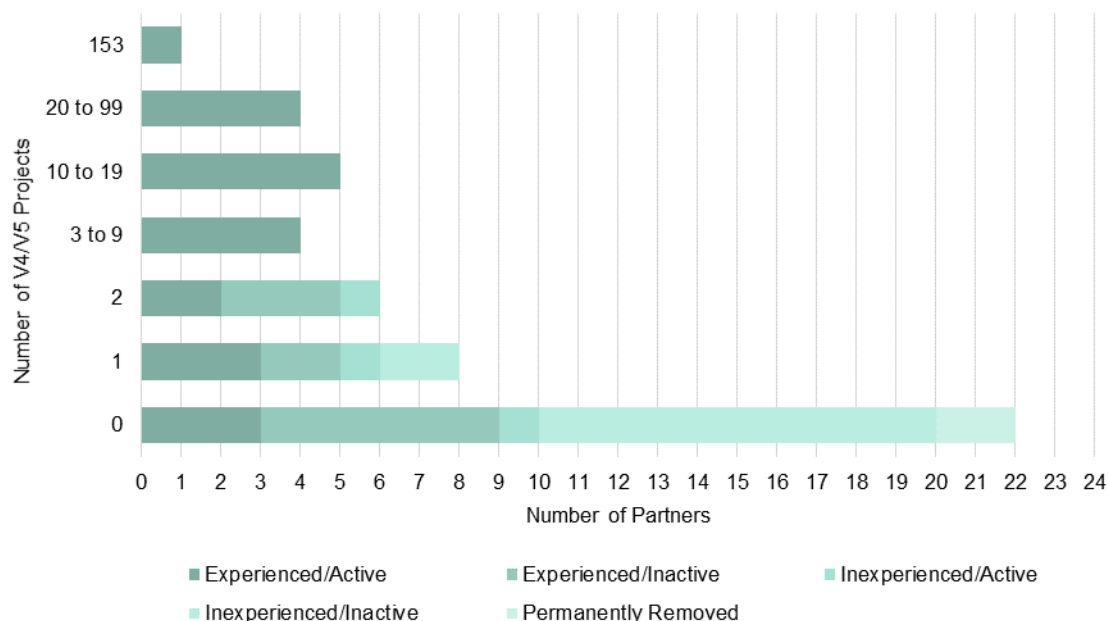
Characteristic	Experienced Partners		Inexperienced Partners		Permanently Removed	Total
	Active	Inactive	Active	Inactive		
Average years in MPP	6.4 <sup>a</sup>	5 <sup>a</sup>	4	2	2	4.2
Average number of projects in V4/V5	39	1.9	1	0.2	0	N/A
Range of projects in V4/V5	0 to 153	0 to 5	1	0 to 1	N/A	N/A
Average number of new construction projects in V4/V5	13	0.5	0	N/A	N/A	N/A
Average number of existing building projects in V4/V5	26	1.4	1	N/A	N/A	N/A
Average number of market-rate projects in V4/V5	11	0.7	0.67	N/A	N/A	N/A
Average number of affordable-rate projects in V4/V5	28	1.2	0.33	N/A	N/A	N/A

<sup>a</sup> Some Partners started with AMP, the predecessor to MPP.

On average, Partners had been involved in MPP for 4.2 years (Table 5-6), and large-building Partners reported being in the program longer than medium- or small-building Partners. Experienced/Active Partners had 39 projects on average (with a range of 0 to 163 projects), compared to 1.9 for Experienced/Inactive Partners (with a range of 0 to 5 projects), 1 for Inexperienced/Active Partners, and 0.2 for Inexperienced/Inactive Partners (with a range of 0 to 1 projects). Statewide Partners also reported more projects on average than downstate- or upstate-only Partners. The majority of projects across all Partner types were existing buildings and affordable-rate, compared to new construction and market-rate, respectively (Table 5-6). The exception is Inexperienced/Active Partners, for whom the average majority of projects were market-rate. In addition, as shown in Figure 5-3, the majority of MPP version 4 and 5 projects (91%) were performed by ten Experienced/Active Partners.

**Figure 5-3. Number of MPP Version 4 and 5 Projects and Interviewed Partners, by Partner Type**

Source: CRIS database, 12/20/2013



#### 5.2.1.4 Experience with Other NYSERDA or Utility Programs

About two-thirds of Partners also reported they had been involved in other NYSERDA or utility programs in New York State (Table 5-7 and Table 5-8, respectively). Large majorities of Experienced/Active Partners (95%) and Experienced/Inactive Partners (64%) reported involvement in NYSERDA programs, while large majorities of Experienced/Active (74%), Experienced/Inactive (64%), and Inexperienced/Active Partners (100%) reported involvement in utility programs in the State. Partners most frequently identified NYSERDA programs Home Performance with ENERGY STAR, New Construction, Existing Facilities, and Flexible Technical Assistance. A few Partners also mentioned EmPower, Small Commercial Energy Efficiency, Low Rise Residential New Construction, Industrial & Process Efficiency, On-Site Power Applications, Advanced Submetering, and Buildings Research & Development. The most common utility programs Partners reported were from Consolidated Edison (ConEdison) and National Grid; a few Partners also mentioned New York Power Authority, New York State Electric & Gas Corporation, and Orange and Rockland Utilities programs.

**Table 5-7. Partner Experience in Other NYSERDA Energy Efficiency Programs<sup>a</sup>**

Experience	Experienced Partners		Inexperienced Partners		Total
	Active	Inactive	Active	Inactive	
Involved in other NYSERDA programs	95%	64%	33%	39%	<b>69%</b>
NYSERDA programs	Home Performance with ENERGY STAR (12); New Construction (11), Existing Facilities (10); Flexible Technical Assistance (10); EmPower (7); Small Commercial Energy Efficiency (3); Low Rise Residential New Construction (3); Industrial & Process Efficiency (1); On-Site Power Applications (1); Advanced Submetering (1); and, Buildings Research & Development (1)				<b>N/A</b>

<sup>a</sup> Permanently Removed Partners were not asked these questions.

**Table 5-8. Partner Experience in Other New York-Based Utility Energy Efficiency Programs<sup>a</sup>**

Experience	Experienced Partners		Inexperienced Partners		Total
	Active	Inactive	Active	Inactive	
Involved in utility programs	74%	64%	100%	24%	<b>66%</b>
Utility programs?	ConEdison (18); National Grid (15); New York Power Authority (5); New York State Electric & Gas Corporation (3); and Orange and Rockland Utilities programs (1)				<b>N/A</b>

<sup>a</sup> Permanently Removed Partners were not asked these questions.

## 5.2.2 Reasons to Be a Partner

Of the motivations that Partners cited for becoming a Partner, three were common across all Partner types.

- First, the most common reason cited by Partners for joining MPP was to meet demand or client needs in an effort to grow their business. Some Partners reported that clients approached them with a multifamily project and asked about incentives or other services, and Partners would join MPP to offer the incentives to clients.
- Second, some Partners also reported that they wanted to actively expand their services into the multifamily sector. As discussed below, many Partners already were providing services in other sectors and learned that MPP provided avenues to expand their business into multifamily buildings.
- Third, Partners reported that they thought MPP offered a way to receive training in energy-efficient services supported by MPP. While formal training is not offered per se, Partners reported that they learned valuable skills regarding multifamily energy efficiency services through their participation in MPP and particular components, such as webinars and Partner conferences.

Partners stated other reasons for joining MPP. For example, a minority of the Experienced/Active Partners reported starting their firm as a Partner in AMP or MPP to enter the multifamily sector. A minority of Experienced/Inactive Partners reported joining MPP to: help clients' buildings comply with Local Laws and/or changes to Combined Heat and Power-related (CHP) laws; to network with other businesses in the multifamily sector; and to use the NYSERDA branding to attract more business.

## 5.3 Program Processes

The research team asked Partners about their experiences with program processes, including workflow, communications and training, and marketing, to determine how Partners engage and participate with the program, and to obtain their feedback about improvements that could facilitate their participation in MPP.

### 5.3.1 Workflow Processes

Partners reported their experiences with various aspects of the process of guiding a project through MPP. These processes include: initial client screening; the MPP application process; assistance with financing a project; Prescriptive and Fast Track path processes; the scoping session and ERP; approval of measures; and reporting, testing, verification, and inspection processes.

#### 5.3.1.1 Client Screening

One of the first steps in the MPP process is to obtain qualified clients through client outreach and screening. On average, the Inexperienced/Active Partners reported screening out about 90% of potential clients while Experienced/Inactive Partners screened out 24% of potential clients. The most experienced Experienced/Active Partners screened out about half of potential clients. Downstate-only Partners, small-building Partners, and low-volume Partners also said they screened out a greater percentage of potential clients compared to statewide or upstate-only Partners, large- or medium-volume Partners, or high- or medium-volume Partners.

Partners used several screening criteria to determine if a potential client would qualify to participate in MPP and would be a good fit for the Partner's capabilities. Contacts in all Partner types mentioned using the screening criteria related to the characteristics of the building(s), such as building size and number of units, whether the building is firm gas or oil-based, and current energy usage and equipment in the building (in existing buildings). Experienced/Active and Inexperienced/Active Partners also mentioned the anticipated time it would take to complete the project and how far along the project is toward being completed as important screening criteria. One Inexperienced/Active Partner also reported using the availability of financing as a screening criterion.

All Partner types explained that they used phone interviews (100%) and site visits (81%) to screen projects, and about one-third of the Partners mentioned using a brief onsite energy audit as a screening method. Two Experienced/Active Partners reported using additional screening methods: one Experienced/Active Partner



mentioned using a decision tree model that included fees, incentives, and benefits; another Experienced/Active Partner designed a questionnaire for clients. One Experienced/Active and one Experienced/Inactive Partner indicated that they used to perform brief MPP-incented onsite audits, but stopped the practice when MPP discontinued the incentives for the audits.

Partners also identified two primary reasons that potential clients are screened out from participating in MPP. First, buildings do not meet MPP criteria regarding building size, project timeline, and other building characteristics such as fuel type and ownership type. For example, one Experienced/Active Partner mentioned that some clients, especially condominiums and cooperatives, are “too disorganized to reach consensus” on various aspects of a project, such as the scope of work and types of equipment to be installed. Second, Partners reported that some clients wanted to make improvements that would not achieve MPP’s required minimum of 15% energy savings or, less frequently, wanted to do more work than MPP would incent but could not afford the extra improvements.

### 5.3.1.2 Application Process

The second main step in the MPP process involves submitting an application to and receiving approval from TRC for new construction projects or from NYSERDA for existing building projects. More than half of all Partners reported not having an issue with application submission (57%) and approval (64%) processes (Table 5-9).

Slightly less than half of Partners (mostly Experienced/Active and Experienced/Inactive) reported issues with the application submission (43%) processes (Table 5-9). The most common was that the application form was too complicated, with too many guidelines and parameters. One large-building Experienced/Active Partner said it was too easy to make mistakes on the application form because of its complexity. Another commonly reported issue was the amount of time it took to get everyone involved in the project to sign the application, which often caused delays in submission. This issue was mentioned more frequently by high-volume and large-building Partners. An Experienced/Active Partner also said they sometimes were uncertain about what information they had to include on the form, which also caused delays.

Other issues involved the technical aspects of the form. One Experienced/Active Partner reported that it was difficult to save data or copy data from one form to another; another Experienced/Active Partner mentioned that the PDF forms were not fillable, which created extra work for them. One Experienced/Active Partner reported that the Electronic Funds Transfer form that accompanies the application form can be misleading to some clients, since it appears to grant NYSERDA access to the client’s account(s) rather than simply granting NYSERDA access to direct-deposit funds in the account(s).

**Table 5-9. Partners Reporting Issues with MPP Application Submission and Approval, by Partner Type<sup>a</sup>**

Issue	Experienced Partners		Inexperienced Partners		Total
	Active	Inactive	Active	Inactive	
Reported issues with submission:	47% (9/19)	45% (6/11)	0% (0/3)	0% (0/2)	<b>43%</b>
▪ Form too complicated	4	3	N/A	N/A	<b>7</b>
▪ Delays in sign-off	3	2	N/A	N/A	<b>5</b>
▪ Technical issues with form	2	2	N/A	N/A	<b>4</b>
Reported issues with approval:	40% (8/20)	36% (4/11)	33% (1/3)	0% (0/2)	<b>36%</b>
▪ Delays in approval	6	4	1	N/A	<b>11</b>
▪ Variation in approvals	2	0	0	N/A	<b>2</b>

<sup>a</sup> Permanently Removed Partners were not asked these questions.

About one-third of Partners (36%) reported having an issue with the application approval process (Table 5-9). A common issue was that approval of submitted applications took too long. This was cited more frequently by high-volume and large-building Partners. These Partners mentioned three common reasons for these delays. First, the income qualification for affordable-rate projects can add substantial time to the approval process. Second, the time spent revising and resubmitting the application for approval can be substantial, particularly when, as one Partner suggested, the “comments from reviewers are not constructive [or actionable].” Third, Partners said TRC and NYSEDA did not have enough staff to approve applications quickly, and two Partners suggested that this was particularly true for TRC.

Experienced/Active Partners also indicated that MPP staffs’ responses to applications vary significantly, possibly through inconsistent methods of approval across staff persons. For example, one of these Partners said that program staff had approved the type and level of information in their application for one project, but a different staff person had rejected that same type and level of information for a different project. However, MPP hired a Pipeline Administrator who is responsible for processing and approving all applications, which should help mitigate this issue for Partners.

### 5.3.1.3 Assistance with Financing

Before moving forward with an MPP project, some clients need to secure outside funding for their projects. Two-thirds of Partners (67%) reported that the majority of their MPP clients needed to borrow funds to complete their projects; a substantially lower percentage of Inexperienced/Active Partners noted this issue than did Experienced/Active and Experienced/Inactive Partners (Table 5-10). Of the Partners whose clients often need to borrow funds, 71% reported they helped their clients secure additional funds. Most often, they recommended a variety of funding sources. From the most to the least common, these were: local and federal government options, private banks, NYSEDA loans, Energy Smart loans, and Green Jobs Green

New York (GJGNY). One Partner firm also wrote letters to financial institutions on their client's behalf. In addition, the securing of additional financing can lead to delays in the application process as client's need to have financing in place before moving forward with the project.

**Table 5-10. Partners' Assistance with Financing, by Partner Type<sup>a</sup>**

Assistance	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Majority of clients need borrowed money to complete projects	71% (5/7)	75% (6/8)	33% (1/3)	<b>67%</b>
Help clients get additional funding when needed:	67% (4/6)	83% (5/6)	100% (1/1)	<b>71%</b>
▪ Make recommendations for funding sources	3	4	1	<b>8</b>
▪ Write letters on client's behalf	1	0	0	<b>1</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

GJGNY is a program administered by NYSERDA that provides financial assistance, among other services, to owners of existing multifamily and other types of buildings in the State. Slightly more than half of the Partners (55%) reported being aware of GJGNY; of those, slightly less than half (44%) said they had interacted with the program (Table 5-11).

**Table 5-11. Partners' Awareness and Use of GJGNY Financing, by Partner Type<sup>a</sup>**

Aware / Use of GJGNY	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Aware of GJGNY	53% (8/15)	55% (6/11)	67% (2/3)	<b>55%</b>
Used GJGNY	50% (4/8)	50% (3/6)	0% (0/2)	<b>44%</b>
Reasons for not using GJGNY:				
▪ Confusion regarding qualification criteria and process for applying	4	3	1	<b>8</b>
▪ Clients did not qualify	2	1	0	<b>3</b>
▪ Substantial delays and disorganization in program	1	0	0	<b>1</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

Partners who were aware of but had not used GJGNY reported that not using the program was due to confusion about the qualification criteria, and application and approval processes. In addition, clients did not always qualify for the financing. One Experienced/Active Partner also reported experiencing significant

delays and disorganization in their dealings with the program, so they and their client had pursued alternative funding options.

### 5.3.1.4 Prescriptive and Fast Track Path Processes

Depending on the building characteristics and client needs, Partners and their clients can choose the Prescriptive path or Performance path for new construction projects, and the Fast Track path or Standard path for existing buildings projects. The Prescriptive path incents prescribed energy-saving options, while the Performance path incents more customizable, whole-building modeling approaches. Prescriptive path projects receive incentive payments more quickly than do Performance path projects. Four of six Experienced/Active Partners reported offering the Prescriptive path to new construction clients (Table 5-12); these Partners are statewide or downstate-only, and large- or medium-volume Partners. These Partners also offered the Prescriptive path most often to owners of high-rise buildings and other projects that required a high-level of detailed modeling. All four of these Partners also reported that the Prescriptive path worked well overall. One Partner suggested an improvement to the Prescriptive path: higher incentive levels, similar to those provided in the Performance path. According to the Partner, this would attract more clients who choose the latter for higher incentives, but whose building would benefit from the Prescriptive path.

**Table 5-12. Partner’s Use and Evaluation of the Prescriptive Path for New Construction Projects, by Partner Type<sup>a</sup>**

Use / Evaluation	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Offered Prescriptive Path to new construction clients	67% (4/6)	0% (0/5)	0% (0/1)	<b>67%</b>
Worked well	100% (4/4)	Not asked	Not asked	<b>100%</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

The Fast Track path was designed to offer alternatives to the Standard path for existing buildings with between five and 49 units: a more streamlined application and approval process, and quicker incentive payments. Four of 11 Experienced/Active Partners who were statewide or downstate-only and small- or medium-building Partners, reported offering the Fast Track path to clients with qualified existing buildings (Table 5-13). Three of the four Partners reported that the Fast Track path worked well overall. In particular, they said the Fast Track path required less documentation and was more streamlined than the Standard path, and that these program elements allowed them to charge lower fees. However, two Partners suggested changing the name “Fast Track,” since the path was not necessarily faster than the Standard path. In addition, one Partner reported that the streamlined structure of the Fast Track path can prohibit Partners from offering a more comprehensive package of energy-efficient recommendations in buildings that could

benefit from them. This Partner suggested that the Fast Track path might be more useful to Partners with less experience in modeling.

**Table 5-13. Partner’s Use and Evaluation of the Fast Track Path for Existing Building Projects, by Partner Type<sup>a</sup>**

Use / Evaluation	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Offered Fast Track path for existing building clients	36% (4/11)	0% (0/6)	0% (0/2)	<b>36%</b>
Fast Tracked worked well	75% (3/4)	Not asked	Not asked	<b>75%</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

### 5.3.1.5 Scoping Session and ERP

In a “scoping session,” the Partner, client(s), and an MPP Project Manager meet at the project site to discuss MPP and the building, and to answer any questions before they review the Energy Reduction Plan (ERP). None of the Partners reported issues with the scoping session and the majority (92%) found it to be a very helpful step in the MPP process.

The ERP specifies what will be done to reduce the building’s energy usage, including the projected percent of energy savings and costs for each of the proposed measures. For new construction projects, the ERP is created from the results of an energy model (except for Prescriptive path projects), and for existing buildings, the ERP is created from the results of benchmarking (except for Fast Track path projects). About half of Experienced/Active and Experienced/Inactive Partners (55%) who were Partners before 2010 reported that the time it took to get an ERP approved decreased noticeably during both versions 4 and 5 of the program.

Partners said that the most common issue they had with the ERP was the amount of time it took to receive approval from NYSERDA (for existing buildings) or TRC (for new construction). Partners reported that approval times could range from two weeks to several months (Table 5-14); Inexperienced/Active Partners, and small-building Partners reported the lowest average approval time.

Partners reported that the most common causes of long approval times were errors in the ERP reports submitted by Partners, and uncertain expectations as to what to include or not include, which often required many revisions involving coordination between the Partner and NYSERDA or TRC, and between the Partner and client.

**Table 5-14. ERP Approval Time, by Partner Type<sup>a</sup>**

Service	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
ERP Approval Time	Two weeks to one year	Two weeks to several months	Two weeks to two months	<b>N/A</b>
Percent of Partners in which ERP approval is longer than one month on average	72% 13/18)	36% (4/11)	33% (2/3)	<b>59%</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

Half of Experienced/Active and Experienced/Inactive Partners also suggested that the benchmarking and modeling tools used to perform the ERP had improved during versions 4 and 5 of the program. Two Experienced/Active Partners reported that the spreadsheets in the tools worked very well, and one Experienced/Active Partner said the benchmarking table of results presented to clients was very useful.

However, about two-thirds of Partners (64%) reported several issues with the benchmarking and modeling tools and processes. First, about half of the Partners (55%) suggested that the tools recommended by NYSERDA to do MPP benchmarks and energy modeling (TREAT and Equest) were overly complicated, not user-friendly, and required steep learning curves to use correctly. Inexperienced/Active Partners particularly noted having issues with the benchmarking spreadsheet, and Experienced/Active and Experienced/Inactive Partners reported that both modeling tools required too many inputs to work correctly and required inputs that were not widely recognized or used in the energy efficiency sector. One Experienced/Active Partner said the formats of the benchmark spreadsheet and energy modeling tool made it difficult to change parts of the benchmark or model without drastically changing the results of the whole, which also often resulted in Partners making errors. Another Experienced/Active Partner suggested that making the benchmarking spreadsheets and energy modeling tools and results more comparable would be helpful for the employees involved in conducting these activities.

Second, some Partners (43%) also commented that the process of obtaining approval from NYSERDA or TRC for the benchmarking and modeling results can be burdensome. A common theme from Partners is that it takes too long to submit and get feedback from NYSERDA or TRC on the results from their benchmarking or energy modeling. Some Experienced/Active Partners mentioned that program staffs' feedback on the benchmarking or modeling report can also vary greatly across staff. Comments ranged from "too many questions and comments" to "too few questions and comments," depending on staff experience and report complexity. One Experienced/Active Partner reported that some clients considered provision of the benchmarking and modeling results to be extra paperwork more than an opportunity to find ways to save energy. This Partner added that, due to that perception, clients were not as invested in the report, which caused the Partner to spend more time explaining its importance. However, the Partner also

suggested that the additional explanations they provide for conducting the benchmark or energy model typically convinced clients of its importance as a method to identify energy savings.

Third, a few Partners (36%) noted that the process of collecting the data to perform the benchmarking and the timing of benchmarking in the project schedule sometimes was very challenging. For example, both Experienced/Active and Inexperienced/Active Partners suggested that it often can be difficult and time-consuming to access tenant spaces in existing buildings to conduct benchmarking. Partly because of the challenges with accessing tenant spaces, one Experienced/Active Partner suggested that the timing of benchmarking for existing buildings was not optimal because it often caused unnecessary delays in the project timeline; the Partner recommended doing the benchmarking earlier in the process to have more time to address these challenges without causing delays. In addition, two Experienced/Active Partners reported that the time needed to obtain data from utilities and the amount of documentation this required can be burdensome and time-consuming for existing building projects.

Overall, Partners suggested that these three main issues – problems with tools, burdens associated with the approval of results, and challenges involved with performing benchmarking and modeling – often caused them to either lose money or charge higher fees for these activities, particularly on larger-building projects.

### 5.3.1.6 Approval of Measures

More than half of the Partners did not mention any issues related to the approval of measures in an ERP to meet energy savings goals (71%), pass the TRC cost-effectiveness test (55%), or achieve approval of the ERP (64%). Some Partners did comment on their experiences with each of these aspects (Table 5-15). First, 82% of Partners reported an experience in which the ERP reviewer questioned measures or estimates in the ERP. To address these questions sufficiently, the majority of Partners had to provide more information and details in the ERP, or slightly modify the ERP. One Experienced/Active Partner also said they “bury questionable estimates within lots of data in the report to avoid questions.” Another Experienced/Active Partner reported that they sometimes “bypass TRC and go through NYSERDA” when TRC asks difficult questions.

**Table 5-15. Experience with Approval of Measures Processes, by Partner Type<sup>a</sup>**

Experience	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
ERP reviewer questioned measures or estimates	80% (8/10)	100% (5/5)	50% (1/2)	<b>82%</b>
Had measures that did not meet energy savings goals	60% (3/5)	86% (6/7)	33.3% (1/3)	<b>67%</b>
TRC cost-effective test negatively affected projects	46% (6/13)	44% (4/9)	50% (1/2)	<b>46%</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

Second, two-thirds of Partners have had measures in an ERP that did not meet energy savings goals (Table 5-15). The majority of Partners said they removed these measures from the ERP, but one Experienced/Inactive Partner combined measures to get them approved and another Experienced/Inactive Partner reported leaving the final decision up to the client. One Experienced/Active and one Experienced/Inactive Partner also suggested that removing measures from the ERP can have greater savings impacts in larger buildings than in smaller buildings, so they sometimes tried harder to find a substitute measure in larger buildings.

Third, slightly less than half of Partners (46%) reported that they had had measures that failed the TRC cost-effectiveness test and that this failure negatively affected their project(s) (Table 5-15). Partners mentioned that they often had to remove the measure from the ERP, sometimes against their client's wishes. One Experienced/Active Partner reported having to abandon a project because too many measures the client wanted in the building failed the TRC test. Two Experienced/Active Partners also suggested that they sometimes searched for more cost-effective measures and one Experienced/Inactive Partner mentioned that they tried to bundle measures to improve cost-effectiveness. Inexperienced/Active Partners reported taking extra time and effort to prepare cost estimates before submitting them to TRC to avoid any issues.

### 5.3.1.7 Reporting, Testing, Verification, and Inspections

Partners next reported on their involvement in reporting to the program and conducting testing, verification, and inspections after receiving the ERP approval. More than two-thirds of all Partners who said they had been involved in these processes did not mention having any issues with them.

Experienced/Active and Experienced/Inactive Partners reported that, after completing the ERP process, they provided inspection reports for 50%, 100%, and post-100% inspections, and payback reports to the program. Inexperienced/Active Partners said they sent quarterly updates and additional financing documents to the program after the ERP process, but none of these Partners had completed a project prior to the survey. One Experienced/Active Partner suggested that creating new reports to reflect a change to the project can be very time-consuming, and recommended allowing Partners to amend existing reports when only minor changes are necessary.

All of the four Experienced/Active Partners and one of the three Experienced/Inactive Partners also reported doing testing, verification, and inspections after the ERP approval in the project timeline; two of three Experienced/Inactive Partners and three of three Inexperienced/Active Partners reported that they had not performed these activities. The Partners that did report doing these activities mentioned performing inspections at 50% and 100% to verify that the proper equipment was installed correctly, conducting efficiency tests after installation to verify savings and test fuel usage, and analyzing utility bills for the post-100% performance payment, if applicable.



Some Partners also reported on issues they experienced during this stage of the MPP process. For example, one Experienced/Active Partner suggested that doing the quality control and quality assurance inspections separately, as MPP currently requires, necessitates multiple, time-consuming trips to the project site, and recommended that combining the processes could save time and reduce the burdens on clients and Partners. Another Experienced/Active Partner said the program required too many photos documenting the inspection process and suggested using more text- or numbers-based documentation. A third Experienced/Active Partner also said they would prefer to use printed inspection forms they can complete onsite, rather than the digital spreadsheet forms they cannot take to the project site. Two Experienced/Inactive Partners recommended sending NYSERDA staff to the project site earlier in the process rather than at the very end, or doing periodic inspections to identify problems earlier and/or prevent problems from occurring.

### 5.3.2 Communication and Training Processes

Partners reported their experiences with communication and training processes, which include communications with TRC and NYSERDA, using the Partner Portal, attending webinars and conferences, and receiving training through NYSERDA.

#### 5.3.2.1 Communications with TRC and NYSERDA

Most of the Partners (92%) reported contacting NYSERDA staff with questions or general concerns related to existing building projects (Table 5-16). Of these, 73% reported that NYSERDA was easy to contact. Among those who reported that NYSERDA was not easy to contact, the most common reason they gave was that it could be difficult to find experienced staff with whom to speak or to be assigned an experienced staff person. One of these Partners stated that finding experienced staff had been improving in version 5 of MPP.

Partners reported contacting NYSERDA for a number of reasons (Table 5-16). The most common was to discuss energy-efficient measures or how to get 15% energy savings for a project. Other reasons for contacting NYSERDA include: obtaining information on incentive levels and funding opportunities; discussing changes to or issues with benchmarking software; resolving issues with program processes; responding to comments on applications; and learning more about the program and how to drive demand for the program more effectively.

**Table 5-16. Partner Communications with NYSERDA Regarding Existing Buildings, by Partner Type<sup>a</sup>**

Communication	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Contacted NYSERDA with questions or concerns (Existing Buildings)	92% (12/13)	88% (7/8)	100% (3/3)	<b>92%</b>
NYSERDA easy to contact	67% (8/12)	86% (6/7)	67% (2/3)	<b>73%</b>
Reasons for contacting NYSERDA:				
▪ Discuss EE measures and how to make EE work for a project	4	2	1	<b>7</b>
▪ Obtain information on incentives and funding sources	2	3	1	<b>6</b>
▪ Discuss changes to or issues with benchmarking software	2	1	1	<b>4</b>
▪ Resolve issues with program processes	1	2	1	<b>4</b>
▪ Respond to comments on applications	1	2	0	<b>3</b>
▪ Learn more about the program and how to drive demand more effectively	0	1	1	<b>2</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

Most of the Partners (91%) also reported contacting TRC with questions or concerns in general or specifically related to new construction projects (Table 5-17). Of these, 100% stated that contacting TRC is easy, but one Experienced/Active Partner suggested it can be difficult sometimes to reach a reviewer to get answers. Partners reported contacting TRC to discuss percent savings and ERP issues, the documentation required for different program processes, clarifications on program rules, and program qualifications for clients.

**Table 5-17. Partner Communications with TRC Regarding New Construction Projects, by Partner Type<sup>a</sup>**

Communication	Experienced Partners		Total
	Active	Inactive	
Contacted TRC with questions or concerns (New Construction)	100% (8/8)	67% (2/3)	<b>91%</b>
TRC easy to contact	100% (6/6)	100% (2/2)	<b>100%</b>
Reasons for contacting TRC:			
▪ Discuss percent savings and ERP issues	3	2	<b>5</b>
▪ Determine what documentation is required for different processes	2	1	<b>3</b>
▪ Clarify program rules or protocols	2	1	<b>3</b>
▪ Discuss program qualifications for clients	2	0	<b>2</b>

<sup>a</sup> Inexperienced/Active, Inexperienced/Inactive, and Permanently Removed Partners were not asked these questions.

### 5.3.2.2 Partner Portal, Webinars, and Conferences

The Partner Portal is a password-protected NYSERDA website that provides Partners access to program information, guidelines, and templates; project application submissions to MPP staff; case studies and training materials; links to information from TRC and BPI; links to software tools; and, marketing documents and activities. A majority of Partners (83%) said they used the Partner Portal at least once after they became a Partner (Table 5-18). These Partners were reporting on their experience with an older version of the Partner Portal instead of the version that was launched in late 2013. Partners mentioned using the Partner Portal primarily to retrieve documents, forms, templates, and tools, as well as to obtain information, technical tips, and program guidelines. Experienced/Active and Experienced/Inactive Partners also used the Portal to update their company information, upload reports, and obtain marketing materials. Two Partners indicated that NYSERDA should update the design of the Partner Portal because the site was hard to navigate. Another Partner said they were unable to save incomplete documents on the Portal to return to complete later, so they had to make several attempts to submit complete information.

**Table 5-18. Partner Experience with Partner Portal, Webinars, and Conferences, by Partner Type<sup>a</sup>**

Experience	Experienced Partners		Inexperienced Partners		Total
	Active	Inactive	Active	Inactive	
Used Partner Portal	88% (14/16)	82% (9/11)	33% (1/3)	75% (9/12)	<b>83%</b>
Attended NYSERDA webinar	75% (12/16)	64% (7/11)	67% (2/3)	75% (9/12)	<b>75%</b>
Webinars useful	58% (7/12)	100% (7/7)	100% (2/2)	Not asked	<b>76%</b>
Attended NYSERDA Partner conference	69% (11/16)	27% (3/11)	33% (1/3)	67% (8/12)	<b>58%</b>
Conference useful	56% (9/16)	100% (3/3)	100% (1/1)	Not asked	<b>65%</b>

<sup>a</sup> Permanently Removed Partners were not asked these questions.

Three-fourths of Partners said they attended at least one NYSERDA webinar after becoming a Partner (Table 5-18). Of these, about three-fourths (76%) found the webinar(s) useful. The most common reason Partners mentioned for attending the webinars was to receive program updates, particularly about funding. Two Partners also noted that they use the webinars to train their staff. Partners also identified some issues with the webinars. These included the inability to study webinar materials before the webinar began, too little time to ask questions at the end of the webinar, and the absence of an archive of past webinars. In addition, Partners recommended adding more topics on technical issues, project funding, TRC processes, and administrative components like completing paperwork correctly and efficiently.

Over half of Partners (58%) reported attending at least one NYSERDA Partner conference after becoming a Partner (Table 5-18); slightly more were statewide and downstate-only Partners, and high-volume Partners who said they had attended a Partner conference. Of these, about two-thirds (65%) mentioned that the conference was useful. Partners attended the conferences primarily to meet and network with program staff, competitors, and clients. Other reasons included receiving program updates, providing feedback to program staff, attending training seminars, and receiving an annual recap of program activities. Those who did not find the conference useful recommended: adding more vendors; providing more training seminars, particularly on complex energy efficiency topics like creating an ERP; including more topics on business development; and extending the conference by one or two days to accommodate additional conference activities and to provide a little more time between existing activities at the conferences.

### 5.3.2.3 Other Training Opportunities

A majority of Partners (66%) would like NYSERDA to offer additional training opportunities. This is particularly the case for Inexperienced/Active Partners (Table 5-19) and low-volume Partners. These additional training topics include (from most requested to least requested): creating an ERP; conducting

benchmarking and modeling in general, and using NYSERDA's software tools in particular; auditing; budgeting for projects; types of incented measures and their applications in buildings; BPI certification; field training of new employees in Partner firms; and a "refresher" orientation course for Partners who have been in the program for a long time.

**Table 5-19. Additional Partner Training Preferences, by Partner Type<sup>a</sup>**

Service	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Preferred additional training from NYSERDA	53% (8/15)	73% (8/11)	100% (3/3)	<b>66%</b>
Training Topics:				
▪ Creating an ERP	2	1	1	<b>4</b>
▪ Conducting benchmarking and modeling; learning to use tools	2	1	1	<b>4</b>
▪ Budgeting for projects	2	1	0	<b>3</b>
▪ Different types of incented EE measures and their applications	0	1	1	<b>2</b>
▪ BPI certification	0	1	0	<b>1</b>
▪ Field training of new employees	0	0	1	<b>1</b>
▪ "Refresher" orientation course for Partners who have been in the program a long time	1	0	0	<b>1</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

### 5.3.3 Marketing

Overall, Partners reported that, on average, about half or more of their MPP projects were initiated by the Partner rather than the client (Table 5-20). This is particularly true for the three Inexperienced/Active Partners, which initiated 100% of their projects, and for upstate-only Partners. These numbers indicate that Partners, on average, more often reached out to clients that likely were qualified to participate in MPP, rather than waiting for clients to approach them with potential projects.

**Table 5-20. Partner Marketing Activities, by Partner Type<sup>a</sup>**

Activity	Experienced Partners		Inexperienced Partners		Total
	Active	Inactive	Active	Inactive	
Average percentage of projects initiated by Partner	65%	46%	100%	Not asked	<b>61%</b>
Partners currently marketing MPP services	50% (8/16)	55% (6/11)	0% (0/3)	67% (8/12)	<b>56%</b>
Partners advertising their MPP status	63% (5/8)	83% (5/6)	N/A	Not asked	<b>71%</b>
Partners using NYSERDA materials in marketing activities	30% (3/10)	50% (3/6)	N/A	Not asked	<b>38%</b>

<sup>a</sup> Permanently Removed Partners were not asked these questions.

About half of Partners reported marketing their MPP services, although there were differences across Partner types (Table 5-20). For example, more high- and medium-volume Partners marketed their MPP services than did the low-volume Partners. Of those who reported marketing their MPP services, a majority of Experienced/Active (63%) and Experienced/Inactive (55%) Partners also advertised their status as a Partner. In addition, about one-third of Experienced/Active Partners (30%) and half of Experienced/Inactive Partners (50%) reported using materials provided by NYSERDA in their marketing activities.

Two-thirds of Partners (67%) who used NYSERDA's materials in their marketing activities found NYSERDA's materials to be helpful (Table 5-20), and five of the six Partners offered recommendations for how NYSERDA could help Partners with their marketing. The most common recommendation was to keep the NYSERDA website current, particularly the part of the website that displays Partner information. For example, three Partners found that some of the information on NYSERDA's website and the Partner information website was not up to date.

Another recommendation from multiple Partners was for NYSERDA to host more industry events as part of a marketing strategy to enable Partners to connect more easily with potential clients. One Inexperienced/Active Partner who did not market their firm's services, but was preparing to do so, said that NYSERDA tries to include too much detail in its marketing materials and suggested simplifying the message for broader appeal. According to this Partner, NYSERDA's MPP marketing materials made the program seem too complicated. This Partner further suggested that NYSERDA provide a clear delineation of the incentives offered for different project and building types because this information was not readily available or current. An Experienced/Active Partner recommended that NYSERDA allow Partners to use NYSERDA's logo in their marketing materials to add more legitimacy to their company and their marketing activities. An Experienced/Inactive Partner suggested that NYSERDA could more aggressively market directly to property management companies in New York to attract more participants to the program.

## 5.4 Market Effects Baseline

To assess what effects MPP had on the market for multifamily energy efficiency services, the PE/MCA team asked Partners about their previous experience in the multifamily sector before becoming a Partner, their past business growth and assessment of the current market, what MPP-incented services they offered in the market, spillover and free ridership in the market, and what services and activities they attributed to their involvement in MPP.

### 5.4.1 Previous Involvement in the Multifamily Sector

About three-fourths of the combined Experienced/Active, Experienced/Inactive, and Inexperienced/Active Partners (74%) reported being involved in the multifamily sector before becoming a Partner, although substantially fewer of the Experienced/Inactive Partners made this statement (Table 5-21). These Partners also described their involvement in the multifamily sector before becoming a Partner. Partners who were involved in the multifamily sector before becoming a Partner reported that, on average, their multifamily work accounted for about half of their overall business. This is slightly higher for downstate-only Partners compared to statewide or upstate-only Partners, and it is notable that Experienced/Inactive Partners reported that, on average, 83% of their business before becoming a Partner was in the multifamily sector and that they were inactive in the program at the time of the interview. Partners also reported that slightly less than one-third of their multifamily business, on average, was supported by utility or government programs. This was substantially lower for Inexperienced/Active Partners than for other Partner types and for upstate-only Partners compared to statewide or downstate-only Partners.

A large majority of Partners (88%) reported that the energy efficiency services they offered before becoming a Partner were similar to the services they offered as a Partner (Table 5-21). The PE/MCA team also found this to be the case more for downstate-only and statewide Partners than for upstate-only Partners. Eighteen percent of Experienced/Active Partners said they provided different services after they became a Partner. These changes included: making their services more comprehensive (2); providing modeling and benchmarking (1); and providing weatherization services (1).

Similarly, 88% of Partners reported that they provided the equivalent of MPP's ERP to multifamily building contacts before they became a Partner (Table 5-21). More downstate-only and statewide Partners offered an ERP than did upstate-only Partners. Of the Partners providing an ERP, 18% of Experienced/Active Partners reported that their ERP sometimes was connected to LEED projects. Moreover, the majority of all Partners providing an ERP included detailed cost estimates in their ERP (89%) and always recommended MPP-incented measures to their pre-Partner multifamily projects (68%).

**Table 5-21. Involvement in Multifamily Sector before becoming a Partner, by Partner Type<sup>a</sup>**

Involvement	Experienced Partners		Inexperienced Partners	Total (% of Sample)
	Active	Inactive	Active	
Provided EE services to MF	85% (17/20)	55% (6/11)	67% (2/3)	<b>74%</b>
Average percent of business in MF	41%	83%	50%	<b>51%</b>
Average percent of MF business supported by utility or government programs	38%	27%	20%	<b>29%</b>
EE services similar to services offered as a Partner	82% (14/17)	100% (6/6)	100% (2/2)	<b>88% (65%)</b>
Provided equivalent of MPP's ERP	71% (14/17)	100% (6/6)	100% (2/2)	<b>88% (65%)</b>
ERP connected to LEED projects	18% (3/17)	0% (0/6)	0% (0/2)	<b>12%</b>
ERP Included detailed cost and savings estimates	91% (10/11)	100% (6/6)	50% (1/2)	<b>89% (50%)</b>
Always recommended MPP-incented measures	55% (6/11)	83% (5/6)	100% (2/2)	<b>68% (38%)</b>
New construction projects that saved 15% above ASHRAE	0% (0/5)	0% (0/2)	100% (2/2)	<b>22% (6%)</b>
Existing building projects that saved 15% over current use	29% (4/14)	33% (2/6)	100% (2/2)	<b>36% (24%)</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

Partners also reported the percent of their new construction and existing buildings projects that obtained 15% savings before they became a Partner (Table 5-21). Two of two Inexperienced/Active Partners and none of the Experienced/Active and Experienced/Inactive Partners said they achieved 15% savings above ASHRAE standards for their new construction projects. Two of two Inexperienced/Active, four of 14 Experienced/Active, and two of six Experienced/Inactive Partners reported achieving 15% savings over the then-current energy use for their existing buildings projects.

### 5.4.2 Past Business Growth

About two-thirds of Partners (66%) indicated that they received more inquiries from multifamily clients after becoming a Partner (Table 5-22). About one-fourth of Partners (23%) suggested that inquiries from multifamily clients increased in 2013 while a 41% reported no change in inquiries, and about one-third (36%) reported a decrease in inquiries despite a small increase in multifamily new constructions and renovations in 2013. More upstate-only Partners and high-volume Partners reported a decrease in inquiries from clients in 2013 compared to downstate-only and statewide Partners, and low-volume Partners, respectively.



More than half of Partners (57%) reported that their service territory for multifamily projects expanded over the past five years, although this was substantially lower for Inexperienced/Active Partners (Table 5-22) and downstate-only Partners. Partners whose service territory did not expand in the past five years said that going outside their current service territory was too far to travel in terms of cost and time, they wanted to remain “local,” or they had enough work in their current service territory. One upstate Experienced/Active Partner specifically mentioned not having enough employees to expand beyond their current territory.

**Table 5-22. Partners’ Past Business Growth, by Partner Type<sup>a</sup>**

Characteristic	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Inquiries				
Increase in inquiries from MF clients since becoming Partner	60% (9/15)	73% (8/11)	67% (2/3)	66%
Change in inquiries from MF clients in 2013:				
▪ Increased	11% (1/9)	30% (3/10)	33% (1/3)	23%
▪ No change	33% (3/9)	60% (6/10)	0% (0/3)	41%
▪ Decreased	56% (5/9)	10% (1/10)	67% (2/3)	36%
Expansion				
Service territory expanded in past five years	63% (10/16)	55% (6/11)	33% (1/3)	57%
Reasons service territory not expanded:				
▪ Too far to travel in terms of cost and time	2	3	1	6
▪ Enough work in current service territory	2	1	1	4
▪ Want to remain “local”	1	1	0	2
▪ Not enough employees to expand	1	0	0	1
Growth				
Employees in MF have grown in past 5 years	47% (7/15)	36% (4/11)	0% (0/3)	38%
Reasons for growth in MF employees:				
▪ Increased workloads	4	2	N/A	6
▪ Changes in regulatory requirements, like Local Laws, created more work	3	1	N/A	4
▪ American Recovery and Reinvestment Act (ARRA) funding	1	0	N/A	1
▪ Increased awareness in the market of EE benefits	0	1	N/A	1

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

Similarly, over one-third of Partners (38%) reported that the number of their employees involved in multifamily projects had grown over the past five years (Table 5-22); this was higher for statewide Partners and high-volume Partners. According to Partners, this was due in part to increased workloads, changes in regulatory requirements like Local Laws that created more work, American Recovery and Reinvestment Act (ARRA) funding, and increased awareness of energy efficiency benefits in the market. As discussed in more detail Section 5.4.5 below, MPP also had some impact on the growth in the number of employees in Partner firms.

### 5.4.3 Assessment of Current Market

Partners reported the types of clients who are the most and least attracted to energy efficiency in the current multifamily housing market in New York State. The clients most attracted included those involved in: affordable housing, Class-A<sup>51</sup> office buildings, cooperatives and condominiums, commercial and industrial buildings, municipal and institutional buildings (educational facilities, hospitals, and government offices), churches, and developers and property managers. Partners said the clients least receptive to energy efficiency were affordable housing in which tenants pay utilities, smaller multifamily buildings, manufacturing, and retail.

Partners mentioned two primary aspects of MPP that attracted clients: incentives and access to financing. Experienced/Inactive Partners also said that potential clients were attracted by opportunities to save money and energy, comply with Local Laws, and meet immediate needs, such as replacing a malfunctioning boiler or upgrading a building after it incurred damage from a natural disaster.

Partners reported the level of client awareness of MPP, from low to high on a five-point scale, in which “1” was “low” and “5” was “high.” On average, slightly less than three-fourths of Partners (72%) indicated that their multifamily clients had a low level of awareness (Table 5-23). Upstate-only Partners and small-building Partners reported lower levels of client awareness, on average. However, half of all Partners (50%) offered that client awareness was increasing.

**Table 5-23. Partners Reporting Low Level of Awareness among the Majority of Clients, by Partner Type<sup>a</sup>**

Awareness	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Most clients had low awareness of MPP	73% (11/15)	64% (7/11)	100% (3/3)	72%
Awareness increasing	55% (6/11)	43% (3/7)	67% (2/3)	50%

<sup>51</sup> Class-A office buildings are the most prestigious buildings competing for premier office users, with rents above average for the area. Buildings have high quality standard finishes, state of the art systems, exceptional accessibility and a definite market presence.

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

#### 5.4.4 Spillover and Free Ridership

Although the Impact team provides most of the spillover and free ridership analyses, the PE/MCA team did ask Partners some questions related to these topics. The PE/MCA team findings are described below.

Slightly under three-fourths of Partners (72%) reported providing energy efficiency services to non-multifamily clients, and about two-thirds of Partners (69%) reported providing energy efficiency services to non-MPP multifamily clients after becoming a Partner (Table 5-24). This is slightly lower for downstate-only Partners than for statewide and upstate-only Partners. The types of non-MPP multifamily clients Partners mentioned included: owners of buildings too small for MPP (fewer than 5 units); clients seeking to comply with Local Laws; condominiums and cooperatives; owners of buildings in which 15% savings could not be achieved; clients with cogeneration, solar systems, steam systems, or oil-fired heating; and student housing clients. Partners were not asked about the types of non-multifamily clients to which they provided energy efficiency services.

Overall, 80% of the Partners providing energy efficiency services to non-MPP multifamily clients reported providing ERP-type services (Table 5-24); this was lower for upstate-only Partners and small-building Partners. A large majority of all Partners (94%) reported that they used a modified version of NYSERDA's ERP instead of NYSERDA's ERP for their non-MPP multifamily clients. The most common modification Partners reported was providing a shorter and simpler ERP report, often by not including the tables in NYSERDA's ERP report. Other modifications Partners mentioned included accounting for carbon outputs in the ERP, analyzing cost-effectiveness in terms of cash flow and payback period, providing fewer energy-efficient scenarios, not collecting or including as much detail about measures, and relying less on computer-based modeling. One Partner stated, "We design our [modified] ERP for the building, not the reviewer, as NYSERDA does."

More than three-fourths of the Partners (80%) providing an ERP reported that when they used the modified ERP, they got the same results in regard to their non-MPP clients' understanding and actions taken as those they achieved when they used NYSERDA's ERP for their MPP clients (Table 5-24). Of those Partners who did not get the same results from clients, the reasons included: clients had trouble understanding any ERP (1); market-rate clients did want not an ERP performed unless it was incented (1); and NYSERDA's ERP had more credibility due the "NYSERDA sponsorship or brand" (1).

**Table 5-24. Spillover of Partner MPP Services, by Partner Type<sup>a</sup>**

Characteristic	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Provide EE services to non-MF clients	87% (13/15)	55% (6/11)	67% (2/3)	<b>72%</b>
Provide EE services to non-MPP MF projects	73% (11/15)	55% (6/11)	100% (3/3)	<b>69%</b>
Types of non-MPP MF clients:				
▪ Owners of buildings too small for MPP	3	2	1	<b>6</b>
▪ Clients looking to comply with Local Laws	2	2	1	<b>5</b>
▪ Condominiums and cooperatives	2	1	0	<b>3</b>
▪ Owners of buildings in which 15% savings cannot be achieved	1	1	0	<b>2</b>
▪ Clients with oil-fired heating	1	1	0	<b>2</b>
▪ Clients with cogeneration	1	0	0	<b>1</b>
▪ Clients with solar systems	0	1	0	<b>1</b>
▪ Clients with steam systems	1	0	0	<b>1</b>
▪ Student housing clients	1	0	0	<b>1</b>
ERP provided to non-MPP clients	82% (9/11)	67% (4/6)	100% (3/3)	<b>80%</b>
Percent using a modified-ERP (vs. NYSEDA's ERP)	89% (8/9)	100% (4/4)	100% (3/3)	<b>94%</b>
Modifications made to ERP:				
▪ Shorter and simpler report	6	4	2	<b>12</b>
▪ Fewer EE scenarios	2	2	0	<b>4</b>
▪ Less data collection and details on EE measures	1	1	1	<b>3</b>
▪ Other	2	1	0	<b>3</b>
Same results from owners when using modified-ERP	63% (5/8)	100% (4/4)	100% (3/3)	<b>80%</b>
Recommend MPP-incented measures in majority of sales situations	100% (11/11)	83% (5/6)	33% (1/3)	<b>85%</b>
Work in areas where MPP is not offered	46% (6/13)	33% (2/6)	0% (0/3)	<b>36%</b>
Recommend MPP-incented measures in these areas most of the time	67% (4/6)	100% (2/2)	N/A	<b>75%</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

Overall, 85% of Partners reported recommending measures with the same energy saving specifications as those incented by MPP (“MPP-like measures”) in the majority of their non-MPP projects (Table 5-24), although this was slightly lower for upstate-only Partners than for statewide and downstate-only Partners. About one-third of Partners (36%) worked in areas where MPP was unavailable (outside the State); the incidence of this was slightly higher for Experienced/Active Partners, and downstate-only and statewide Partners. Of the Partners working in areas where MPP was not offered, three-fourths indicated that they recommended MPP-like measures most of the time in these areas.

As shown in Table 5-25, nine Partners (26%) reported not providing energy efficiency or ERP-like services before becoming a Partner. These Partners accounted for 133 MPP projects (16%). Three Partners (9%) reported providing energy efficiency services, but not ERP-like services; these Partners accounted for 86 MPP projects (11%). The majority of Partners (65%, or 22 of 34) reported providing both energy efficiency and ERP-like services before becoming a Partner; these Partners accounted for 589 MPP projects (73%). Seventeen of these Partners also reported that their ERP-like services were comprehensive, including both cost and savings estimates.

**Table 5-25. Number of Partners and Projects by Level of Energy Efficiency Services Provided in the Multifamily Sector before becoming a Partner**

Source: CRIS database, 12/20/2013

Service Provided	Partners (%)	Projects Since Becoming a Partner (%)
Provided no ERP-like services or other energy efficiency services before becoming a Partner	9 (26%)	133 (16%)
Provided <i>basic</i> ERP-like services but provided no other energy efficiency services before becoming a Partner	3 (9%)	86 (11%)
Provided <i>basic</i> ERP-like services and other energy efficiency services before becoming a Partner	5 (15%)	185 (23%)
Provided <i>comprehensive</i> ERP-like services that included detailed cost and savings estimates, and provided other energy efficiency services before becoming a Partner	17 (50%)	404 (50%)

A majority of Partners said that if MPP were unavailable in New York State they still would provide MPP-like services to multifamily clients (Table 5-26). About three-fourths (74%) indicated that they would provide an ERP and 86% stated that they would recommend MPP-like measures. This was slightly lower for upstate-only Partners compared to downstate-only and statewide Partners.

**Table 5-26. Partner Free Ridership, by Partner Type<sup>a</sup>**

Service	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Provide ERP for majority of projects if MPP were unavailable	70% (7/10)	83% (5/6)	67% (2/3)	<b>74%</b>
Recommend MPP-incented measures for majority of projects if MPP were unavailable	85% (11/13)	100% (6/6)	67% (2/3)	<b>86%</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

### 5.4.5 MPP Attribution

Slightly over three-fourths of Partners (76%) reported providing energy efficiency services to non-MPP clients over and above the services they provided before becoming a Partner (Table 5-27). This was higher for upstate-only Partners and small-building Partners. The “additional” services Partners provided included: installing and/or servicing boilers, chillers, insulation, lighting, water-heating, and distribution systems; performing air sealing; doing fuel conversions and cogeneration projects; providing full-service energy consulting that included auditing, benchmarking, modeling, technology feasibility studies, and troubleshooting; providing engineering services; conducting retro-commissioning; providing construction management; and, instructing clients about energy efficiency benefits. Over half of Experienced/Active Partners (56%), but none of the Experienced/Inactive and Inexperienced/Active Partners, said they developed these services through their participation in MPP; this was slightly higher for upstate-only Partners than for statewide or downstate-only Partners.

**Table 5-27. Attribution to MPP for Energy-efficient Services and Market Demand, by Partner Type<sup>a</sup>**

Service	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Provided EE services over and above what was provided before becoming a Partner	75% (9/12)	83% (5/6)	67% (2/3)	<b>76%</b>
Services provided:				
▪ Installing and/or servicing boilers	3	1	1	<b>5</b>
▪ Benchmarking	1	1	2	<b>4</b>
▪ Modeling	1	1	2	<b>4</b>
▪ Engineering services	2	1	1	<b>4</b>
▪ Installing lighting	1	1	0	<b>2</b>
continued				

Service	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
▪ Fuel conversions and cogeneration	1	0	1	2
▪ Auditing	1	1	0	2
▪ Retro-commissioning	1	1	0	2
▪ Other	5	3	1	9
Developed EE services through MPP	56% (5/9)	0% (0/5)	0% (0/2)	31%
Status as “MPP Partner” contributed to getting non-MPP projects	57% (4/7)	80% (4/5)	50% (1/2)	64%
MPP effect on demand for non-MPP MF services in past two years:				
▪ Increased demand	50% (5/10)	20% (1/5)	33% (1/3)	39%
▪ No change in demand	40% (4/10)	60% (3/5)	67% (2/3)	50%
▪ Decreased demand	10% (1/10)	20% (1/5)	0% (0/3)	11%
MPP increasing demand from non-MF clients	0% (0/10)	17% (1/6)	0% (0/3)	5%
Growth in MF employees due to MPP	14% (1/7)	50% (2/4)	N/A	21%

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.

About two-thirds of Partners (64%) reported that their status as an “MPP Partner” contributed to their success in obtaining non-MPP projects (Table 5-27). This was higher for downstate-only Partners, high-volume Partners, and large-building Partners. In addition, 39% of Partners reported that MPP increased demand in the multifamily market for their services; half did not notice any change and a small minority (11%) reported a decrease in demand. In addition, a very small minority (5%) commented that their Partner status contributed to an increase in demand for energy-efficient services from non-multifamily clients.

Of the 38% of Partners who reported an increase in the number employees over the past five years (Table 5-28), a small minority (21%) attributed this growth to MPP (Table 5-27). This was substantially higher for Experienced/Inactive Partners than for Experienced/Active Partners, and for statewide Partners than for downstate- and upstate-only Partners.

## 5.5 Barriers to Participation

The research team identified several barriers to participation in MPP from the interviews and surveys of Partners. Partners discussed barriers to their own participation in MPP, as well as what they thought were barriers to clients’ participation in MPP.

### 5.5.1 Oil-Heated Projects and RGGI Funding

Overall, a majority of Partners (61%) reported working on non-MPP multifamily projects that involved oil heating since they became a Partner (Table 5-28). A minority of these Partners (33%) worked on a multifamily project involving oil heating that received funds through RGGI. A greater percentage of the Experienced/Active Partners, downstate-only Partners, and high- or medium-volume Partners reported working on a RGGI-funded project.

Partners who worked on oil-heated projects identified several important issues (Table 5-28) with these projects. The most common issue across all Partner types was the limited amount of funding and incentives in RGGI, including unpredictable changes in this funding over time. Partners reported that uncertainty in the funding source – how much is available in RGGI and how much could go toward their project – can be a barrier. The second most common issue reported across all Partner types was technical problems with getting gas to the building and working with conversion technologies in non-RGGI funded oil-heated projects. Partners mentioned that some buildings do not have access to gas and some that do have access still have technical limitations, such as requiring a backup boiler or underground tank. One Experienced/Inactive Partner said that decommissioning oil furnaces is a big challenge. A third common issue with oil-heated buildings across all Partner types is that the energy analyses often were more difficult to conduct than for firm gas buildings. This complexity added time and cost to oil-heated projects, and Partners would like to avoid this complexity. Given these barriers, Partners said it was very difficult to qualify oil-heated buildings for MPP. As one Experienced/Active Partner said, “Anyone not on firm gas in [New York City] is left behind, not going through MPP.”

**Table 5-28. Partner Experience with Oil-Heated Projects, by Partner Type<sup>a</sup>**

Experience	Experienced Partners		Inexperienced Partners	Total
	Active	Inactive	Active	
Worked on projects involving oil heating	68% (15/22)	45% (5/11)	67% (2/3)	<b>61%</b>
Have done RGGI-supported project	45% (10/22)	18% (2/11)	0% (0/3)	<b>33%</b>
Issues:				
▪ Limited amount of funding that changes over time	5	1	N/A	<b>6</b>
▪ Technical problems	4	1	N/A	<b>5</b>
▪ Energy analyses more difficult	2	1	N/A	<b>3</b>

<sup>a</sup> Inexperienced/Inactive and Permanently Removed Partners were not asked these questions.



### 5.5.2 Impact of the MPP Hiatus

Slightly over half of all Partners (56%, or 24 of 43) reported that the hiatus in MPP between July 2009 and September 2010 negatively affected their business. Of these, about one-third (37%) experienced significant project delays and about two-thirds (63%) lost clients and projects. Partners had to inform clients about the hiatus, which made it more difficult to retain clients and maintain their trust after the hiatus.

About half of the Partners (55%) suggested that the hiatus eroded their trust in the program and that the response has had lasting impacts, such as a reluctance to pursue MPP projects as aggressively or recommending MPP to their clients as frequently. About one-third of Partners (31%) were concerned that the program could go on hiatus again and leave their clients without funding, which would further erode the Partner's and NYSERDA's credibility. About half of Partners (48%) reported making MPP work a lower priority than their other projects as a result of the hiatus, and/or moved their firms toward other types of work.

Partners who said they were unaffected by the hiatus either were not Partners during the hiatus, did not have a project in the pipeline, or were nearly completed with a project early in the hiatus. In addition, all the Partners reported that their non-MPP business was not affected by the hiatus.

### 5.5.3 Reasons for Partner Inactivity in MPP Version 5

Of all the 105 MPP Partners in the program, 66% were not active in version 5 of the program, and 85% of Partners who were not interviewed were not active in version 5 (Table 5-29). Of the 50 Partners interviewed by the PE/MCA team, slightly less than half (44%) were not active in MPP version 5 since July 2012; this finding varies substantially by Partner type. A minority of Experienced/Active and Inexperienced/Active Partners, and a majority of Experienced/Inactive and Inexperienced/Inactive were not active in version 5 (Table 5-29).

Partners who were eligible but inactive in MPP (not Permanently Removed) since July 2012 reported multiple reasons for inactivity (Table 5-29). The most common reason mentioned was that some types of MPP projects were not profitable enough to warrant the amount of work required and the level of incentives paid. For example, one high-volume Experienced/Active Partner stated that MPP is profitable for the largest projects and the program is not designed for smaller projects. A low-volume Experienced/Inactive Partner also suggested that MPP is not profitable for small Partner firms, regardless of project size. Another Experienced/Inactive firm reported that condominiums and cooperatives comprise a large percentage of their MPP work, but are especially unprofitable because of the challenges of working with a board of multiple owners and/or stakeholders.

**Table 5-29. Inactive Partners and Reasons for Inactivity, by Partner Type**

Characteristic	Experienced Partners		Inexperienced Partners		Permanently Removed	Total
	Active	Inactive	Active	Inactive		
Total Partners inactive in MPP version 5 (since July 2012)	9 of 31 (29%)	14 of 20 (70%)	5 of 8 (63%)	23 of 28 (82%)	18 of 18 (100%)	<b>69 of 105 (66%)</b>
Percent of not interviewed Partners inactive in MPP version 5	56% (5/9)	100% (9/9)	80% (4/5)	81% (13/16)	100% (16/16)	<b>85%</b>
Percent of interviewed Partners inactive in MPP version 5	17% (4/22)	55% (5/11)	33% (1/3)	83% (10/12)	100% (2/2)	<b>44%</b>
Reasons for inactivity (interviewed Partners):						
▪ Program not profitable	3	3	1	4	1	<b>12</b>
▪ Busy with non-MPP work	3	3	0	6	1	<b>10</b>
▪ Problems with program administration and processes	1	0	1	3	0	<b>5</b>

Another reason why some Partners were not active in MPP was that they were busy with non-MPP work in other sectors or regions. Three Partners mentioned that the economic downturn and volatility in the multifamily sector pushed them into other sectors and that they were actively working in those sectors at the time of the interview. Some Partners mentioned being busy with Local Law-related projects and Hurricane Sandy projects. One Partner mentioned using other programs like EmPower more often than MPP. Another Partner mentioned that most of their firm's recent multifamily work was in other states where MPP is unavailable.

Five Partners reported problems with the program administration and processes as a reason for their inactivity. These included: issues with the implementation contractor, TRC, and the total resource cost test; the program's hiatus; high administrative costs and too many program requirements; and NYSERDA's slow response times, which prevented them from completing projects profitably and within a reasonable timeframe.

The two Permanently Removed Partners reported additional reasons for exiting the program (Table 5-30). One Partner said that MPP was "too much work and not enough benefit," and incentive levels were too low to appeal to the firm's customers. The other Partner indicated that their firm was not the ideal type to be a Partner after an internal reorganization resulted in the departure of staff with multifamily certifications; this Partner reported doing more installation-based work in sectors other than multifamily.

**Table 5-30. Reasons for Becoming Permanently Removed from MPP**

Respondent	Reasons for Permanent Removal
Permanently Removed Partner #1	Program was too much work for not enough benefit for the firm; MPP incentives were not attractive enough for firm's customers.
Permanently Removed Partner #2	Not ideal firm type to be Partner (installation firm rather than a design-build firm); internal reorganization of company away from multifamily-sector work; loss of staff with multifamily certification(s).

### 5.5.4 Other Barriers to Partner Participation

Partners identified other barriers to their participation in MPP. The most common barrier was a lack of demand for MPP in the market; this was cited more frequently by upstate-only and low-volume Partners. Some Partners said that the economic downturn and fluctuations in the multifamily market contributed to a lower demand for their services than before the economic downturn. Other Partners reported that some potential clients had a low level of awareness of energy efficiency and MPP. Partners also said that there was too much competition with other Partner firms in the large multifamily markets in New York State.

Several Partners noted a few other barriers to participation. One upstate Partner reported that they did not have enough skilled employees to work on multifamily projects. One experienced Partner mentioned that there were no more incentives for audits, and that the audits had been an important part of their process to screen potential MPP clients. Two Partners indicated it had become more difficult to participate because technical requirements had increased while incentives had decreased.

### 5.5.5 Barriers to Client Participation

Partners shared their perspectives on their clients' barriers to participation in MPP. A common theme from downstate-only and statewide Partners was that Local Laws had pushed some clients away from doing comprehensive work and toward making retro-commissioning measure improvements that did not achieve the targeted 15% savings, but did comply with the law.

Competition from other multifamily programs in the state, such as those offered by Consolidated Edison, also was identified as a barrier. For example, 12 Partners indicated that if incentives from another program covered more of the costs of the measures desired by the client, they would recommend these programs instead of MPP. One Partner mentioned that they did not specifically "push" MPP to clients who were eligible for multiple programs, but instead presented MPP and the other programs without advocating for a specific program. In addition, three Partners said that NYSERDA focuses more on its Partners than driving general demand in the market, and that NYSERDA should conduct more outreach and publicity to increase interest in a market with low levels of awareness.

Five high- and medium-volume Partners mentioned that repeat clients – those who participated in earlier versions and have other buildings that qualify for MPP – had become hesitant to participate due to the lower incentives and increased technical requirements. A minority of these Partners also said that some repeat clients were frustrated with the complexity of the program and the time required to participate.

Two other Partners reported that some new clients with existing buildings often wanted to avoid refinancing, but doing the work required to get MPP incentives often requires them to refinance the building. Two small-building Partners reported that owners of smaller buildings often cannot afford Partner services. Three Partners said that some existing building and new construction clients can have difficulty obtaining additional financing to achieve 15% savings.

## 5.6 Conclusion

Overall, the 50 Partners interviewed and surveyed by the PE/MCA team represented a wide variety of firm characteristics and MPP experiences. Despite having questions and concerns about the program, Partners provided an overall positive evaluation of MPP's energy efficiency goals and processes.

Most Partners (74%) provided energy efficiency services in the multifamily sector before becoming a Partner and reported experiencing some type of growth – in services, employees, service territory, and potential clients – since becoming a Partner. A minority of Partners (21%-39%) attributed this growth to their experience in MPP. MPP appears to be recruiting Partners that already have many of the skills, employees, service territory, and clients needed to succeed as a Partner.

Partners also reported some spillover of the services and skills they learned from participation in MPP into MPP and non-MPP multifamily projects. For example, 12 of 34 Partners (35%), who accounted for 219 MPP projects, did not offer energy efficiency and/or ERP-like services before becoming a Partner and thus acquired these services through their MPP participation. About two-thirds of Partners (69%) reported providing energy-efficiency services to non-MPP multifamily clients, and 80% of these Partners provided the equivalent of MPP's ERP in non-MPP multifamily projects, after becoming a Partner. In addition, most Partners confirmed that, in the absence of MPP, they would recommend and provide MPP-incented services and measures.

Overall, experienced Partners indicated that MPP processes improved in versions 4 and 5 of the program. Through analyses of Partner interviews and surveys, the PE/MCA team identified specific processes that worked well and several areas for improvement.

1. *Client screening:* Phone interviews and site visits were the most common client screening methods used by Partners. Audits were frequently used for screening before the incentive for them was discontinued in Version 5. Inexperienced Partners reported screening out a larger percentage of

- clients than did the Experienced Partners, and NYSERDA may want to follow-up with these Partners more frequently to determine if they could use additional assistance with client screening.
2. *Application:* About half of the Partners said application processes worked very well, but many Partners suggested using a simpler form offered in multiple formats, providing training to help Partners complete and submit application forms, shortening the approval process and providing more consistent approvals and rejections. These could enable Partners to spend less time completing and submitting applications, and therefore, slightly reduce their fees for those services.
  3. *Financing:* Partners were providing financing recommendations to their clients who needed additional financing but several also reported that they and their clients were confused GJGNY financing. Partners recommended providing more information and possibly some training on the details of GJGNY financing. In addition, one Partner suggested revising the Electronic Funds Transfer form to make it clearer that NYSERDA would access only the client's account for direct deposit purposes.
  4. *Prescriptive and Fast Track paths:* A minority of Partners reported using either the Prescriptive path or the Fast Track path and, although these Partners said the paths worked well overall, they also indicated that the processes were not as streamlined as they had expected and expressed some concern about their inability to offer more flexible energy efficiency recommendations through either path.
  5. *Scoping session and ERPs:* Partners found the MPP scoping session to be very helpful and that ERP turnaround times were improving, but some Partners who experienced ERP approval times of up to several months recommended that more improvements in the approval time for ERPs could provide multiple benefits for Partners in regards to the fees they charge and in meeting project timeline deadlines.

Partners also found the benchmarking spreadsheet and energy modeling tools provided by NYSERDA to be complicated, with steep learning curves to use correctly and efficiently, and noted important barriers to performing benchmarking in existing buildings, such as getting access to tenant spaces, timing the benchmarking so it does not occur too late in the project, and acquiring energy usage data from utilities. Partners recommended more training on the use the benchmarking and energy modeling tools, and suggested NYSERDA consider EnergyPro software; greater coordination among NYSERDA, Partners, and clients to help with getting access to tenant spaces; performing benchmarking earlier in the process to prevent delays; and setting up a more streamlined method for acquiring energy use data from utilities to mitigate the time and effort currently required to do this.

6. *Approval of measures:* The majority of Partners reported an experience in which a recommended measure was not approved or an estimate was questioned by program staff. Most of these Partners said they dropped unapproved measures or found approvable replacements, but a minority of Partners either attempted to hide questionable measures in other data or bypassed TRC to go through NYSERDA for approval. These strategies may result in some questionable measures not being evaluated or not being properly evaluated by the appropriate staff.
7. *Reporting, testing, verifications, and inspections:* The majority of Partners reported overall satisfaction with the required reporting, testing, verifications, and inspections processes, but a few Partners suggested that MPP allow Partners to amend reports to incorporate changes to the project or conduct more inspections earlier in the process, and to perform QC and QA in the same trip to the project site in order to save time and charge less in fees. Partners also suggested providing an inspection form in multiple formats would enable them to complete the forms onsite and requiring less photo documentation that could save Partners time during the inspection and verification phases.
8. *Communications with NYSERDA and TRC:* The majority of Partners did not report any problems with contacting NYSERDA or TRC, but did suggest that it often can be difficult to reach and/or work with an experienced staff person. Experienced Partners reported that this improved since the hiatus, but suggested that NYSERDA and TRC focus more on retaining experienced staff and hiring more experienced staff.

*NYSERDA webinars, conferences, and training:* Most Partners reported attending NYSERDA webinars and, to a lesser extent, attending NYSERDA conferences. Some Partners recommended providing webinar materials before the webinar and archiving past webinars on an easy-to-access website. In addition, Partners would like to discuss more topics at the conferences and have more vendors invited to the conferences. Hosting the conferences in different locations in the State also might increase Partner attendance. Partners also reported that they would prefer additional training from NYSERDA, such as creating an ERP, conducting benchmarking and modeling using NYSERDA's recommended tools, project budgeting, applications of energy-efficient measures, BPI certification, and field training of Partner employees.

9. *Marketing:* Most Partners reported initiating the majority of their projects, but only about half said they did any marketing. MPP could support Partners that are not marketing their services; such assistance could increase the number of clients overall and the number of clients initiating projects. In addition, of those who did market their MPP services, only a minority used NYSERDA's marketing materials. Partners indicated that, if MPP provided more materials with simpler messages about the program, they might use the materials more often. Also, Partners

- suggested updating the website as often as possible to ensure that MPP information, and information about their firm and projects, are current.
10. *Oil-heated projects:* A majority of Partners reported working on oil-heated building projects, but a minority of them said they had experience with RGGI-funded oil-heated building projects. Overall, these Partners identified oil-heated buildings as barriers to participation in MPP. Two of the primary reasons for this were the variable levels of funding for RGGI and the lack of incentives in MPP for oil-heat conversions. Partners also mentioned that the energy analysis for oil-heated projects is more difficult and time-consuming than for electric and gas projects, and thus requires them to charge more for this service.
  11. *Effects of the MPP hiatus:* The program hiatus was one of the most cited issues with MPP. According to Partners, the hiatus eroded client and Partner trust in the program and caused substantial problems in many Partner-client relationships. If another hiatus were to occur, Partners would prefer NYSERDA to inform their clients of the hiatus, rather than require the Partners to perform this task, and that this could help reduce its negative impacts on the Partner-client relationship.
  12. *Inactivity:* Slightly less than half of the Partners surveyed by the PE/MCA team were inactive at the time of the survey. According to these Partners, reasons for their inactivity included: participation in the program was not profitable for their firm; the firm was too busy with other types of work; and they had had too many problems with program administration and process. Partners suggested that NYSERDA follow-up with inactive Partners after a period of inactivity to identify specific issues that can be addressed to improve Partner retention and the program overall.  
  
Permanently Removed Partners reported leaving the program because there was not enough benefit to offset the work required or because the Partner firm was not the ideal type of firm to serve as an MPP Partner. One Partner recommended using more rigorous Partner screening criteria to help reduce the number of Partners who join the program but become inactive and leave the program.
  13. *Market demand:* Some Partners reported that one of the largest barriers to their participation in the program is a lack of demand in the market. More outreach on behalf of NYSERDA and Partners – particularly to clients that may be affected by the economic downturn or volatility in the multifamily sector, or have low levels of awareness of energy efficiency benefits and programs – could help drive demand. In addition, two Partners suggested that NYSERDA might consider increasing technical requirements or reducing incentives in successive phases rather than doing both simultaneously, which they believed resulted in a reduction in demand.

14. *Client barriers to participation:* Partners also recommended some ways to overcome noted client participation barriers. First, Local Laws in New York could be a barrier to client participation because clients may become more interested in complying with the laws than saving more energy. A Partner suggested that NYSERDA could assist Partners and clients to both comply with Local Laws and achieve 15% savings through MPP more effectively. Second, some Partners mentioned that MPP's competition with other utility or state programs prevents some clients from participating in MPP if the other programs offer more benefits. Fostering more cross-program cooperation may help reduce this competition. Third, a few Partners suggested that providing to existing-building and smaller-building owners more incentives and/or low-interest financial assistance that does not require refinancing the property may increase their participation in the program.



## 6 Market Actor Surveys

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The following section describes the results from interviews and surveys conducted with market actors. For the purpose of this analysis, market actors are defined as firms that work in the multifamily sector, and may have participated in MPP, but are not Multifamily Performance Program Partners. The PE/MCA team identified four categories of market actors that may provide services to multifamily buildings: architects, engineers, energy efficiency consultants (EE consultants) and building contractors.

The goal of the survey was to establish a baseline of energy efficiency services and products offered in the multifamily market (outside MPP), and to determine whether MPP has changed the services or products market actors provide. There were two issues with the approach and the sample used that limit the validity of the results in serving as the desired baseline. The approach used removed Partners from the sample of market actors and as DPS has noted, therefore the comparisons between New York and Pennsylvania are not done using similar populations. The report crafted a post-survey correction for one question (as to whether firms were providing ERP-like services) that forces back in Partner responses, but the report does not do a similar adjustment for any of the other questions reported here. In the course of crafting that post-survey correction, it was discovered that the sample drawn from Dodge market actors may not have been a good choice for capturing the baseline for the MF energy efficiency services. It turns out that less than ¼ (24 out of 105) of Partners were listed in the Dodge data as having been a market actor involved in a multifamily project between 2010 and 2012. It appears as though many existing Partners were not involved in Dodge listed projects and that leads to concerns that the sample is not a good representation of the market actor list that have or could be Partners. Accordingly, the results presented should not be used to establish a baseline for MPP, and another survey using a broader list of market actors and not excluding Partners will need to be conducted.

In addition to surveying market actors in New York State (NYS), the PE/MCA team surveyed market actors based in Pennsylvania (PA) in order to compare conditions in NYS to those in a state in the same climate zone with similar urban and rural demographics and that has a relatively large multifamily market but not an extensive offering of multifamily energy efficiency programs.

Other states within the same climate zone were considered (see Table 6-1), but they were not ideal matches due to: large demographic differences in the rural and urban populations compared to NYS (e.g. Maine, New Hampshire, New Jersey, Vermont); the lack of a relatively large multifamily market compared to other states in the climate zone (e.g. Connecticut, Maine, New Hampshire, Rhode Island, Vermont); or, the influence of relatively extensive offerings of multifamily energy efficiency programs (e.g. Connecticut, Massachusetts, New Hampshire, New Jersey, Rhode Island, Vermont). States like California, Illinois, Michigan, Minnesota, and Ohio were also considered but these are located in different climate zones and/or fail to provide an ideal match on other criteria discussed above.

**Table 6-1. Population and Multifamily Housing and Policy Measures for New York State and Potential Comparisons States**

Type	Percent Urban Population <sup>a</sup>	Number of Multifamily Units (5+ unit buildings) <sup>b</sup>	Multifamily as Percent of Total Housing Units <sup>c</sup>	Good Multifamily Energy Efficiency Policies <sup>b</sup>
<b>New York State</b>	<b>88%</b>	<b>2,572,352</b>	<b>32.4%</b>	<b>Yes</b>
<b>Pennsylvania</b>	<b>79%</b>	<b>610,179</b>	<b>11.1%</b>	<b>No</b>
Connecticut	88%	252,808	17.6%	Yes
Maine	39%	60,939	8.7%	Yes
Massachusetts	92%	542,892	19.9%	Yes
New Hampshire	60%	81,527	13.8%	Yes
New Jersey	95%	696,571	19.8%	Yes
Rhode Island	91%	69,982	15.5%	Yes
Vermont	39%	31,767	10.2%	Yes
California	95%	2,983,403	22.5%	Yes
Illinois	89%	1,057,085	20.2%	No <sup>c</sup>
Maryland	87%	488,389	21.1	No
Michigan	75%	565,314	12.5%	Yes
Minnesota	73%	384,314	16.7%	Yes
Ohio	78%	696,486	13.7%	No

<sup>a</sup> Source: U.S. Census (2010).

<sup>b</sup> Source: CNT Energy & ACEEE. (January 2012). "Engaging as Partners in Energy Efficiency: Multifamily Housing and Utilities." Accessed May 5, 2014 at: <http://www.aceee.org/sites/default/files/publications/researchreports/a122.pdf>

<sup>c</sup> Chicago, in which the Energy Savers multifamily energy efficiency program has been operating since 2008, is an exception.

## 6.1 Data Collection and Analysis

Data collection was performed in two stages. First, the PE/MCA team completed in-depth interviews with six market actors in NYS (two architects, two engineers, and two building contractors) to inform the questionnaire design for additional surveys with samples of the four targeted market actor groups: architects, engineers, EE consultants, and building contractors. Second, the PE/MCA team compiled sample lists of and conducted telephone surveys with the four market actor groups in upstate NYS, downstate NYS, and Pennsylvania (PA). The samples of architects, engineers, and contractors were drawn from the last 18 months of Dodge data for projects that involved multifamily buildings.<sup>52</sup> The sample of EE

<sup>52</sup> McGraw Hill Construction. (2013). "McGraw Hill Dodge Players Data File, 2011-2013." Accessed at <http://dodge.construction.com/Analytics/login/>, September 2013.

consultants was drawn from Hoover's<sup>53</sup> listing of businesses identified under the "Energy Conservation Consulting" category.

The PE/MCA identified 24 MPP Partner firms in the Dodge and Hoover's lists. These firms were screened from the NYS lists since the PE/MCA team attempted to interview them separately with the other 81 Partner firms not in the list (Chapter 5). However, in analyses below in Section 6.5, the PE/MCA team combined the results from the Partner interviews with the results from market actor surveys in NYS to determine an estimated percentage of NYS market actors who conducted ERP-like activities for the majority of their multifamily projects.

In November 2013, the PE/MCA team completed 468 telephone surveys with market actors in NYS (341) and PA (127); the surveys ranged from eight to 40 minutes. Table 6-2 and Table 6-3 show the number of firms in the sample frame and their disposition after data collection concluded.

The original sample quota was established to reach a 90/10 sampling precision level for each of the four groups in upstate and downstate NYS and in PA. This resulted in the 12 groups in Table 6-2 and Table 6-3. The PE/MCA team screened out firms that had not been involved in the multifamily sector in the past five years, and exhausted the call list for all the groups except NYS downstate architects before reaching the quota, which resulted in an attempted census of these groups. However, the PE/MCA team used inferential statistics in analyses below to compare across groups (as opposed to population parameters that result from census surveys) since the eligible response rates for these groups were low, the Dodge and Hoover's databases did not contain the entire populations of these groups, and nonresponse bias was unable to be measured without data for market actor firms in the sample who did not complete an interview.<sup>54</sup> Thus, the use of inferential statistics for comparisons adds some statistical boundaries to the estimated percentages derived from the data.

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<sup>53</sup> Hoover's Inc. (2013). "Energy Conservation Consulting: New York and Pennsylvania." Dun & Bradstreet. Accessed at [www.hoovers.com](http://www.hoovers.com), November 2013.

<sup>54</sup> Population parameters (as opposed to inferential statistics) would be more meaningful and appropriate if the surveys resulted in a higher number of completes closer to approximating the population, if lists acquired from Dodge and Hoover's had a high level of confidence for including the entire populations of these groups, and/or if nonresponse bias could be measured.

**Table 6-2. NYS Disposition Summary**

Sample	Downstate New York				Upstate New York			
	Architects	Engineers	Contractors	EE Consultants	Architects	Engineers	Contractors	EE Consultants
Number in sample <sup>a</sup>	1,534	325	2,466	151	199	102	262	89
Number called	782	325	2,466	151	199	102	262	89
No answer <sup>b</sup>	474	200	1,792	73	100	51	171	44
Answered	308	125	674	78	99	51	91	45
Total Response Rate <sup>c</sup>	39%	38%	27%	52%	50%	50%	35%	51%
Not qualified <sup>d</sup>	243	71	607	34	52	33	63	27
Completes	65	54	67	44	47	18	28	18
Eligible Response Rate <sup>e</sup>	8%	17%	3%	29%	24%	18%	11%	20%
Original Quota	65	54	66	44	47	37	54	37
Sampling precision	90/10	Census	Census	Census	Census	Census	Census	Census

<sup>a</sup> Excluding 24 Partner firms in NYS.

<sup>b</sup> Includes wrong or incorrect number, non-working number, fax number, no answer at number, and hard refusals.

<sup>c</sup> Total answered / number called.

<sup>d</sup> Includes those screened out because they were not involved in the multifamily sector in the past five years.

<sup>e</sup> Completes / number called.

**Table 6-3. PA Disposition Summary**

Sample	PA Architects	PA Engineers	PA Contractors	PA EE Consultants
Number in sample	339	188	575	137
Number called	339	188	575	137
No answer <sup>a</sup>	196	112	393	80
Answered	143	76	182	57
Total Response Rate <sup>b</sup>	42%	40%	32%	42%
Not qualified <sup>c</sup>	86	44	153	48
Completes	57	32	29	9
Eligible Response Rate <sup>d</sup>	17%	17%	5%	7%
Original quota	57	55	61	46
Sampling precision	Census	Census	Census	Census

<sup>a</sup> Includes wrong or incorrect number, non-working number, fax number, no answer at number, and hard refusals.

<sup>b</sup> Total answered / number called.

<sup>c</sup> Includes those screened out because they were not involved in the multifamily sector in the past five years.

<sup>d</sup> Completes / number called.

In the applicable analyses below, the PE/MCA team included all the NYS market actors with statistically meaningful (p-values equal to or less than 0.10) comparisons between PA and NYS, downstate and upstate NYS, and the market actor groups. The PE/MCA team found many similarities in the work conducted by architects and engineers, so the team combined these groups when comparing them to contractors and EE consultants.

In addition, the PE/MCA team asked market actors how many multifamily new construction projects and how many multifamily existing building projects they were involved in during the previous two years. Those who answered “more than one” were asked how often they recommended energy-efficient measures and performed energy efficiency activities, such as conducting an energy audit or model, on a five-point scale, in which 1 was “Never” and 5 was “Always”. Those who answered one project were asked whether or not they recommended energy-efficient measures or performed energy efficiency activities in their project, on a “yes” or “no” scale. In the analyses in Sections 6.2 and 6.3 below, market actors who were involved in one project and who answered “yes” to the energy efficiency questions were combined with those who were involved in more than one project and who answered “always” to these questions. Market actors who were involved in one project and who answered “no” to the energy efficiency questions were combined with those who were involved in more than one project and who answered “never” to these questions.

The PE/MCA team also separated market actors who answered “always” to all the questions regarding how often they recommended energy-efficient measures and performed energy efficiency activities in their multifamily new construction or existing building projects from those who answered “often” to at least one of these questions. If market actors answered “often” to one or all of these questions, the PE/MCA team categorized them as “often” in the analyses; if the market actors answered “always” on all the questions, the PE/MCA team categorized them as “always” in the analyses. This was done to identify market actors who always did all the energy-efficient activities in all their projects and to compare them with market actors who did not always perform all the energy-efficient activities in all their projects, but who did perform these activities more often than “sometimes,” “rarely,” or “never.”

Furthermore, it should be noted that respondents may have over-reported the extent to which measures that exceeded energy code were recommended in multifamily new construction or existing building projects. Experienced market actors who worked on at least one multifamily new construction or existing building project in the past two or more years and reported that they made recommendations that exceeded energy code were asked why the frequency with which they made these recommendations had changed in the past five years. Almost one-quarter (22%) of these NYS market actors responded that the change was due to changes in code or regulations. This response reveals a misinterpretation of the concept of making “energy-efficient” recommendations that *exceed* energy codes, since making recommendations due to increases in the code is different from making “energy-efficient” recommendations over and above code. Therefore,

these firms were removed from the analysis of market actors who specified multifamily new construction measures that exceeded energy codes.

## 6.2 Firm Characteristics

Table 6-4 describes the percent of market actors surveyed who work in the multifamily sector, by business type and region. Overall, a significantly greater percentage of all market actor types – architects, engineers, contractors, and EE consultants – work in the multifamily sector in NYS than in PA.<sup>55</sup> It is notable that the largest difference occurs between EE consultants<sup>56</sup> in NYS and PA, since these professionals specialize in energy efficiency work. However, the larger percentages of market actor firms working in the multifamily sector in NYS were expected given the State’s larger population and greater percentage of multifamily residential buildings (Table 6-4).

**Table 6-4. Firms Contacted Who Work on Multifamily Projects<sup>a</sup>**

Type	Downstate New York	Upstate New York	PA
Architect	45% (140/308)	56% (55/99)	44% (63/143)
Engineer	67% (84/125)	49% (25/51)	42% (32/76)
Contractor	32% (213/674)	40% (36/91)	21% (38/182)
Energy Efficiency Consultant	64% (50/78)	47% (21/45)	18% (10/57)
<b>Total</b>	<b>41%</b> <b>(487/1,185)</b>	<b>48%</b> <b>(137/286)</b>	<b>31%</b> <b>(143/458)</b>
Percentage of Housing Units that Are Multifamily <sup>b</sup>	80.2%	27.4%	20.6%

<sup>a</sup> See Appendix B for significance tables.

<sup>b</sup> Source: U.S. Census <http://quickfacts.census.gov/qfd/states/36000.html>

Within NYS, a significantly higher percentage of architects worked in the multifamily sector in upstate than in downstate,<sup>57</sup> while a significantly greater percentage of engineers<sup>58</sup> and EE consultants<sup>59</sup> worked in the multifamily sector in downstate than in upstate (see Appendix B). There is also likely some crossover between regions. For example, an upstate architect may do work in downstate NYS.

<sup>55</sup>  $p \leq .001$ .

<sup>56</sup>  $p \leq .001$ .

<sup>57</sup>  $p \leq .10$ .

<sup>58</sup>  $p \leq .05$ .

<sup>59</sup>  $p \leq .10$ .

To better understand respondents' answers and provide context to their responses, the team asked market actors about their firm's characteristics, such as the number of employees and staffed offices in the State and out of the State, as well as the number of years the firm had been in their relevant industry (architectural, engineering, EE consulting, or building contracting) and in the multifamily sector (Table 6-5). NYS firms had an average of 18 employees at the respondent's location and an average of one additional staffed office in the State and less than one staffed office out of the State.<sup>60</sup> PA firms were substantially smaller, with an average of 13 employees at the respondents' locations, and an average of less than one additional staffed office in the State and less than one staffed office out of the State. Most (89%) of NYS firms surveyed had been working in the industry for ten or more years. Similarly, the majority (93%) of State firms surveyed had been providing services to the multifamily sector for five or more years. These findings were relatively consistent across state, region, and business type.

**Table 6-5. Firm Characteristics, by State**

Variable	NYS	PA
Average number of staffed offices in State (excluding respondent's location) <sup>a</sup>	1 (n=336)	< 1 (n=125)
Average number of staffed offices out of State <sup>a</sup>	< 1 (n=331)	< 1 (n=122)
Average number of employees in State at respondent's location <sup>a</sup>	18 (n=330)	13 (n=119)
Average number of employees in State (excluding respondent's location) <sup>a</sup>	30 (n=92)	23 (n=29)
Average number of employees out of State <sup>a</sup>	129 (n=64)	88 (n=23)
Percent who had worked in the industry for 10 or more years	89% (n=341)	89% (n=127)
Percent who had been providing services in the multifamily sector for five or more years	93% (n=341)	91% (n=127)

<sup>a</sup> Outliers who were more than three standard deviations from the mean were removed for all average calculations, as were those who responded that they didn't know.

### 6.2.1 Marketing Activities

The PE/MCA team asked a number of questions to determine market actors' marketing activities in the multifamily sector. Almost half (46%) of NYS market actors surveyed said they conducted marketing activities, which is a significantly lower than among the market actors in PA (61%) (Table 6-6).<sup>61</sup>

Additionally, NYS upstate market actors were significantly more likely to conduct marketing activities (53%) than were downstate market actors (42%).<sup>62</sup> Among NYS market actors, EE consultants were the

<sup>60</sup> Outliers who were more than three standard deviations from the mean were removed for all mean calculations.

<sup>61</sup>  $p \leq .05$ .

<sup>62</sup>  $p \leq .10$ .

most likely to conduct marketing activities (63%), followed by architects/engineers (46%), and contractors (35%).<sup>63</sup>

**Table 6-6. Marketing Activities<sup>a</sup>**

Activity	Downstate New York	Upstate New York	NYS Total	PA
Conducted marketing activities	42% (97/230)	53% (59/111)	46% (156/341)	61% (78/127)
Changed marketing in past five years	44% (40/90)	45% (25/56)	45% (65/146)	37% (26/70)

<sup>a</sup> See Appendix B for significance tables.

Among NYS market actors who said they conducted marketing activities, the most common qualities their firm emphasized in its marketing activities were referencing the firm's experience and professionalism (28%), specific services (23%), and energy efficiency and savings (18%). Of those NYS market actors who conducted marketing activities and had been working in the multifamily sector for five years or more, 45% indicated that they had changed their marketing messaging in the past five years. The most common change was a greater emphasis on green initiatives and energy efficiency (43%).

## 6.2.2 Services Provided

When asked what types of services they provided in the market in general and in the multifamily sector in particular, respondents revealed few differences. For example, 89% to 97% of market actors who provided a service in general also provided the service in multifamily projects. Table 6-7 shows the percentage of respondents who offered each type of service in the multifamily sector. The most frequent services offered were renovation and remodeling, project oversight, and new building construction (Table 6-7). NYS market actors were significantly more likely to offer renovation/ remodeling services (74%)<sup>64</sup> as well as installation of equipment (32%)<sup>65</sup> than were the PA market actors (66% and 21%, respectively). Conversely, PA market actors were significantly more likely to offer new building architectural design (53%)<sup>66</sup> and LEED building design (43%)<sup>67</sup> than were NYS market actors (39% and 33% respectively). Within the NYS upstate group, market actors were significantly more likely to offer new building architectural design (52%),<sup>68</sup> retrofit architectural design (52%),<sup>69</sup> and project oversight (81%)<sup>70</sup> than were

<sup>63</sup> See Appendix B.

<sup>64</sup>  $p \leq .10$ .

<sup>65</sup>  $p \leq .05$ .

<sup>66</sup>  $p \leq .10$ .

<sup>67</sup>  $p \leq .05$ .

<sup>68</sup>  $p \leq .05$ .

<sup>69</sup>  $p \leq .05$ .

<sup>70</sup>  $p \leq .05$ .



downstate NYS market actors (34%, 39%, and 70%, respectively). Within NYS and PA, the services offered in the multifamily sector also varied across business types (see Appendix B).

**Table 6-7. Multifamily Services Offered by Market Actors in NYS & PA**

Services Offered in Multifamily Sector	NYS (n=341)	PA (n=127)
Renovation/remodeling	74%	66%
Project oversight	71%	80%
New building construction	63%	70%
Retrofit architectural design	43%	50%
Retrofit engineering design	43%	39%
New building architectural design	39%	53%
New building engineering design	40%	47%
LEED building design	33%	43%
Installation of equipment	32%	21%
Building or system energy audits	29%	24%
Whole-building energy modeling	26%	28%
Retro-commissioning services	23%	20%

NYS respondents were significantly more likely to be aware of the Building Performance Institute's (BPI) Multifamily Building Analyst certification (33%) than were PA respondents (17%).<sup>71</sup> Within NYS, upstate market actors (42%) were significantly more likely to be aware of the certification than were downstate market actors (29%).<sup>72</sup> Additionally, NYS EE consultants were significantly more likely to be aware of the certification and to have an employee certified by BPI than were architects/engineers or contractors (Table 6-8).<sup>73</sup> Similarly, a greater percentage of PA EE consultants were aware of the certification than were architects/engineers and contractors.<sup>74</sup>

<sup>71</sup>  $p \leq .001$ .

<sup>72</sup>  $p \leq .05$ . See Appendix B.

<sup>73</sup>  $p \leq .05$ .

<sup>74</sup> Statistical comparisons were not permitted due to low cell counts for each group.

**Table 6-8. Market Actors' Awareness and Participation of BPI Multifamily Building Analyst Certification<sup>a</sup>**

Value	Architects/ Engineers	Contractors	EE Consultants	Total
<b>NYS</b>				
Aware of BPI Multifamily Building Analyst Certification	29% (53/184)	30% (28/95)	52% (32/62)	33% (113/341)
Someone in firm has BPI Multifamily Building Analyst Certification	8% (4/53)	25% (7/28)	41% (13/32)	21% (24/113)
<b>PA</b>				
Aware of BPI Multifamily Building Analyst Certification	16% (14/89)	10% (3/29)	56% (5/9)	17% (22/127)
Someone in firm has BPI Multifamily Building Analyst Certification	7% (1/14)	67% (2/3)	40% (2/5)	23% (5/22)

<sup>a</sup> See Appendix B for significance tables.

### 6.3 Multifamily New Construction Projects and Services

The PE/MCA team asked a number of questions to understand energy efficiency services provided in multifamily new construction and gut rehabilitation projects (multifamily new construction projects). The majority of surveyed firms in both NYS (67% of respondents and 15% of the sample) and PA (67% of respondents and 19% of the sample) had been involved in multifamily new construction projects in the past five years. Slightly fewer were involved in a multifamily new construction project in the past *two* years (62% in NYS, 61% in PA; Table 6-9). These numbers were somewhat consistent across the different firm types, with the exception of NYS upstate and PA EE consultants (lower), and NYS upstate architects/engineers and contractors (higher). During the past two years, NYS market actors who had done a multifamily new construction project in the previous two years had done an average of 11 multifamily new construction projects (4 median; range of 1 to 400),<sup>75</sup> compared to 9 for PA (3 median; range of 1 to 100).<sup>76</sup>

<sup>75</sup> After removing three outliers who reported completing 1,000 multifamily new construction projects in the previous two years. It is likely the respondents misinterpreted the question to include all the firm's projects in the past two years since 1,000 multifamily new construction projects in the past two years seemed an improbable high number for one firm.

<sup>76</sup> After removing one outlier who reported completing 1,000 multifamily new construction projects in the previous two years. It is likely the respondent misinterpreted the question to include all the firm's projects in the past two years since 1,000 multifamily new construction projects in the past two years seemed an improbable high number for one firm.

**Table 6-9. Market Actors Who Had Done a New Construction or Gut Rehabilitation Project in the Previous Two Years, by Firm Type and Location<sup>a</sup>**

Type	Downstate New York	Upstate New York	NYS Total	PA	Total
Architects/Engineers	61% (73/119)	75% (49/65)	66% (122/184)	60% (59/89)	66% (181/273)
Contractors	57% (38/67)	75% (21/28)	62% (59/95)	59% (17/29)	61% (76/124)
EE Consultants	52% (23/44)	39% (7/18)	48% (30/62)	11% (2/9)	45% (32/71)
<b>Total</b>	<b>58%</b> <b>(134/230)</b>	<b>69%</b> <b>(77/111)</b>	<b>62%</b> <b>(211/341)</b>	<b>61%</b> <b>(78/127)</b>	<b>62%</b> <b>(289/468)</b>

<sup>a</sup> See Appendix B for significance tables.

Market actors also reported how many of their multifamily new construction projects pursued LEED certification. Respondents reported that a total of 223 of 2,208 (10%)<sup>77</sup> NYS multifamily new construction projects and 36 of 657 (6%)<sup>78</sup> PA multifamily new construction projects pursued LEED certification. It should be noted that the PE/MCA team did not distinguish between projects that were registered to become LEED-certified and those that had received this certification, which may account for the greater-than-expected percentage of reported projects that pursued LEED certification. For example, 552 residential buildings in NYS and 425 residential buildings in PA had received LEED certification, while many more had registered to receive certification.<sup>79</sup>

Between 27% and 37% of all NYS market actors who had been involved in multifamily new construction projects in the previous two years reported that they always recommended at least one measure – lighting, heating, cooling, water heating, or insulation – that exceeded energy codes (Table 6-10). The percentage was highest for insulation (37%) and lowest for lighting (27%). A smaller percentage (17%) said that they *always* specify measures that exceed energy code for *all* of the measures listed in Table 6-10. In comparison, a smaller percentage of the PA market actors reported recommending each measure (18% - 31%), and all measures (12%), than did market actors in NYS (Table 6-12).

<sup>77</sup> After removing three outliers who reported completing 1,000 multifamily new construction projects in the previous two years. It is likely the respondents misinterpreted the question to include all the firm's projects in the past two years since 1,000 multifamily new construction projects in the past two years seemed an improbable high number for one firm.

<sup>78</sup> After removing one outlier who reported completing 1,000 multifamily new construction projects in the previous two years. It is likely the respondent misinterpreted the question to include all the firm's projects in the past two years since 1,000 multifamily new construction projects in the past two years seemed an improbable high number for one firm.

<sup>79</sup> U.S. Green Buildings Council. 2013. "LEED Projects Directory." Accessed at <http://www.usgbc.org/projects>, March 11, 2014.

**Table 6-10. NYS Market Actors Who Reported Often or Always Specifying Measures that Exceed Energy Code and Had Done Modeling, by Region<sup>c</sup>**

Measure Specified	Downstate New York (n=120)		Upstate New York (n=70)		NYS Total (n=190)	
	Often	Always	Often	Always	Often	Always
Specified measures that exceed energy code in: <sup>a</sup>						
▪ Lighting	18%	23%	19%	36%	18%	27%
▪ Heating	22%	31%	23%	33%	22%	32%
▪ Cooling	20%	29%	21%	34%	21%	31%
▪ Water Heating	21%	28%	16%	33%	19%	30%
▪ Insulation	19%	35%	20%	41%	19%	37%
Specified all measures <sup>b</sup>	<b>12%</b>	<b>15%</b>	<b>14%</b>	<b>21%</b>	<b>13%</b>	<b>17%</b>
Simulation model of energy usage developed <sup>a</sup>	8%	10%	9%	11%	8%	11%
Specified all measures AND did modeling <sup>b</sup>	<b>3%</b>	<b>3%</b>	<b>9%</b>	<b>7%</b>	<b>5%</b>	<b>4%</b>
% of projects in which all measures were specified and modeling was performed	<b>7%</b>	<b>1%</b>	<b>8%</b>	<b>9%</b>	<b>8%</b>	<b>3%</b>

<sup>a</sup> Questions were asked using a five-point scale of “never,” “rarely,” “sometimes,” “often,” or “always.”

<sup>b</sup> “Always” includes market actors who reported “always” for all questions; “Often” includes market actors who reported at least “often” on any one question.

<sup>c</sup> See Appendix B for significance tables.

A higher percentage of NYS upstate market actors reported recommending each measure and all measures, compared to the percentage of downstate market actors (Table 6-10). Among firm types in NYS, a higher percentage of architects/engineers and EE consultants reported recommending each measure than did contractors; and more architects/engineers (19%) reported recommending all the measures than did EE consultants or contractors (15%; Table 6-11). In PA, a higher percentage of EE consultants recommended each measure and all measures, compared to what was recommended by architects/engineers or contractors (Table 6-12).

In NYS, 11% of market actors reported that they had provided an energy model in all of their firm’s multifamily new construction projects in the previous two years (Table 6-10). Among these NYS market actors, 65% indicated that at least one project had pursued LEED certification, in which an energy model was required. Four percent of NYS market actors said they always recommended all of the energy-efficient measures *and* always provided an energy model, and these market actors represent 3% of all new construction projects (Table 6-10). These numbers were slightly lower for market actors in PA, where 9% always conducted an energy model, and 3% always recommended all energy-efficient measures *and* always provided an energy model; these market actors accounted for 2% of all new construction projects (Table

6-11). Among PA market actors who always provided energy models, 29% reported working on at least one project that pursued LEED certification.

**Table 6-11. NYS Market Actors Who Reported Often or Always Specifying Measures that Exceed Energy Code and Have Done Modeling, by Business Type<sup>c</sup>**

Measure Specified	Architects/Engineers (n=109)		Contractors (n=54)		EE Consultants (n=27)	
	Often	Always	Often	Always	Often	Always
Specified measures that exceed energy code in: <sup>a</sup>						
▪ Lighting	22%	29%	11%	19%	19%	37%
▪ Heating	25%	35%	15%	22%	26%	37%
▪ Cooling	26%	35%	7%	22%	26%	33%
▪ Water Heating	24%	31%	7%	22%	22%	41%
▪ Insulation	22%	42%	17%	32%	15%	30%
Specified all measures <sup>b</sup>	<b>17%</b>	<b>19%</b>	<b>2%</b>	<b>15%</b>	<b>15%</b>	<b>15%</b>
Simulation model of energy usage developed <sup>a</sup>	7%	5%	7%	17%	11%	22%
Specified all measures AND did modeling <sup>b</sup>	<b>6%</b>	<b>0%</b>	<b>4%</b>	<b>9%</b>	<b>7%</b>	<b>11%</b>
% of projects in which all measures were specified and modeling was performed	<b>10%</b>	<b>0%</b>	<b>1%</b>	<b>4%</b>	<b>4%</b>	<b>18%</b>

<sup>a</sup> Questions were asked using a five-point scale of “never,” “rarely,” “sometimes,” “often,” or “always.”

<sup>b</sup> “Always” includes market actors who reported “always” for all questions; “Often” includes market actors who reported at least “often” on any one question.

<sup>c</sup> See Appendix B for significance tables.

More NYS upstate market actors always provided an energy model than did the downstate market actors. This was also the case for upstate market actors who both always recommended all measures and always conducted an energy model (Table 6-10). In NYS, a significantly larger percentage of EE consultants<sup>80</sup> and contractors<sup>81</sup> reported always providing an energy model, and always recommending all energy-efficient measures and always providing an energy model; these were significantly greater percentages than for architects/engineers (Table 6-11).<sup>82</sup> In PA, a greater percentage of contractors always provided an energy model compared to architects/engineers and EE consultants, but a greater percentage of architects/engineers both always recommended all measures and always provided an energy model compared to contractors and EE consultants (Table 6-12).

<sup>80</sup>  $p \leq .05$ .

<sup>81</sup>  $p \leq .05$ .

<sup>82</sup>  $p \leq .001$ .

**Table 6-12. PA Market Actors Who Reported Often or Always Specifying Measures that Exceeded Energy Code and Have Done Modeling, by Business Type<sup>c</sup>**

Measures Specified	Architects/Engineers (n=58)		Contractors (n=17)		EE Consultants (n=2)		PA Total (n=77)	
	Often	Always	Often	Always	Often	Always	Often	Always
Specified measures that exceed energy code in: <sup>a</sup>								
▪ Lighting	29%	21%	6%	24%	0%	100%	23%	23%
▪ Heating	31%	28%	18%	12%	50%	50%	29%	25%
▪ Cooling	33%	22%	24%	18%	50%	50%	31%	22%
▪ Water Heating	19%	21%	24%	6%	50%	50%	21%	18%
▪ Insulation	21%	33%	12%	24%	50%	50%	19%	31%
Specified all measures <sup>b</sup>	<b>14%</b>	<b>12%</b>	<b>6%</b>	<b>6%</b>	<b>50%</b>	<b>50%</b>	<b>13%</b>	<b>12%</b>
Simulation model of energy usage developed <sup>a</sup>	10%	7%	0%	18%	50%	0%	9%	9%
Specified all measures AND did modeling <sup>b</sup>	<b>5%</b>	<b>3%</b>	<b>6%</b>	<b>0%</b>	<b>50%</b>	<b>0%</b>	<b>6%</b>	<b>3%</b>
% of projects in which all measures were specified and modeling was performed	<b>17%</b>	<b>3%</b>	<b>5%</b>	<b>0%</b>	<b>0%</b>	<b>0%</b>	<b>14%</b>	<b>2%</b>

<sup>a</sup> Questions were asked using a five-point scale of “never,” “rarely,” “sometimes,” “often,” or “always.”

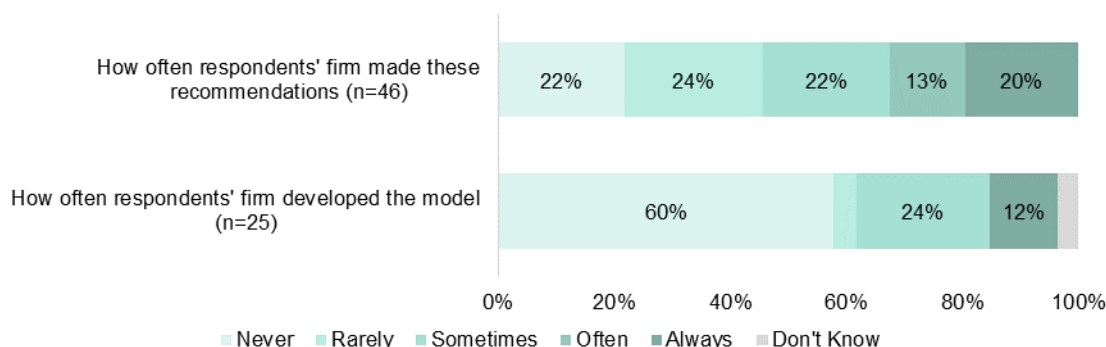
<sup>b</sup> “Always” includes market actors who reported “always” for all questions; “Often” includes market actors who reported at least “often” on any one question.

<sup>c</sup> See Appendix B for significance tables.

Overall, the differences reported above were largely unchanged when including the market actors who reported specifying energy-efficient measures or conducting energy models “often.” The only exception was the group of PA EE consultants, of which 50% to 100% recommended measures and provided an energy model *often* or *always*. In all cases but lighting (see Table 6-10), more than half of the market actors reported “often” or “always” specifying measures that exceeded code.

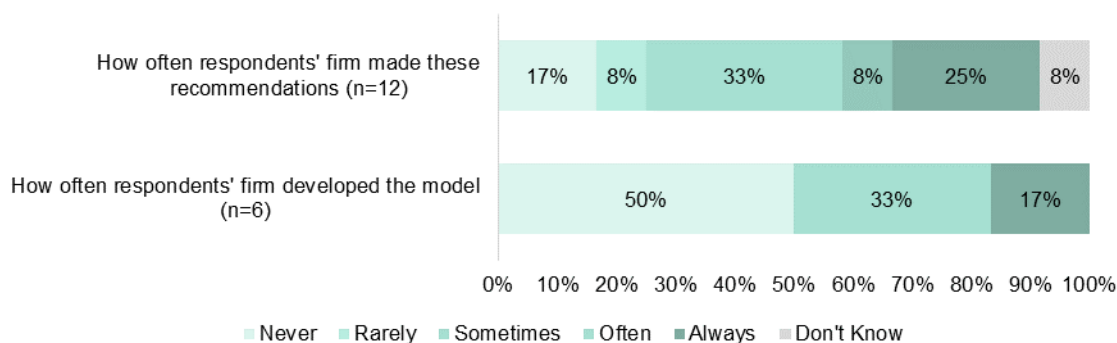
Contractors may work on projects in which energy-efficient measures were recommended or energy models were developed, but their firm may not have performed these activities. Instead, another firm may have performed these activities on behalf of the contractor. Twenty percent of NYS contractors reported that their firm always made recommendations for energy-efficient measures compared to 22% who reported that their firm never made recommendations, (Figure 6-1), while 12% of contractors reported that their firm always developed the simulation model of energy usage and 60% reported that another firm always developed the energy model.

**Figure 6-1. Frequency with Which NYS Contractors' Firms, versus Another Firm, Made Recommendations that Exceeded Energy Code and Developed an Energy Usage Model**



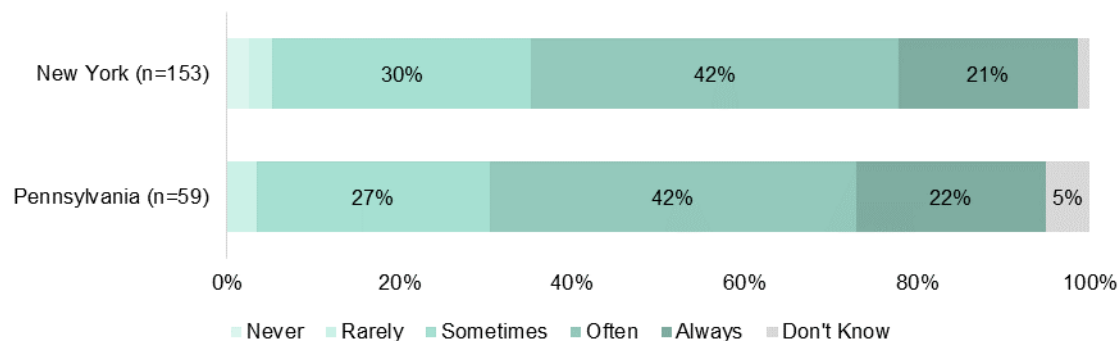
Twenty-five percent of PA contractors reported that their firm always made recommendations for energy-efficient measures compared to 17% who reported never making recommendations (Figure 6-2), while 17% of PA contractors reported that their firm always developed the simulation model of energy usage and 50% reported that another firm always developed the energy model.

**Figure 6-2. Frequency with Which PA Contractors' Firms, versus Another Firm, Made Recommendations that Exceeded Energy Code and Developed an Energy Usage Model**



The PE/MCA team also asked questions to gauge how often multifamily new construction building owners adopted recommendations that exceeded energy codes and accepted the results of the simulation model of energy usage. Less than one-quarter (21%) of the 153 NYS market actors who made recommendations that exceeded energy code indicated that building owners always accepted these recommendations (Figure 6-3). The numbers for PA were similar; less than one-quarter (22%) of the 59 PA market actors who made recommendations that exceeded energy code indicated that the building owners always accepted these recommendations (Figure 6-4).

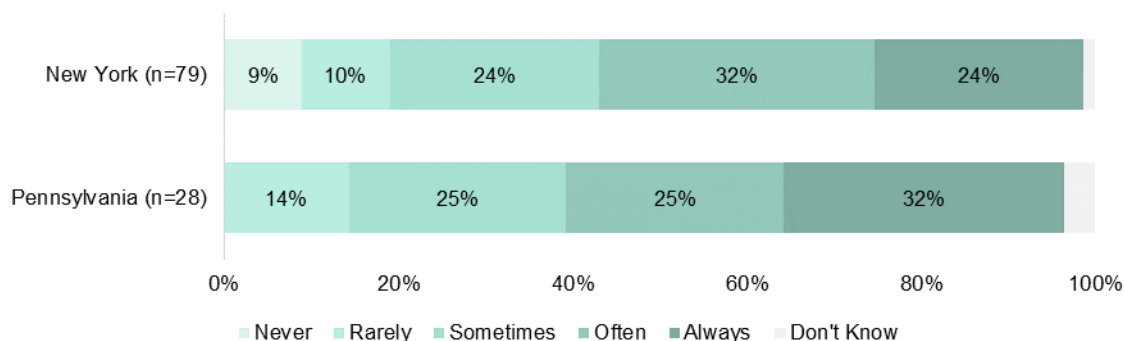
**Figure 6-3. Frequency with Which Building Owners Adopted Recommendations that Exceeded Energy Code<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables.

In addition, almost one-quarter (24%) of the 79 NYS market actors who developed an energy usage model indicated that building owners always accepted recommendations from the model (Figure 6-3); this percentage was higher in PA (32%; Figure 6-4). There were no significant differences between states or firm types in either state, although a moderately greater percentage of downstate NYS market actors said that building owners always accepted recommendations that exceeded energy code than did the upstate NYS market actors.<sup>83</sup>

**Figure 6-4. Frequency with Which Building Owners Accepted Recommendations from Simulation Model of Energy Usage<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables.

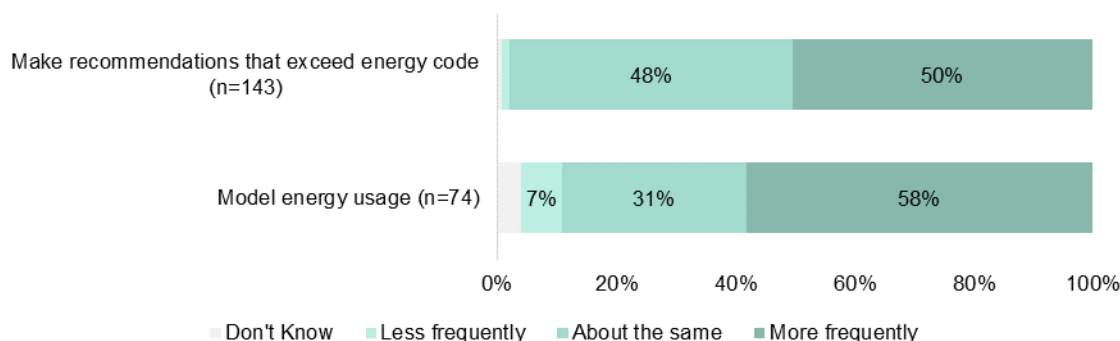
As shown in Figure 6-5, more than half (58%) of NYS market actors reported that they are modeling energy usage more frequently than they did five years ago, and half (50%) reported making recommendations that exceeded energy efficiency more frequently. The percentage of market actors who

<sup>83</sup>  $p \leq .10$ .



made recommendations that exceeded energy code more frequently was greater among NYS contractors (56%) and EE consultants (65%) than among the architects/engineers (44%).<sup>84</sup>

**Figure 6-5. Frequency with Which NYS Market Actors Made Recommendations that Exceeded Energy Code and Modeling Energy Usage, Compared to Five Years Ago<sup>a</sup>**



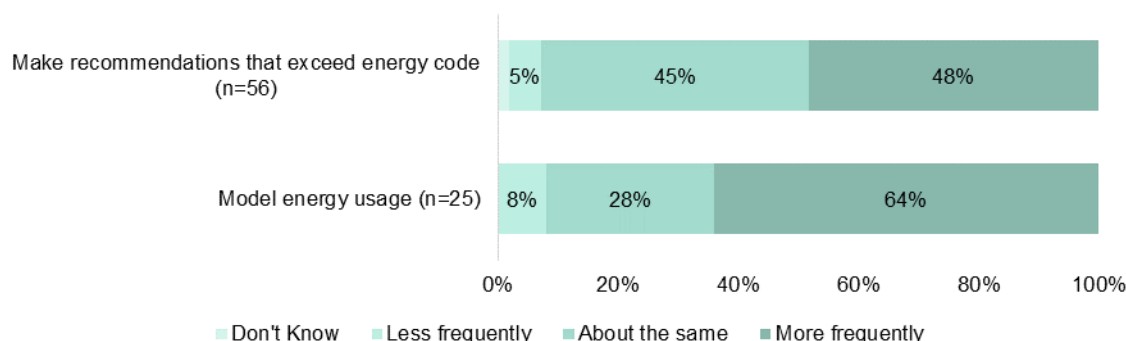
<sup>a</sup> See Appendix B for significance tables.

The most common reason NYS market actors provided for why they conducted energy models more frequently in 2013 than they did in the previous five years was the escalating emphasis on energy savings and energy efficiency in the industry (21%). These market actors also indicated that the most common reasons they recommended measures that exceeded energy efficiency code in the previous five years were the increasing emphasis on energy savings and energy efficiency (29%), and an increasing interest in cost savings (21%) from clients.

Compared to NYS, a slightly smaller percentage of market actors in PA reported making recommendations that exceeded energy code more frequently than in the previous five years (48% versus 50% in NYS), while a greater percentage of PA market actors reported more frequently modeling energy usage (64% versus 58% for NYS; Figure 6-5 and Figure 6-6). Of the 16 PA market actors who said they had developed simulation models of energy usage more frequently than in the previous five years, the most common reasons were acquiring grants and funding (19%) and increased client interest (19%). Of the 27 PA market actors who reported an increased frequency of recommending measures that exceeded energy efficiency code in the past five years, the most common reasons were an increased interest in “going green” in general from clients (22%) and to meet clients’ interests (19%).

<sup>84</sup> Statistical comparisons were not permitted due to low cell counts for each group.

**Figure 6-6. Frequency with Which PA Market actors Made Recommendations that Exceeded Energy Code and Modeling Energy Usage, Compared to Five Years Ago<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables.

## 6.4 Multifamily Existing Building Projects and Services

The PE/MCA team asked market actors about their multifamily existing building upgrade and retrofit projects (multifamily existing building projects), including the energy-efficient services provided in these projects. Nearly three-quarters of NYS firms (73% of respondents and 17% of the sample) and nearly two-thirds of PA firms (64% of respondents and 18% of sample) had been involved in a multifamily existing building project in the previous five years (Table 6-13).<sup>85</sup> These percentages were slightly lower for firms that had been involved in a multifamily existing building project in the past two years (62% for NYS and 55% for PA). These percentages also were significantly lower for NYS downstate contractors than for upstate contractors.<sup>86</sup>

**Table 6-13. Percent of Market Actors Who Had Completed Retrofit Projects in the Previous Two Years, by Market Actor Type and Location<sup>a</sup>**

Type	Downstate New York	Upstate New York	NYS Total	PA	Total
Architects/Engineers	63% (75/119)	62% (40/65)	63% (115/184)	55% (49/89)	60% (164/273)
Contractors	46% (31/67)	71% (20/28)	54% (51/95)	55% (16/29)	54% (67/124)
EE Consultants	73% (32/44)	67% (12/18)	71% (44/62)	56% (5/9)	69% (49/71)
<b>Total</b>	<b>60% (138/230)</b>	<b>65% (72/111)</b>	<b>62% (210/341)</b>	<b>55% (70/127)</b>	<b>60% (280/468)</b>

<sup>a</sup> See Appendix B for significance tables.

<sup>85</sup>  $p \leq .05$ .

<sup>86</sup>  $p \leq .05$ .

In addition, during the previous two years, NYS market actors had been involved in an average of 14 multifamily existing building projects<sup>87</sup> (3 median; range from 1 to 500), compared to 7 for PA (3 median; range from 1 to 40).

Market actors in NYS noted that they pursued LEED certification in 105 (4%) of the 2,579<sup>88</sup> multifamily existing building projects reported. PA market actors said that they pursued LEED certification in 21 of 436 multifamily existing building projects (5%) reported. The PE/MCA team did not distinguish between projects that were registered to become LEED certified and those that actually had received this certification, which may account for the greater than expected percentage of projects that pursued LEED certification. For example, 552 residential buildings in NYS and 425 residential buildings in PA had received LEED certification, while many more had registered to receive certification.<sup>89</sup>

Among NYS market actors who had done at least one existing building project in the previous two years, 61% reported conducting energy audits for those projects (9% of the sample; Table 6-14). This was lower for NYS downstate market actors than for upstate market actors, and significantly lower for architects/engineers in the State than for EE consultants<sup>90</sup> and contractors.<sup>91</sup> The trends were similar for PA. Almost one-fifth (19%) of NYS market actors who conducted audits also reported at least one project that pursued LEED certification; similarly, 17% of PA market actors who conducted audits reported at least one project that pursued LEED certification.

**Table 6-14. Market Actors Involved in a Multifamily Existing Building Project in the Previous Two Years Who Provided an Energy Audit, by Region and Firm Type<sup>a</sup>**

Market Actor	Percent of Respondents	Percent of Sample
<b>NYS Total</b>	<b>61%</b>	<b>9%</b>
<b>New York Downstate Total</b>	<b>58%</b>	<b>7%</b>
▪ Architects/Engineers	48%	8%
▪ EE consultants	75%	31%
▪ Contractors	65%	3%
<b>New York Upstate Total</b>	<b>68%</b>	<b>17%</b>
▪ Architects/Engineers	55%	15%
▪ EE consultants	75%	20%
▪ Contractors	90%	20%

<sup>87</sup> Mean after removing three outliers who were more than three standard deviations from the mean.

<sup>88</sup> After removing 3 outliers.

<sup>89</sup> U.S. Green Buildings Council. 2013. "LEED Projects Directory." Accessed at <http://www.usgbc.org/projects>, March 11, 2014.

<sup>90</sup>  $p \leq .05$ .

<sup>91</sup>  $p \leq .001$ .

Market Actor	Percent of Respondents	Percent of Sample
continued		
<b>PA Total</b>	<b>60%</b>	<b>9%</b>
▪ Architects/Engineers	51%	11%
▪ EE consultants	100%	9%
▪ Contractors	75%	7%

<sup>a</sup> See Appendix B for significance tables.

Between 40% and 51% of all NYS market actors reported always addressing at least one measure – lighting, heating, cooling, water heating, or insulation – during their energy audits in their multifamily existing building projects during the previous two years (Table 6-15). The greatest percentage was for insulation and heating (51%) and the lowest was for cooling (40%). A substantially smaller percentage (23%) reported always addressing all the measures listed in Table 6-16 in their multifamily existing building projects. The results were somewhat different among the PA market actors. A smaller percentage of the PA market actors always addressed at least one measure (33-43%), especially insulation measures,<sup>92</sup> but about the same percentage of market actors in PA (24%) and NYS (23%) always addressed all the measures (Table 6-17).

Overall, a greater percentage of NYS upstate market actors compared to downstate allies reported always addressing lighting and insulation measures than did the downstate allies. Conversely, more NYS downstate market actors reported always addressing cooling and water heating measures than did the upstate market actors (Table 6-15).

**Table 6-15. NYS Market Actors Who Reported Often or Always Addressing Specific Measures During Audits and Conducting Modeling Activities, by Region<sup>c</sup>**

Measures Addressed	Downstate New York (n=80)		Upstate New York (n=49)		NYS Total (n=129)	
	Often	Always	Often	Always	Often	Always
Of those who conduct audits, energy audit addressed: <sup>a</sup>						
▪ Lighting	24%	45%	29%	53%	26%	48%
▪ Heating	30%	51%	22%	51%	27%	51%
▪ Cooling	26%	41%	20%	37%	24%	40%
▪ Water Heating	24%	48%	16%	41%	21%	45%
▪ Insulation	21%	49%	16%	55%	19%	51%
Audit addressed ALL measures <sup>b</sup>	<b>19%</b>	<b>21%</b>	<b>12%</b>	<b>25%</b>	<b>16%</b>	<b>23%</b>

<sup>92</sup>  $p \leq .05$ .

Measures Addressed	Downstate New York (n=80)		Upstate New York (n=49)		NYS Total (n=129)	
	Often	Always	Often	Always	Often	Always
Estimate energy savings cost <sup>a</sup>	20%	38%	18%	39%	19%	38%
continued						
Estimate installed costs <sup>a</sup>	26%	33%	14%	43%	19%	36%
Provided modeled energy savings <sup>a</sup>	23%	16%	12%	20%	19%	18%
Owner provided a written report <sup>a</sup>	25%	38%	10%	39%	19%	38%
Conducted ALL modeling activities <sup>b</sup>	14%	8%	10%	12%	12%	9%
Conducted ALL modeling activities AND addressed ALL measures <sup>b</sup>	4%	5%	4%	6%	4%	5%
% of projects in which ALL modeling activities were performed and ALL measures were addressed	4%	4%	1%	17%	3%	8%

<sup>a</sup> Questions were asked using a five-point scale of “never,” “rarely,” “sometimes,” “often,” or “always”.

<sup>b</sup> “Always” includes market actors who reported “always” for all questions; “Often” includes market actors who reported at least “often” on any one question.

<sup>c</sup> See Appendix B for significance tables.

In addition, more NYS upstate market actors also always addressed all the measures than did downstate market actors. Among firm types in NYS, a greater percentage of architects/engineers and EE consultants than contractors always addressed both individual measures and all measures (Table 6-16). Similarly, a greater percentage of PA architects/engineers said they always addressed both individual measures and all measures than did the contractors in that state (Table 6-17). While a greater percentage of EE consultants reported always addressing both individual measures and all measures than did architects/engineers, the sample size for this group was very low.<sup>93</sup>

<sup>93</sup> Of the nine Pennsylvania EE consultants, only five had worked on an existing building project in the past two years, resulting in a very low group cell count for these questions.

**Table 6-16. NYS Market Actors Who Reported Often or Always Addressing Specific Measures During Audits and Conducting Modeling Activities, by Business Type<sup>c</sup>**

Measures Addressed	Architect/ Engineers (n=58)		Contractors (n=38)		EE Consultant (n=33)	
	Often	Always	Often	Always	Often	Always
Of those who conduct audits, energy audit addressed: <sup>a</sup>						
▪ Lighting	22%	47%	29%	42%	27%	58%
▪ Heating	29%	59%	24%	34%	27%	58%
▪ Cooling	29%	48%	18%	21%	21%	45%
▪ Water Heating	19%	50%	16%	37%	30%	45%
▪ Insulation	16%	59%	21%	50%	24%	39%
Audit addressed ALL measures <sup>b</sup>	<b>17%</b>	<b>26%</b>	<b>11%</b>	<b>16%</b>	<b>21%</b>	<b>24%</b>
Estimate energy savings cost <sup>a</sup>	24%	24%	11%	37%	21%	64%
continued						
Estimate installed costs <sup>a</sup>	21%	29%	21%	26%	24%	61%
Provided modeled energy savings <sup>a</sup>	16%	9%	18%	24%	24%	27%
Owner provided a written report <sup>a</sup>	24%	22%	11%	37%	21%	67%
Conducted ALL modeling activities <sup>b</sup>	<b>12%</b>	<b>0%</b>	<b>5%</b>	<b>11%</b>	<b>21%</b>	<b>24%</b>
Conducted ALL modeling activities AND addressed all measures <sup>b</sup>	<b>3%</b>	<b>0%</b>	<b>3%</b>	<b>5%</b>	<b>6%</b>	<b>15%</b>
% of projects in which ALL modeling activities were performed and ALL measures were addressed	<b>3%</b>	<b>0%</b>	<b>1%</b>	<b>1%</b>	<b>6%</b>	<b>32%</b>

<sup>a</sup> Questions were asked using a five-point scale of “never,” “rarely,” “sometimes,” “often,” or “always”.

<sup>b</sup> “Always” includes market actors who reported “always” for all questions; “Often” includes market actors who reported at least “often” on any one question.

<sup>c</sup> See Appendix B for significance tables.

In NYS, about one-third of all market actors said they always estimated energy savings costs and installed costs in their energy audit(s), and always provided the building owner a written report of results, while 18% reported that they always estimated modeled energy savings in their energy audits for multifamily existing building projects during the previous two years (Table 6-15). Eleven percent of NYS market actors reported always doing all of these activities as part of their energy audit(s). These numbers are slightly different in PA, in which 43% of market actors always estimated energy savings costs, about one-third estimated installed costs and provided the owner with a written report of results, and 14% provided energy savings estimates. Overall, 12% of the market actors in PA reported always performing all of these activities as a part of their energy audit(s) in that state (Table 6-17).

There were also notable differences between regions and firm types. For example, a greater percentage of NYS upstate market actors reported always performing each energy audit activity and all energy audit activities combined than did the downstate market actors (Table 6-15). A greater percentage of EE consultants in both NYS and PA also always performed most energy audit activity (with one exception in

PA) and all activities combined; these percentages were greater than those for architects/engineers or contractors in these states (Table 6-16 and Table 6-17).

**Table 6-17. PA Market Actors Who Reported Often or Always Addressing Specific Measures During Audits and Conducting Modeling Activities, by Business Type<sup>c</sup>**

Measures Addressed	Architect/ Engineer (n=25)		Contractor (n=12)		EE Consultant (n=5)		PA Total (n=42)	
	Often	Always	Often	Always	Often	Always	Often	Always
Of those who conduct audits, energy audit addressed: <sup>a</sup>								
▪ Lighting	16%	48%	33%	17%	0%	80%	19%	43%
▪ Heating	24%	48%	25%	17%	20%	60%	24%	40%
▪ Cooling	28%	44%	25%	17%	20%	60%	26%	38%
▪ Water Heating	16%	36%	25%	17%	20%	60%	19%	33%
▪ Insulation	20%	36%	17%	17%	20%	60%	19%	33%
Audit addressed ALL measures <sup>b</sup>	<b>16%</b>	<b>24%</b>	<b>8%</b>	<b>8%</b>	<b>0%</b>	<b>60%</b>	<b>12%</b>	<b>24%</b>
Estimate energy savings cost <sup>a</sup>	12%	40%	17%	33%	20%	80%	14%	43%
Estimate installed costs <sup>a</sup>	28%	32%	0%	25%	20%	80%	19%	36%
Provided modeled energy savings <sup>a</sup>	16%	12%	8%	8%	0%	40%	12%	14%
Owner provided a written report <sup>a</sup>	28%	44%	17%	17%	60%	40%	29%	36%
Conducted ALL modeling activities <sup>b</sup>	<b>4%</b>	<b>8%</b>	<b>8%</b>	<b>8%</b>	<b>0%</b>	<b>40%</b>	<b>5%</b>	<b>12%</b>
Conducted ALL modeling activities AND addressed all measures <sup>b</sup>	<b>4%</b>	<b>8%</b>	<b>0%</b>	<b>8%</b>	<b>0%</b>	<b>40%</b>	<b>2%</b>	<b>12%</b>
% of projects in which ALL modeling activities were performed and ALL measures were addressed	<b>5%</b>	<b>22%</b>	<b>0%</b>	<b>1%</b>	<b>0%</b>	<b>93%</b>	<b>3%</b>	<b>26%</b>

<sup>a</sup> Questions were asked using a five-point scale of "never," "rarely," "sometimes," "often," or "always".

<sup>b</sup> "Always" includes market actors who reported "always" for all questions; "Often" includes market actors who reported at least "often" on any one question.

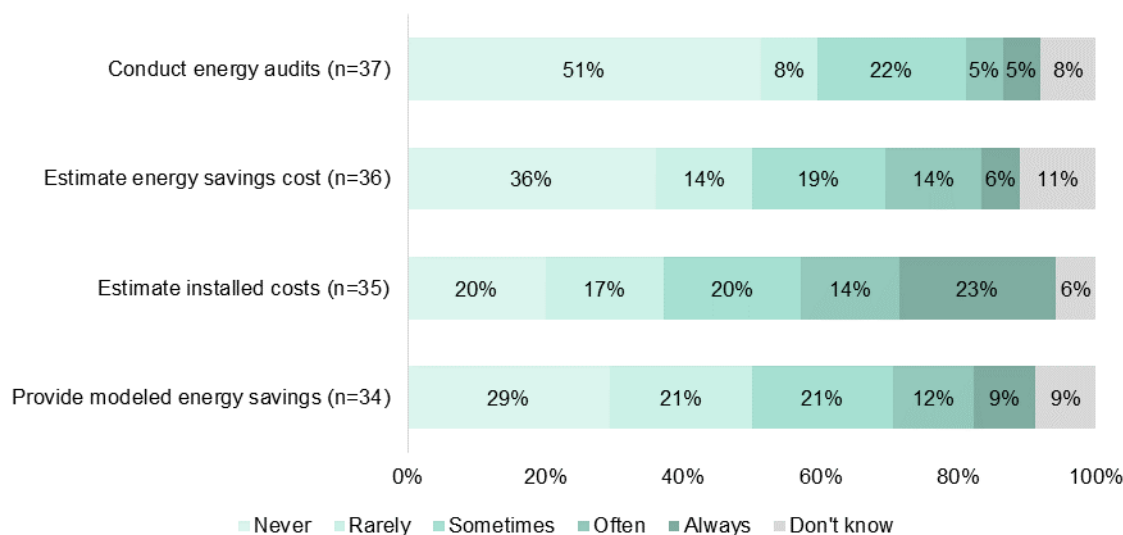
<sup>c</sup> See Appendix B for significance tables.

Overall, 5% of NYS market actors always addressed all energy-efficient measures and always performed all the energy audit activities, and these market actors account for 8% of all existing building projects (Table 6-15). These numbers were higher in PA (12% and 26%, respectively) (Table 6-17). There was very little difference between upstate and downstate NYS market actors (Table 6-15), while significantly more NYS EE consultants always performed these combined activities (23%) compared to contractors (8%) or architects/engineers (0%; Table 6-16). Similar trends were found in PA among the different firm types (Table 6-17).

Some of the differences between regions and firm types became more noticeable when the market actors who reported specifying energy-efficient measures or conducting audit activities “often,” were included in the analysis, but overall the differences reported above remained largely unchanged.

Contractors may work on multifamily existing building projects for which audits are conducted, but their firm may not actually conduct the audits. The frequency with which the contractor firms performed these activities, rather than having another firm do them, varied by activity. For example, 5% of NYS contractors that had an energy audit conducted for their existing building projects always conducted the audit themselves, while 51% relied on another firm for that task (Figure 6-7).

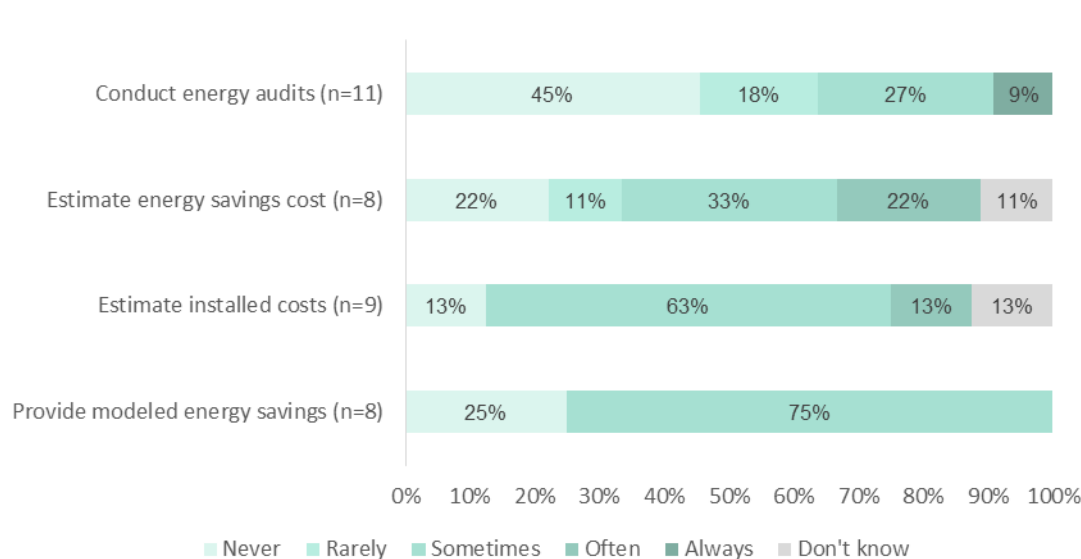
**Figure 6-7. Frequency with Which NYS Contractors’ Firms Conduct Audits and Perform Modeling Activities versus Another Firm**



Six percent of contractors reported always estimating energy savings costs, while 36% never estimated these costs and relied on another firm; 23% reported always being the firm that estimated installed costs while 20% never estimated these costs and relied on another firm to do so; and 9% reported always being the firm that provided modeled energy savings (compared to 29% that never provided these savings and relied on another firm (Figure 6-7). In PA, 9% of contractors reported being the firm that always conducted energy audits (compared to 51% who never conducted the audits and relied on another firm) and none of the contractors reported being the firm that always estimated energy savings costs or installed costs, or provided modeled energy savings (Figure 6-8).

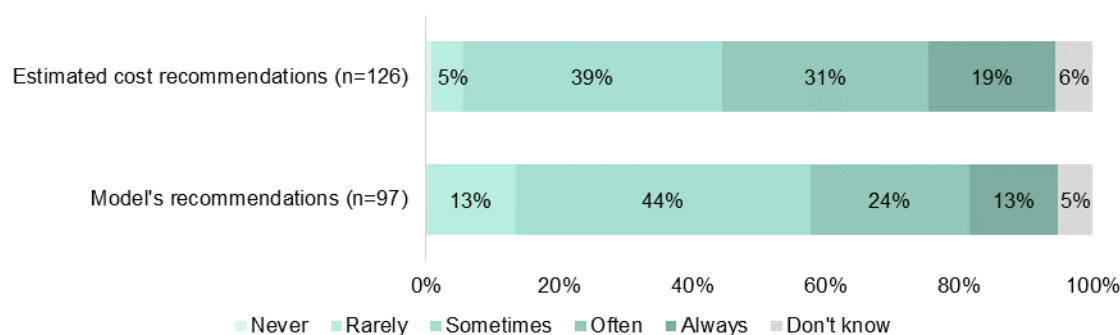


**Figure 6-8. Frequency with Which PA Contractors' Firms Conducted Audits and Performed Modeling Activities versus Another Firm**



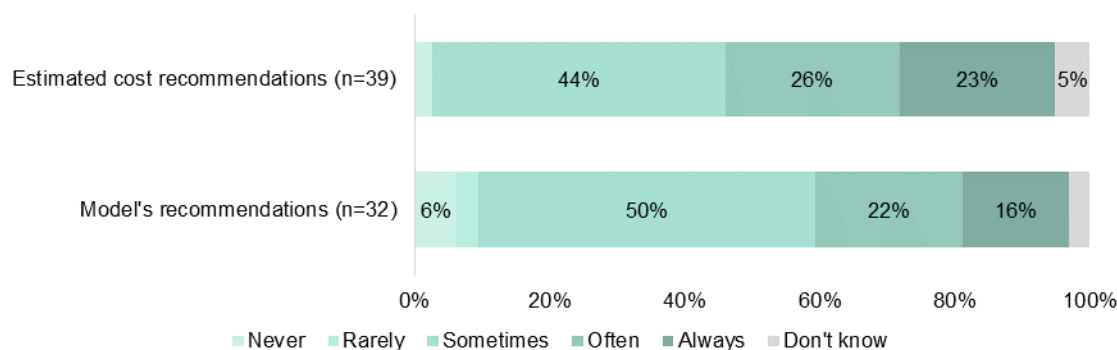
Fewer than one-fifth (19%) of the 126 NYS market actors who had estimated installed costs and energy savings indicated that building owners always accepted their results (Figure 6-9). A slightly smaller percentage (13%) of the 97 NYS market actors who provided modeled energy savings indicated that multifamily existing building owners always accepted the recommendations that resulted from the model. These numbers were slightly larger in PA; 23% of market actors reported that the owner always accepted the estimated cost recommendations and 16% reported that the owner always accepted the recommendations resulting from the energy model (Figure 6-10).

**Figure 6-9. Frequency with Which NYS Building Owners Accepted Recommendations from Estimated Costs and Model of Energy Savings<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables.

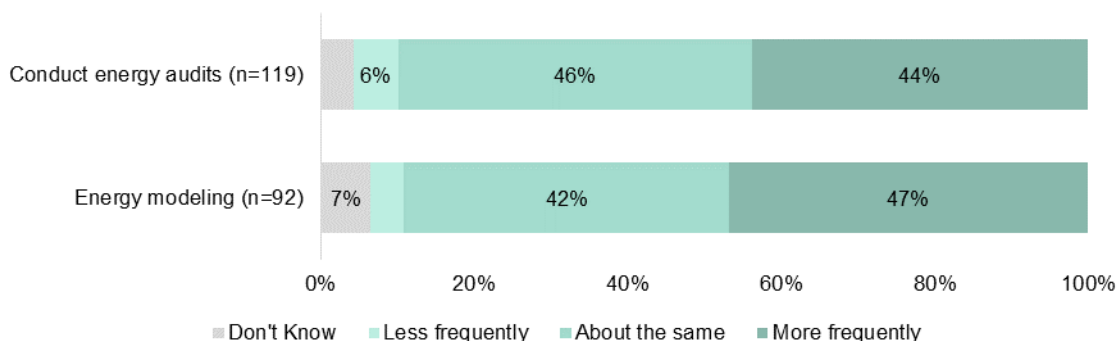
**Figure 6-10. Frequency with Which PA Building Owners Accepted Recommendations from Estimated Costs and Model of Energy Savings<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables

As shown in Figure 6-11, almost half (47%) of NYS market actors reported modeling energy usage more frequently than they did five years ago and 44% reported conducting audits more frequently for multifamily existing building projects. A greater percentage of downstate market actors (49%) reported conducting audits more frequently than they did five years ago than did the upstate market actors (36%).<sup>94</sup> In addition, NYS market actors who reported conducting audits more frequently were significantly more likely to be aware of MPP.<sup>95</sup>

**Figure 6-11. Frequency with Which NYS Market Actors Modeled Energy Usage and Conducted Audits, Compared to Five Years Ago<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables.

Of the 52 NYS market actors who reported conducting audits more frequently on existing building projects, the most common reasons were “increasing codes and regulations” (27%), followed by clients’ interests (17%). The most common reasons reported by the 43 NYS market actors who increased the frequency of developing energy savings models were “increasing codes and regulations” (23%) and an increased interest

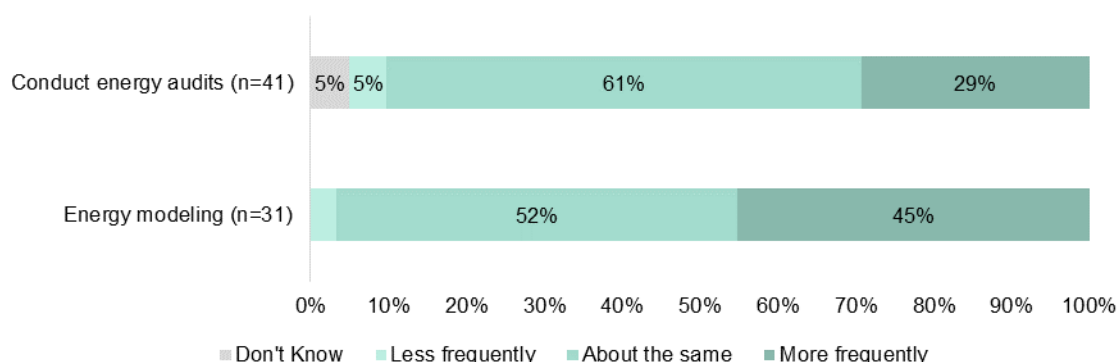
<sup>94</sup> Statistical comparisons were not permitted due to low cell counts for each group.

<sup>95</sup>  $p \leq .05$ .

in energy efficiency from clients (23%). A slightly smaller percentage of upstate market actors (19%) than downstate market actors (31%) indicated that “increasing codes and regulations” was a reason they began to conduct audits more frequently.<sup>96</sup>

A smaller percentage of PA market actors reported conducting audits more frequently (29%) than they had in the previous five years, which is less than the 44% of NYS market actors that made this observation (Figure 6-12). However, about the same percentage in PA (45%) and in NYS (47%) reported modeling energy usage more frequently during the previous five years (Figure 6-12). Of the 142 PA market actors who reported conducting audits more frequently on existing building projects, the most common reasons were clients’ interests (33%) and financial incentives (17%). Of the 14 PA market actors who said they develop energy savings models more frequently than in the previous five years, the most common reasons were “increasing codes and regulations” (21%) and a general interest in “going green” from clients (21%).

**Figure 6-12. Frequency with Which PA Market Actors Modeled Energy Usage and Conducted Audits, Compared to Five Years Ago<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables.

## 6.5 Analysis of Market Actors Combined with MPP Partners

MPP Partners were not included in the market actor analyses above because each group was interviewed using separate questionnaires with different questions and topics. However, one topic was discussed with both Partners and market actors that permits a comparison: providing comprehensive ERP-like services to non-MPP multifamily clients. The PE/MCA team interviewed half of the 24 Partners screened from the market actor lists, and six of these Partners (50%) reported providing comprehensive ERP-like services to non-MPP multifamily clients. The PE/MCA team also found that 23 of 224 NYS market actors and 11 of 93 PA market actors provided ERP-like services often or always to their multifamily (new construction or existing building) clients.

<sup>96</sup> Statistical comparisons were not permitted due to low cell counts for each group.

The PE/MCA team employed two methods to add Partners to NYS market actors to calculate a baseline percentage of those who provided ERP-like services to multifamily clients, and to compare with PA. First, the percentage of Partners who provided ERP-like services (50%) was extrapolated to all 24 Partners without the use of weights to account for level of Partner experience and activity. The result is 12 of 24 Partners who provided ERP-like services before becoming a Partner, and this is likely an overestimate since it assumes that Partners not interviewed were similar to those interviewed, regardless of varying levels of experience and activities in MPP. Second, the percentage of Partners who provided ERP-like services was extrapolated to all 24 Partner using weights to account for level of Partner experience and activities. The weights were used since the PE/MCA team interviewed more of the most experienced and active Partners and less of the least experienced and active Partners. With weights, the result is nine of 24 Partners who provided ERP-like services before becoming a Partner, which is likely an underestimate since it assumes that none of the Partners without MPP experience provided ERP-like services to multifamily projects. Thus, the PE/MCA team expects the true value to be in between these two estimates.

As shown in Table 6-18, excluding Partners, 10% of NYS market actors reported providing ERP-like services to most of their multifamily projects, and these market actors accounted for six percent of projects reported by all market actors. Including Partners, between 13% and 14% of NYS market actors provided ERP-like services to multifamily projects, and these market actors accounted for 19% of all projects. In PA, 12% percent of market actors reported providing ERP-like services, and these market actors accounted for 21% of all multifamily projects reported in PA.

**Table 6-18. Percentage of Market Actors in NYS (including MPP Partners) and PA Who Provided ERP-like Services to Multifamily Projects**

Sample	NYS (excluding Partners)	NYS (including Partners)	PA
Provided ERP-like services to multifamily projects (unweighted Partners)	10% (23/224)	14% (35/248)	12% (11/93)
Provided ERP-like services to multifamily projects (weighted Partners)	10% (23/224)	13% (32/248)	12% (11/93)
% of multifamily projects that received ERP-like services (with weighted Partners)	6% (335/2773)	19% (569/3007)	21% (210/1002)

## 6.6 Awareness of Incentive Programs

NYS market actors were asked about their awareness of utility incentive programs in the State, as well as NYSERDA Home Performance with ENERGY STAR, NYSERDA New Construction, and NYSERDA MPP (Table 6-189 and Table 6-1920). PA market actors were asked about their awareness of utility incentive programs and government incentive programs in PA (Table 6-2121).

**Table 6-19. NYS Market Actor Awareness of Incentive Programs, by Region<sup>a</sup>**

Program	Downstate New York (n=230)	Upstate New York (n=111)	NYS Total (n=341)
Utility incentive programs	57%	66%	60%
NYSERDA Home Performance with ENERGY STAR	67%	82%	72%
NYSERDA New Construction Program	57%	74%	62%
NYSERDA MPP	49%	62%	53%

<sup>a</sup> See Appendix B for significance tables.

**Table 6-20. NYS Market Actor Awareness of Incentive Programs, by Business Type<sup>a</sup>**

Program	Architect/Engineers (n=184)	Contractors (n=95)	EE Consultants (n=62)
Utility incentive programs	59%	47%	84%
NYSERDA Home Performance with ENERGY STAR	76%	57%	82%
NYSERDA New Construction Program	65%	50%	73%
NYSERDA MPP	52%	43%	73%

<sup>a</sup> See Appendix B for significance tables.

In NYS, about half or more of the market actors reported being aware of each program. Levels of awareness varied per program. From highest to lowest, they were NYSERDA Home Performance with ENERGY STAR, NYSERDA New Construction, utility incentive programs, and NYSERDA MPP.<sup>97</sup> Awareness of NYSERDA Home Performance with ENERGY STAR,<sup>98</sup> NYSERDA New Construction,<sup>99</sup> and NYSERDA MPP<sup>100</sup> were significantly greater in upstate than in downstate NYS (Table 6-18). Awareness of all programs was significantly greater among EE consultants than contractors (Table 6-19), but the trends in awareness across the programs within each region and firm type were the same as for the whole State.

In addition, about half of PA market actors reported being aware of utility and state government energy efficiency incentive programs. This was higher for EE consultants than for architects/engineers or contractors (Table 6-20).

<sup>97</sup> It should be noted that the survey did not randomize the order in which these programs were presented, which could have affected the level of awareness reported; programs were presented in the order shown in Table 6-18, Table 6-19, and Table 6-21.

<sup>98</sup>  $p \leq .001$ .

<sup>99</sup>  $p \leq .001$ .

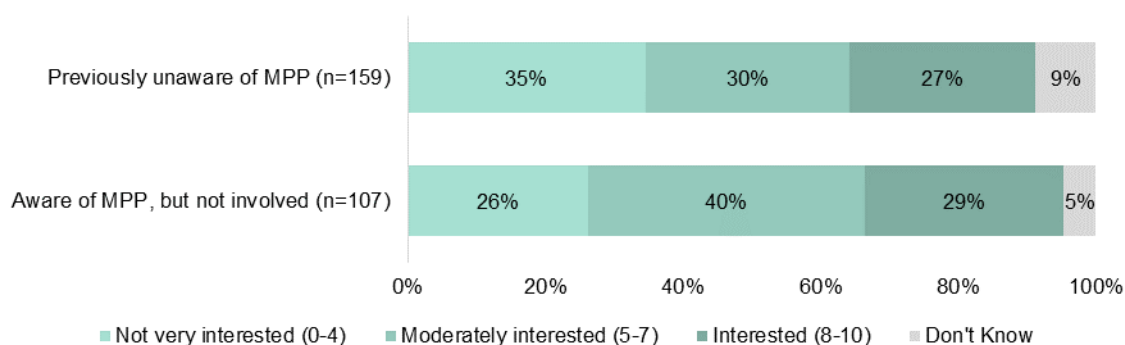
<sup>100</sup>  $p \leq .05$ .

**Table 6-21. PA Market Actor Awareness of Incentive Programs, by Business Type<sup>a</sup>**

Program	Architect/ Engineers (n=89)	Contractors (n=29)	EE Consultants (n=9)	PA Total (n=127)
Utility incentive programs	55%	52%	78%	56%
PA state government incentive programs	48%	48%	67%	50%

<sup>a</sup> See Appendix B for significance tables.

Market actors who reported being unaware of MPP were provided a brief overview of the program and asked how interested they were in becoming an MPP Partner (0-to-10 scale, in which “0” means “not at all interested” and “10” means “extremely interested.”). More than one-fourth (27%) of these NYS firms reported a high level of interest (from “8” to “10”) in becoming a Partner (Figure 6-13), with no differences between market actor groups.

**Figure 6-13. Interest in Becoming a MPP Partner**

Market actors in downstate NYS were slightly more interested in becoming a partner (34%) than were those in upstate NYS (18%). When asked to explain their response, the 43 respondents who were highly interested most commonly said they were interested in learning more about the program (28%) and that they were interested in increased energy efficiency/savings (21%). Of the 52 respondents who were not very interested (scored between “0” and “4”), the most common reason they gave for their lack of interest was that it was not what they do or they did not need to be a Partner (64%).

Among NYS respondents who already were aware of MPP but had not yet been involved in an MPP project, almost one-third (29%) expressed high interest in becoming an MPP Partner (between “8” and “10”; Figure 6-13); there were no differences between regions or market actor groups. The 31 respondents who said their firm was interested in becoming a Partner most often explained that being a Partner would broaden their client base (36%) and that they were interested in increasing energy efficiency and energy savings in the market (26%). Of the 26 respondents who were not very interested (a rating of between “0”

and “4”), the most common reason they gave was that energy efficiency was not their firm’s focus, or not what they do (57%).

Market actors who had been involved in an MPP project also were asked how much consideration they had given to becoming an MPP Partner (0-to-10 scale, in which “0” meant “no consideration” and “10” meant “lots of consideration”). On average, these firms gave only moderate consideration (mean=5) to becoming a Partner, and there were no differences by region. Contractors<sup>101</sup> and EE consultants<sup>102</sup> were more likely to report a greater level of consideration (score of “8” to “10”) than were architects/engineers. When asked to explain their responses, those who gave high ratings most often said they already participated in MPP (33%). Those who had given little to no consideration (score of “0” to “4”) to becoming a Partner most often said this was because it was not in their focus area or the kind of work they do (45%).

The PE/MCA team also asked NYS market actors who said they were aware of MPP how they first learned about the program. As shown in Table 6-22, market actors most often reported learning of MPP through another market actor firm (21%) or through a website/Internet not sponsored by NYSERDA (12%). NYSERDA-affiliated websites (9%), people (8%), or activities (5%) were not mentioned frequently as sources of awareness for MPP.

**Table 6-22. Responses of Market Actors When Asked How They First Learned of MPP**

Response	Percent
Another building professional or contractor firm	21%
Website/Internet	12%
A consultant	9%
Conference/seminar/meeting (no mention of NYSERDA)	9%
NYSERDA website	9%
NYSERDA representative	8%
A client	6%
Publications/bulletins	6%
Professional organization	5%
Mail/email	5%
NYSERDA conference/seminar/meeting	5%
Knowledge of the industry	4%
Word of mouth/an associate/friend	4%
Other miscellaneous mentions	4%
Aware of/have worked with NYSERDA	6%
NYSERDA (unspecified)	2%

<sup>101</sup>  $p \leq .05$ .

<sup>102</sup>  $p \leq .05$ .

## 6.7 Involvement in MPP and Market Effects

Of the NYS market actors who were aware of MPP, 75 (41%) reported having been involved as subcontractors (not as Partners) in multifamily projects in the previous two years that were supported by MPP. This was 22% of all NYS market actors, both aware and unaware of MPP. Among market actors who reported involvement in MPP projects, 53 (71%) had been involved in a MPP multifamily new construction project and 57 (76%) had been involved in a MPP multifamily existing building project in the previous two years. Market actors reported completing an average of five multifamily new construction projects in the previous two years that were supported by MPP; the average per market actor was nine.<sup>103</sup> However, the PE/MCA team cautions about the reliability of these figures since they are high relative to the total number of MPP projects (n=307) completed between November 2011 and November 2013.<sup>104</sup>

The majority (80% of 67) of firms that had been involved in an MPP new construction or existing building project<sup>105</sup> said their Partners' contributions were valuable and the remaining 20% reported that they did not know if those contributions had been valuable.<sup>106</sup> When asked why, market actors who considered their Partners' contributions valuable most commonly said that Partners provided information, support, or guidelines (51%); Partners provided incentives or promotions (19%); and Partners helped firms increase their projects' energy efficiency and savings (8%). There were no differences between regions or firm types.

NYS market actors involved in MPP discussed how the program had changed their business. About one-third (35%) of market actors reported that MPP had not changed their business's multifamily sector activities; this finding was slightly higher for contractors and EE consultants than for architect/engineers. However, some firms did indicate that MPP changed their business in the following ways, it:

- Made them more knowledgeable of, or placed a greater emphasis on energy efficiency and savings (28% overall; slightly higher for architects/engineers and contractors).
- Increased business opportunities (12%).
- Saved money (5%).
- Increased workload (5%).

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<sup>103</sup> The PE/MCA team removed outliers who were more than three standard deviations from the mean.

<sup>104</sup> CRIS database, December 20, 2013.

<sup>105</sup> While 75 respondents said they had been involved in an MPP-supported multifamily project in the previous two years, when they were asked *how many* new construction or existing projects they had done in the previous two years that were supported by MPP, 67 reported having done at least one.

<sup>106</sup> One market actor said their Partner was not valuable "because they were superseded by other funding agencies that had more stringent requirements."



Market actors involved in MPP indicated that the program had been at least somewhat influential (on a 0-to-10 scale in which “0” means “not at all influential” and “10” means “very influential”) in their promotion of energy-efficient building design (mean 5.7, median 6) and energy-efficient measures (mean 5.8, median 6) in multifamily building projects. In addition, about half (51%) of these market actors indicated that the degree to which they promoted energy efficiency to multifamily building clients had increased due to their involvement in MPP. Slightly fewer (44%) reported that the degree to which they promoted energy efficiency to non-multifamily residential clients also had increased, and substantially fewer (27%) reported that the degree to which they promoted energy efficiency to non-multifamily commercial clients had increased. There were no differences between regions or firm types.

As Table 6-23 shows, market actors who had participated in MPP were more likely to provide new building construction<sup>107</sup> and installation of equipment<sup>108</sup> services. Conversely, firms that had not participated in MPP had a greater percentage of market actors who provided retrofit and new building architectural design.

**Table 6-23. Multifamily Services Offered by Market Actors Who Had Participated in an MPP-supported Project and those Who Had Not (n=182)<sup>a</sup>**

Service Offered	Participated in MPP (n=75)	Had Not Participated in MPP (n=86)
Installation of equipment	39%	24%
New building construction	75%	61%
Project oversight	83%	70%
Whole-building energy modeling	36%	29%
Retro-commissioning services	36%	30%
LEED building design	40%	37%
Building or system energy audits	40%	38%
Renovation/remodeling	75%	74%
New building engineering design	40%	41%
Retrofit engineering design	47%	50%
New building architectural design	36%	44%
Retrofit architectural design	41%	55%

<sup>a</sup> See Appendix B for significance tables.

<sup>107</sup>  $p \leq .10$ .

<sup>108</sup>  $p \leq .05$ .

Market actors also were asked how valuable it would be to have a source of energy efficiency information in their state that is not connected to the sales of energy efficiency measures on a 0- to-10 scale in which “0” means “not at all valuable” and “10” means “extremely valuable.” On average, market actors placed a moderately high value on having an “independent” source of energy efficiency information in their state (mean = 7.5 median = 8 for downstate NYS, mean 7.2 median =8 for upstate NYS and PA). In NYS, 60% of market actors indicated that this was very valuable to them (score of “8” to “10”); more than half (51%) of PA market actors indicated that this was very valuable.<sup>109</sup>

The majority (82%) of NYS market actors said they had noticed multifamily developers, owners, or managers increasing their effort to make their buildings more energy-efficient. This is moderately lower in PA (76%) compared to NYS, and no other differences were found.<sup>110</sup> The most common explanations NYS and PA firms gave regarding why multifamily developers were increasing their efforts to make their buildings more efficient were to achieve greater energy savings (26% in NY, 22% in PA) and cost savings (19% in NY, 17% in PA).

Over half (56%) of NYS market actors who said they had observed increased energy efficiency efforts in the market also reported that this shift had increased the amount of multifamily energy efficiency work they did in their state. This was significantly higher for contractors (64%)<sup>111</sup> and EE consultants (69%)<sup>112</sup> than for architects/engineers (47%) in NYS. Almost half of these firms (49%) started providing or recommending new technologies to meet the increased interest, and this effect was significantly higher in downstate NYS (54%) than in upstate NYS (36%) and PA (32%).<sup>113</sup> In addition, EE consultants (69%) were more likely to comment on this change than were contractors (48%) or architects/engineers (39%) in NYS.<sup>114</sup> Of those who reported providing new technologies to address this increased interest, the most common types of new technologies were improved air conditioning equipment (17%), improved lighting (16%), and modeling tools or software (13%).

Of the NYS firms that had been in the field at least five years, one-quarter stated that the percentage of their State employees engaged in multifamily energy efficiency work had increased in the previous five years (Figure 6-14). The majority of NYS firms (68%) reported that the number of their employees in the multifamily energy efficiency arena had remained the same during the previous five years, while 5% of these indicated a decrease in multifamily employees. There were no differences by region or firm type. By comparison, a lower percentage of market actors with PA firms said the number of their employees

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<sup>109</sup>  $p \leq .10$ .

<sup>110</sup>  $p \leq .10$ .

<sup>111</sup>  $p \leq .05$ .

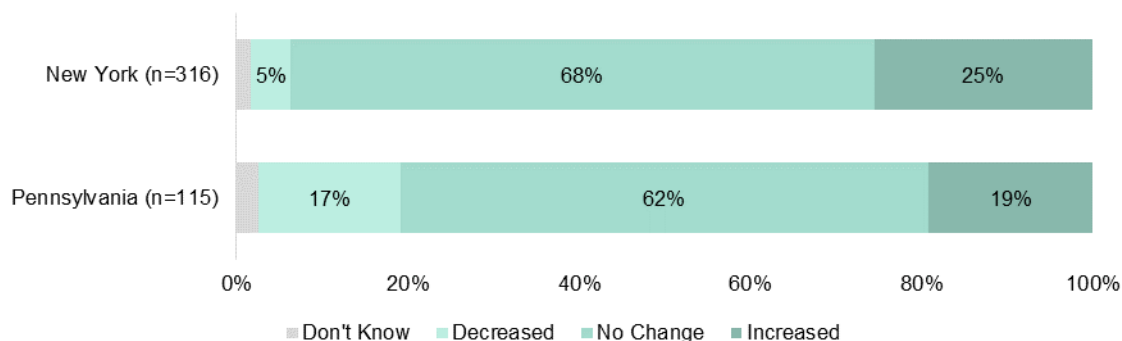
<sup>112</sup>  $p \leq .05$ .

<sup>113</sup>  $p \leq .05$ .

<sup>114</sup>  $p \leq .05$ .

engaged in multifamily energy efficiency work had increased (19%) or stayed the same (62%), while significantly more (17%) indicated a decrease in multifamily employees during the previous five years (Figure 6-14).<sup>115</sup>

**Figure 6-14. Change in Employee Engagement in Multifamily Energy Efficiency Work in Previous Five Years<sup>a</sup>**



<sup>a</sup> See Appendix B for significance tables.

## 6.8 Conclusions

One of the objectives of this market actor study was to establish a baseline of the percentages of market actors providing energy-efficiency services in the multifamily sector in NYS, and to compare these percentages to those found in PA, a state in the same climate zone but with much less extensive offerings of multifamily energy efficiency programs compared to NYS. A second goal of the survey was to measure market actors' awareness of and involvement in MPP, as well as the effects MPP might be having on market actors' services in the NYS multifamily sector. The approach and sample were flawed so that neither of these goals was accomplished. The Dodge data used appears to not be a good source for potential Partners and may exclude a portion of market actors who provide or could provide ERP-like services. This study recommends that another survey that uses a broader list of market actors be fielded in next round of evaluations.

The PE/MCA team found that between one-third and two-thirds of the NYS market actors who were contacted for this evaluation were providing services in the multifamily sector, which was significantly higher than in PA. In addition, on average, more market actors in upstate NYS worked in the multifamily sector than did those who served primarily the downstate market even though there are more market actors working downstate overall.

Across all regions and business types, the percent of respondents that provided MPP Partner-like services in new construction and existing building projects was low. Only four percent of NYS market actors

<sup>115</sup>  $p \leq .001$ .

reported always recommending all the energy-efficient measures and providing an energy model in their multifamily new construction projects. These numbers were slightly greater for NYS market actors than for PA market actors and for market actors in upstate NYS than for downstate market actors. In addition, five percent of NYS market actors reported always addressing all the energy-efficient measures and performing all the energy audit activities in their multifamily existing building projects. These percentages were slightly lower for NYS market actors than for those in PA, and were higher for those in upstate NYS than in downstate, and for EE consultants than for architects/engineers and contractors in both states.

In NYS, the amount of market actors that are providing Partner-like services in new construction and existing building projects appears to be increasing in the past five years. About half of the NYS market actors reported recommending energy-efficient measures and conducting an energy model in multifamily new construction projects more frequently than they did five years ago. This increase was due mostly to clients' growing emphasis on energy savings, energy efficiency, and cost savings. For existing buildings, slightly fewer than half of NYS market actors reported conducting an energy audit or performing an energy model in more frequently than they had five years ago. This increase was due mostly to changing codes and regulations, and clients' interests in energy efficiency.

However, the percentage of NYS market actors who provided MPP Partner-like services to their multifamily projects was slightly higher when the 24 MPP Partners who were screened from the survey were included in analyses. Between 13% and 14% of NYS market actors, including Partners, provided ERP-like services to most of their multifamily projects, compared to 12% in PA.

At least half or more of NYS market actors reported being aware of NYS utilities' energy efficiency programs and NYSEDA's programs, including MPP (53%). Market actors who were aware of MPP reported learning about the program most often from another building professional or contractor, or through a website or the Internet. In addition, slightly more than one-fourth of market actors reported a high level of interest in becoming an MPP Partner.

Overall, MPP appears to have some positive influences on those market actors who have been involved in an MPP-supported project. Twenty-two percent of all NYS market actors, and 41% of those who were aware of MPP, reported having at least one multifamily project supported by MPP. A large majority (80%) found their MPP Partner's contributions valuable and one-third reported giving a high level of consideration to becoming an MPP Partner. About one-fourth of market actors reported that MPP had made them more knowledgeable about and increased their interest in emphasizing energy efficiency and savings in their projects. Twelve percent said that MPP increased their business opportunities, and 5% reported that MPP had helped them save money and increase their workload.

Market actors also noted that MPP had been at least somewhat influential in their promotion of energy-efficient building design and measures. About half had increased their promotion of energy efficiency to their multifamily clients due to their participation in MPP; 44% increased their promotion of energy

efficiency to non-multifamily residential clients and 27% increased promotion to non-multifamily commercial clients. In addition, market actors involved in at least one MPP project said they installed equipment and provided new building construction services more frequently than those who had not been involved in MPP.

In general, both NYS and PA market actors have noticed growing interest in EE within the multifamily sector. A large majority of the market actors in NYS (82%) and PA (76%) said that a growing number of building owners were trying to make their buildings more efficient. The most common reasons for this shift were energy and cost savings. About half of the NYS market actors said this change had increased the amount of multifamily energy-efficient work they did in the State. Nearly half of these market actors had begun to offer/install new technologies, such as improved air conditioning sources, improved lighting, and modeling tools or software. In addition, one-fourth of the market actors in NYS and 19% of those in PA reported increasing the number of employees doing multifamily energy efficiency work in the past five years.



## 7 Participant Surveys

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### 7.1 Introduction

#### 7.1.1 Research Objectives

This chapter describes findings from in-depth interviews (IDI) conducted with primary contacts from 110 recent MPP projects. Interviews with these participants addressed the following research objectives:

- Assess participants' knowledge of energy efficiency and program services.
- Document Partner's role in MPP projects.
- Assess communication between participants, program staff, and Partners.
- Document participant processes for accessing financing options.
- Assess participant satisfaction with and perceived value of the program.
- Identify challenges encountered throughout the program process.
- Determine a baseline for Partner services.

#### 7.1.2 Data Collection and Analyses

The PE/MCA team used the CRIS database to create a participant sampling frame. Because records in the CRIS database for each MPP project include multiple associated parties and do not specify which company or individual was most involved in the MPP process, the PE/MCA team created a sample frame that included multiple companies and contacts for each project. Thus, sampling and data collection included identifying the actual "participant," or the person and company that was most actively involved in the MPP process. Working with program staff, the PE/MCA team identified the following company types as "potential participants": developer/owner, project contact, managing agency, participant/company, and property owner.<sup>116</sup>

The PE/MCA team divided the participant list between the PE/MCA team and Impact team so that no participant was contacted twice. The Impact team needed to speak with contacts at projects with enough post-installation data to be able to do a billing analysis. Thus, all projects that had completed an ERP before January 1, 2012, were assigned to the Impact team. Comparisons between participants interviewed by the

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<sup>116</sup> As these groups were part of other evaluation survey efforts, the PE/MCA team excluded the following company types from the sampling frame query: Multifamily Performance Partner, engineering firm, architectural firm, and technical service provider.

PE/MCA and Impact teams were possible for a few survey questions, and are noted in the applicable analyses below.

The PE/MCA team queried all remaining version 4 and version 5 projects that had at least signed the participation agreement by the date of the query (August 27, 2013). This included all potential participants (and their contact information) for each project. The resulting sample frame included 400 MPP projects, 354 companies, and 360 contacts.

The unit of analysis was a participant company, and the interview guide primarily asked questions about a single project. However, many participating companies were associated with more than one project. Since participants were eligible to complete only one survey (although they may have had multiple projects), the PE/MCA team constructed a dynamic call list that identified all duplicate entries of a contact or a company. The result was 261 unique project company contacts.

Initially, the PE/MCA team sought to complete interviews with 113 participants. Interviewers attempted to reach each contact a maximum of five times. During the interview process, the PE/MCA team screened out any potential respondents who indicated they were not the appropriate contact for the project. Because of these difficulties in reaching project contacts, the PE/MCA team exhausted the call list before reaching the target quota. Ultimately, the PE/MCA team conducted IDIs by telephone with 110 participants (from a list of 261) from September 2013 through December 2013. The resulting response rate was 42%, achieving a confidence/precision that exceeds 95/10.<sup>117</sup>

The PE/MCA team used screening questions to identify the appropriate party to interview (Appendix A). Once the PE/MCA team reached the appropriate contact, the contact identified a specific project for which the application was submitted and accepted in 2012 or later to be the focus of the interview (preferably their most recent project, if applicable).

An abbreviated version of the interview guide was available for participants who were unable to complete the full version. The shortened version included a set of questions from the longer version determined to be high-priority topics: the primary research objectives and collected information regarding potential market effects of MPP. Questions that appeared only in the long version of the survey are identified throughout

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<sup>117</sup> Given that: a) only one company per project was eligible to complete the interview, b) only one person per company was eligible to complete an interview, and c) only one project per company was eligible to be interviewed, the PE/MCA team employed advanced de-duplication techniques to determine the number of unique “project company contacts.” The result was 261 project company contacts, excluding those flagged as Impact contacts (N=285 including those flagged as Impact contacts). Considering the sampling approach, the PE/MCA team used this number as the population *N* when calculating response rate and sampling confidence/precision. The response rate was calculated by dividing the number of completed interviews (n=110) by the number of unique project company contacts that were not also on the Impact Team’s list (N=261). Exact confidence/precision was 95/7.3.



this chapter. The PE/MCA team conducted the shortened version of the interview with 26 (24%) of the respondents.

Data analysis occurred in two phases. First, the PE/MCA team coded participants' open-ended responses to create representative categorical variables to be analyzed using quantitative methods. Next, the PE/MCA team conducted quantitative analyses on all variables, which included calculating frequencies and comparing responses across variables of interest. Comparison variables are found in Table 7-1 and are described in detail in the participant characteristics section (Section 7.2). Statistically meaningful differences ( $p \leq .10$ ) are reported throughout the chapter.

## 7.2 Participant Characteristics

### 7.2.1 Comparison Variables

This chapter explores whether participants' experiences in MPP differed as a function of which MPP programs and paths the project followed, the characteristics of the project, the firms' level of experience working with multifamily buildings, and which firm served as the project's Performance Partner. Table 7-1 provides a summary of each comparison variable used in the analyses and the source of the data (CRIS database and/or participant interviews).<sup>118</sup> For categorical variables, the table includes the number and proportion of projects within the sample that fall into each category, as well as the number and proportion of projects from the overall population of projects that were eligible to be the focus of the interview (projects in the call list sampling query plus all projects for which the participation agreement was signed after the date of the query until the date of the last participant interview). For the continuous variable (project number of units), the table provides sample and population means. A comparison of the eligible population and interview sample revealed that the interview sample contained a greater proportion of upstate properties than was found in the overall population of eligible participants,<sup>119</sup> but there were no other significant differences between groups.

It is important to note that there are many relationships between the comparison variables themselves, such that there are frequency and mean differences across groups. Table 7-2 includes a summary of the relationships between all comparison variables; significant relationships are presented in bold font.

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<sup>118</sup> Some questions in the survey applied only to new construction or existing building projects, and participants were asked which type of project they had so the interviewer could ask them the appropriate questions. The PE/MCA team found discrepancies between the CRIS database and the information interviewees shared during the phone interview. Ten participants who categorized their project as an existing building project during the interview are listed as new construction in the CRIS database. The PE/MCA team chose to use the CRIS categorization in the analyses. Thus, responses are missing from the 10 participants who self-categorized as existing building projects for any question that was asked only to participants with new construction projects.

<sup>119</sup>  $p < .10$ ,  $\lambda$  (lambda)  $\leq .20$  (weak relationship).

**Table 7-1. Firm/Project Comparison Variables Used in All Analyses**

Variable	Source	Type	Levels	Sample		Population	
				Number	Percent	Number	Percent
Building type <sup>a</sup>	CRIS	Categorical	New Construction	46	43%	179	36%
			Existing Building	62	57%	314	64%
Market type <sup>a</sup>	CRIS	Categorical	Affordable	83	77%	345	70%
			Market Rate	25	23%	148	30%
Path (new construction projects) <sup>a,b,c</sup>	CRIS	Categorical	Performance	43	93%	167	93%
			Prescriptive	3	7%	12	7%
Path (existing building projects) <sup>b</sup>	CRIS	Categorical	Standard	57	92%	281	89%
			Fast Track	5	8%	33	11%
Region <sup>d</sup>	Interview	Categorical	Downstate	77	70%	386	78%
			Upstate	33	30%	107	22%
Units leased or owned <sup>e</sup>	CRIS, Interview	Categorical	Leased	48	71%	256	73%
			Owned	20	29%	94	27%
First time working with MPP <sup>f</sup>	Interview	Categorical	Yes	62	58%	—	—
			No	44	42%	—	—
Has one New York State property <sup>g</sup>	Interview	Categorical	Yes	26	24%	—	—
			No	84	76%	—	—
Worked with the Predominant Partner <sup>h</sup>	Interview	Categorical	Yes	35	32%	—	—
			No	75	68%	—	—
Variable	Source	Type		Number	Mean	Number	Mean
Project number of units	CRIS	Continuous		110	160.3	493	154.3

<sup>a</sup> Data for two properties were not found in CRIS database.

<sup>b</sup> Frequencies were calculated with new construction projects or existing projects only.

<sup>c</sup> Due to the low number of participants in the Prescriptive and Fast Track paths, the PE/MCA team was unable to test reliably for differences as a function of these variables.

<sup>d</sup> Region was determined using the project's address.

Continued

- <sup>e</sup> Due to a large proportion of missing data in CRIS, the PE/MCA team coded projects as “owned” if contacts described their property as a cooperative/condominium during the interview.
- <sup>f</sup> Four participants provided a “Don’t know” response.
- <sup>g</sup> Participants taking part in MPP for the first time who reported having no other properties in New York State are those categorized as having only one property in New York State.
- <sup>h</sup> The most productive (“Predominant”) Partner accounted for a large proportion of the projects in the sample and is treated as a different class of Partner from the rest. See the Comparison variables section (7.2.1) for more information.

**Table 7-2. Significant Frequency or Mean Differences across Comparison Variables**

Variable	Level	Market type		Region		Units leased or owned		First time working with MPP		Has one New York State property		Worked with Predominant Partner		Project Number of Units (Mean)	
		Afford.	Market	Down.	Upstate	Leased	Owned	Yes	No	Yes	No	Yes	No		
Proportion of Participants within Each Quadrant															
Building type	New	41%	2%	37%	6%	12%	3%	19%	23%	4%	39%	30%	13%	70.9	
	Existing	36%	21% <sup>c,d</sup>	33%	24% <sup>c,d</sup>	59%	26%	39%	18% <sup>b,d</sup>	20%	37% <sup>c,d</sup>	3%	55% <sup>c,f</sup>	226.7 <sup>c</sup>	
Market type	Affordable				49%	28%	65%	1%	41%	36%	10%	67%	31%	45%	139.2
	Market Rate				21%	2% <sup>c,d</sup>	6%	28% <sup>c,f</sup>	17%	6% <sup>a,d</sup>	14%	9% <sup>c,e</sup>	1%	22% <sup>c,d</sup>	230.4 <sup>a</sup>
Region	Downstate						37%	28%	36%	33%	16%	54%	31%	39%	191.0
	Upstate						34%	1% <sup>c,d</sup>	23%	8% <sup>b,d</sup>	7%	23%	1%	29% <sup>c,d</sup>	87.5 <sup>c</sup>
Units leased or owned	Leased								45%	26%	15%	56%	12%	59%	232.7
	Owned								29%	9%	18%	12% <sup>c,d</sup>	3%	26%	175.7
First time working with MPP	Yes										25%	34%	16%	42%	237.5
	No										0%	42% <sup>c,e</sup>	14%	27%	317.0
Has one NYS property	Yes											31%	45%	134.9	
	No											1%	23% <sup>c,d</sup>	302.6	

<sup>a</sup>  $p \leq .10$ .

<sup>b</sup>  $p \leq .05$ .

<sup>c</sup>  $p \leq .01$ .

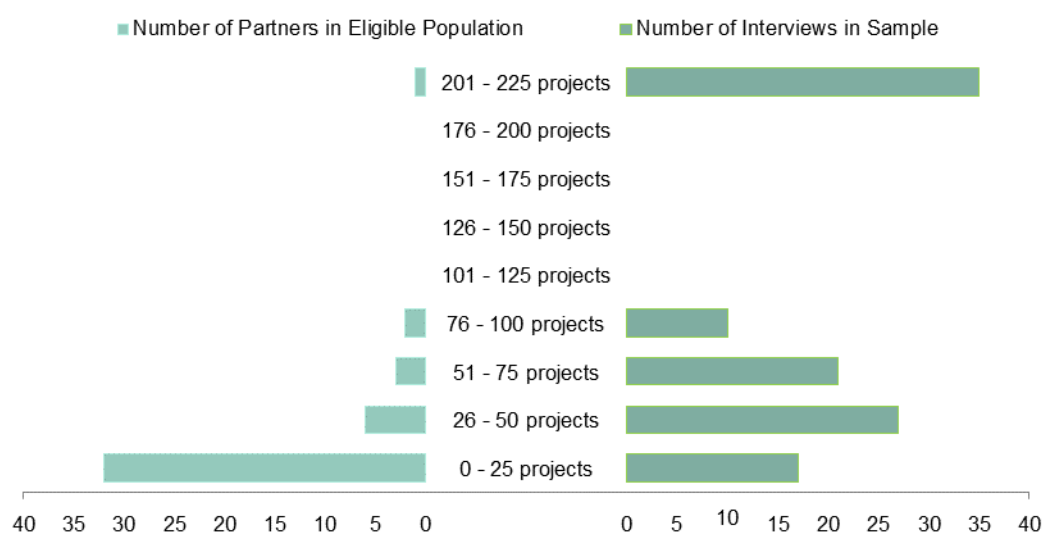
<sup>d</sup>  $\lambda$  (lambda)  $\leq .20$ . (weak relationship).

<sup>e</sup>  $20 \leq \lambda$  (lambda)  $< .40$  (moderate relationship).

<sup>f</sup>  $\lambda$  (lambda)  $\geq .40$  (strong relationship).

The PE/MCA team examined whether Partners' experience in MPP affected participants' experiences in the program. The measure of Partner experiences used in this report is the number of MPP projects completed by the Partner. Initial descriptive and exploratory analyses revealed that this variable is significantly skewed because one Partner (hereafter referred to as the "Predominant Partner") has conducted more than twice as many jobs as the next most productive Partner and accounts for one-third of the projects in the sample. The left side of Figure 7-1 depicts the distribution of Partners who worked with projects in the eligible population across levels of experience, and the right side depicts the distribution of interviewed participants who worked with Partners of a given experience range.

**Figure 7-1. Distribution of Partners across Levels of Experience and Distribution of Interviewed Participants Working with Partners of a Given Experience Level**



Because the Predominant Partner accounted for such a large proportion of the projects in the sample, they are treated as a different class of Partner from the others. Throughout the chapter, analyses examining the effects of Partner experience on participants' responses focus on whether or not participants worked with the Predominant Partner. Appendix C includes a detailed description of the analyses on this variable and the decision to focus on comparisons between the Predominant Partner and other Partners.

## 7.2.2 Other Contact and Firm Characteristics

The project contacts in the interview sample represent a range of company types and roles within those companies (Table 7-3). Leadership roles include owner, president, executive director, vice president, principal, partner, CEO, COO, principal, and cooperative board member. Management roles include area director/manager, property/project manager, and associate. Across company types and roles, contacts have spent an average of 7.5 years in their current role.

**Table 7-3. Company Type, Role in Company, and Mean Years in Role**

Company Type and Role	Percent Respondents In Role (N = 110)	Mean Number of Years In Role
Development firm: Leadership	13%	9.1
Development firm: Management	14%	5.0
Nonprofit/social service provider: Leadership	8%	13.2
Nonprofit/social service provider: Management	14%	5.3
Property management firm: Leadership	5%	7.2
Property management firm: Management	7%	5.0
Cooperative board member	8%	2.6
Building/construction manager	7%	10.6
Building owner (company): Leadership	5%	15.6
Building owner (LLC): Member	5%	2.8
Realty firm: Management	5%	9.7
Construction firm: Leadership or management	4%	5.8
Building owner (personal)	4%	23.0
Consultant	2%	3.0

When asked to describe all of the roles their firm plays at the MPP project property, 59% of firms manage the property, 51% serve as the developer, 50% are the sole owner of the property, and 26% are part of a group of cooperative owners.<sup>120</sup> Less than 10% of participants described their firm as part of a partnership in the project, as a builder or contractor, or as a nonprofit or special service provider.

Among the 16 contacts with existing building projects who do not manage the property, most (81%) reported that an outside firm manages the property.<sup>121</sup> Participants most often described project management firms as contributing to discussions about equipment upgrades and construction projects, but say they were not involved in the final decision-making about these issues.

About 40% of participants in the sample had worked with MPP before the project that was the focus of the interview. Of those, about half first participated in the program in 2008 or earlier (Table 7-4). There are a number of factors that may have contributed to the relatively high number of repeat participants in this sample. Because owner and management company names were used to search for overlap between the Impact sample and the participant interview sample, the PE/MCA team may have been unsuccessful in screening out companies that create new LLCs, and therefore new company names, for each project. Further, participants were asked to report on their most recent project during the interview, and some noted

<sup>120</sup> Multiple responses allowed.

<sup>121</sup> Long version only.

that they had multiple MPP projects underway concurrently and while the project that was the focus of the interview was not their first MPP project, their first project also began fairly recently.

**Table 7-4. Year of First MPP Project**

Year	n=44
2005 <sup>a</sup>	5%
2006 <sup>a</sup>	5%
2007	18%
2008	23%
2009	7%
2010	7%
2011	11%
2012	11%
Don't know	11%
No response	2%

<sup>a</sup> The 2005 program was the ENERGY STAR® Pilot of MPP, and the 2006 program was Phase 2 of the pilot.

## 7.2.3 Knowledge of and Experience with Efficiency Measures Prior to MPP Participation

### 7.2.3.1 Knowledge and Motivation

A primary objective of this analysis was to establish a baseline of pre-participation energy efficiency knowledge and behaviors. Participants answered a series of questions regarding their awareness and knowledge of energy efficiency opportunities and the degree to which they had pursued energy efficiency measures in their buildings prior to participating in MPP.

At the time of the interviews, less than one-third (30%) of participants was aware of the Building Performance Institute's (BPI) Multifamily Building Analyst certification, which is the building auditor certification held by many MPP Partners.

Among participants who have properties in New York State that have not gone through MPP (69% of the sample); two-thirds of them sought advice on energy upgrade options before becoming involved in MPP. Of those, one quarter sought advice from an energy consultant, 18% from an engineer or architect, and 16% sought advice from the firm that now serves as their MPP Partner. Table 7-5 provides a summary of all sources of energy efficiency information used before MPP participation.

**Table 7-5. Source of Energy Efficiency Information Prior to MPP Participation**

Source	n=49
Energy consultant	25%
Current MPP Partner	16%
Engineer/architect	18%
NYSERDA	10%
Other government organization or program	16%
Internal staff	14%
Utility	14%
Nonprofit organization	10%
Contractor	10%
Peer/colleague	6%
Conference	4%
Other	4%

Note: Multiple responses allowed.

Most participants (85%) had engaged in some sort of energy efficiency activity at a multifamily building before participating in MPP (Table 7-6). Over three-quarters had upgraded equipment in or aspects of a building to improve its energy efficiency and over half (53%) had developed a plan to reduce energy use. The proportion of participants who had engaged in a given activity decreased as the comprehensiveness and difficulty of the activity increased. Less than one-quarter of participants had performed whole-building energy modeling (23%) or pursued LEED certification (23%), for example. Participants who had worked with MPP on more than one occasion were three times more likely to have pursued LEED certification (34%) than were participants working with MPP for the first time (12%).<sup>122</sup> Participants who worked with the Predominant Partner also were more likely to have pursued LEED certification (39%) than participants working with other Partners (16%).<sup>123</sup>

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<sup>122</sup>  $p \leq .05$ .

<sup>123</sup>  $p \leq .05$ .

**Table 7-6. Energy Efficiency Activities Pursued Prior to MPP Participation**

Multiple responses allowed.

Activity	n=74
Any	85%
Upgraded equipment or aspects of the building for energy efficiency	77%
Developed a plan to reduce energy use	53%
Had an energy assessment or audit to identify opportunities to reduce energy use	47%
Benchmarked energy consumption	39%
Retrocommissioning to ensure optimal energy use performance	24%
Performed whole-building energy modeling	23%
Pursued LEED certification	23%

Participants with non-MPP properties rated their knowledge about how to reduce energy use in their buildings prior to participating in MPP on an 11-point scale of 0 (“not at all knowledgeable”) to 10 (“very knowledgeable”). Less than one-third of participants (31%) considered themselves to be “very knowledgeable” (a rating of “7” or higher; Figure 7-2). Participants with existing building projects rated themselves as more knowledgeable than participants with new construction projects,<sup>124</sup> upstate participants rated themselves as more knowledgeable than downstate participants,<sup>125</sup> and participants who worked with the Predominant Partner rated themselves as less knowledgeable than participants who worked with other Partners.<sup>126</sup>

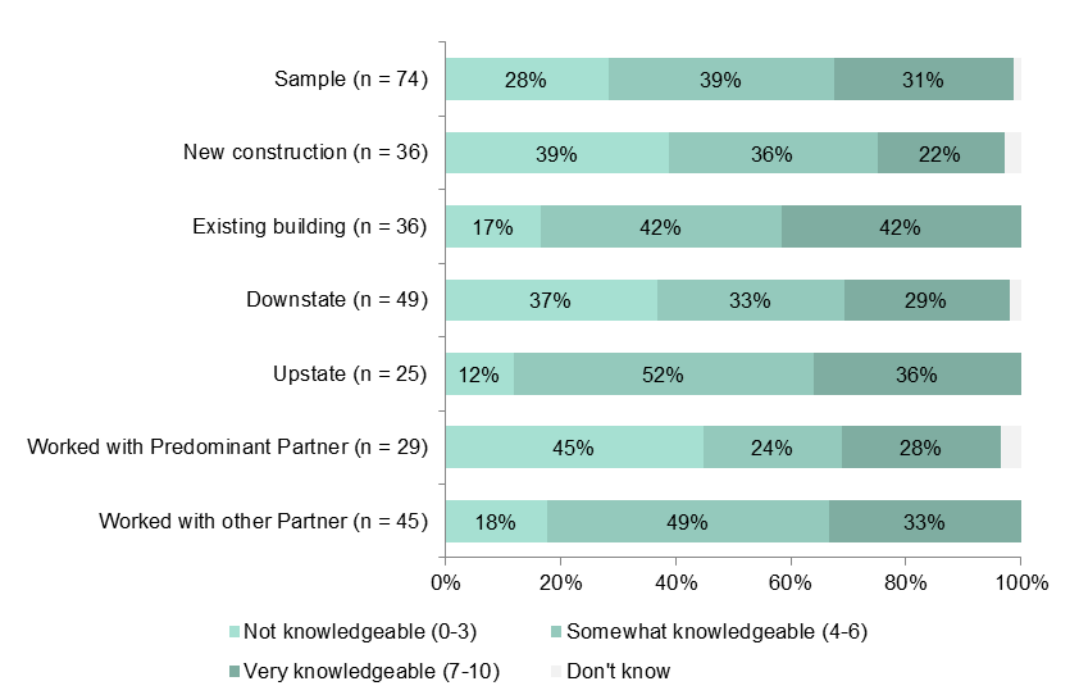
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<sup>124</sup>  $p \leq .01$ .

<sup>125</sup>  $p \leq .05$ .

<sup>126</sup>  $p \leq .10$ .



**Figure 7-2. Self-Rating of Energy Efficiency Knowledge Prior to MPP Participation**

Participants with new construction projects rated how inclined they were (not very, somewhat, or quite strongly) to construct a facility that was more energy-efficient than energy code required, and participants with existing building projects rated how strongly inclined they were to increase the facility's energy efficiency.<sup>127</sup> As shown in Figure 7-3, most participants (93%) reported that they were "somewhat" or "strongly" inclined to implement energy efficiency measures. Participants with existing building projects were more inclined to upgrade their facility than participants with new construction projects were to build a facility more efficient than code,<sup>128</sup> and participants with market rate projects were more inclined toward energy efficiency measures than were participants with affordable projects.<sup>129</sup>

<sup>127</sup> Long version only.

<sup>128</sup>  $p \leq .01$ .

<sup>129</sup>  $p \leq .10$ .

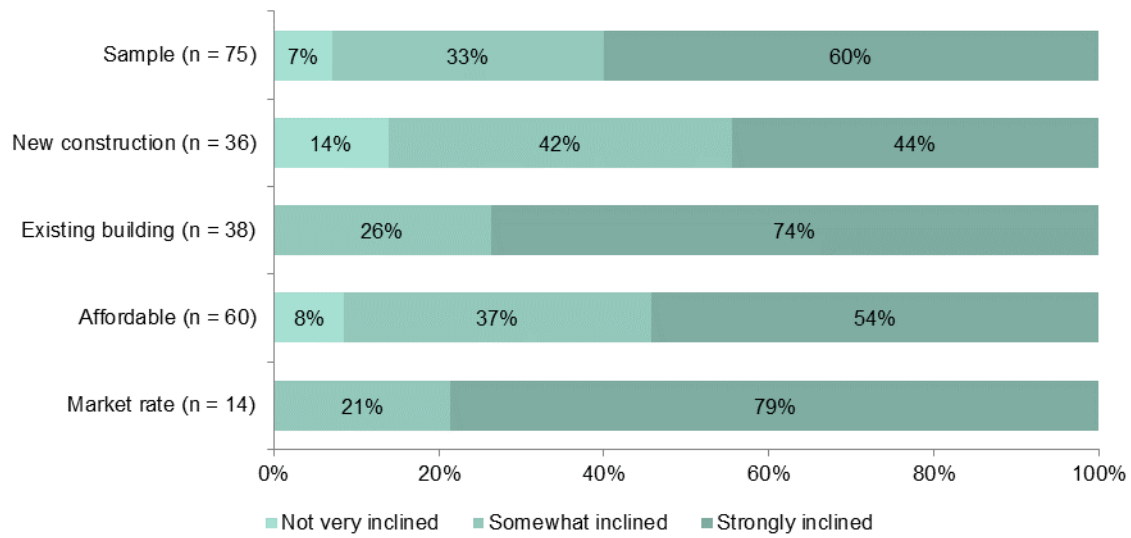
**Figure 7-3. Inclination toward Energy Efficiency Measures Prior to MPP Participation**

Table 7-7 provides a summary of the upgrades or measures participants considered before learning about MPP, as well as any significant differences between groups.<sup>130</sup> Significant differences are highlighted in bold.

<sup>130</sup> Long version only.

**Table 7-7. Energy Efficiency Measures Considered Prior to MPP Participation**

Measure	Sample (n=70)	Building Type		Region	
		New Construction (n=31)	Existing Building (n=38)	Downstate (n=54)	Upstate (n=16)
Heating & cooling: Boilers	43%	45%	39% <sup>c</sup>	46%	31%
Heating & cooling: Other	30%	0%	24%	28%	38%
Building envelope: Windows	33%	13%	45% <sup>b</sup>	26%	56% <sup>b</sup>
Building envelope: Other	41%	19%	42%	39%	50%
Lighting	34%	52%	34%	35%	31%
Domestic hot water	9%	32%	37%	7%	13%
Water conservation	14%	0%	16%	15%	13%
Alternative power sources	16%	16%	13%	20%	0%
Appliances	14%	19%	13%	15%	6%
Conversion to gas	13%	19%	11%	15%	13%
Mechanical systems	6%	13%	0%	7%	0%
Sustainable materials	4%	10%	0%	6%	0%
Green roof	3%	6%	0%	4%	0%
Other	7%	10%	5%	7%	6%
Don't know	4%	10%	0%	6%	0%

<sup>a</sup>  $p \leq .10$ <sup>b</sup>  $p \leq .05$ <sup>c</sup>  $p \leq .01$ 

### 7.2.3.2 Baseline for MPP Partner-Like Services

This analysis sought to establish the baseline demand for Partner-like services before multifamily building operators become involved in MPP. This section includes results from the Impact team's participant interviews to demonstrate the baseline among both recent participants and participants involved in previous versions of the program. The Impact team's report also includes a deeper analysis of these questions. Among contacts in the participant sample who reported engaging in any energy efficiency activities prior to participating in MPP, 32% incorporated efficiency equipment into a multifamily building based on a comprehensive energy assessment. Examined across the entire interview sample, only 17% of participants (19 of 110) received a comprehensive energy audit before participating in MPP. Results revealed no differences in the proportion of participants who received a comprehensive energy assessment prior to MPP as a function of any of the comparison variables, but those who had incorporated efficiency equipment into

a building based on a comprehensive energy assessment rated themselves as more knowledgeable about how to reduce energy use ( $mean = 6.4$ ) than those who had not ( $mean = 4.8$ ).<sup>131</sup>

Among the 87 existing building participants in the Impact sample, 39% had a non-MPP energy audit completed at their property in the last 10 years, 76% of which were comprehensive. Looking across the entire Impact sample, results indicate that a larger proportion of participants (26 of 87, or 30%) reported receiving a comprehensive energy audit than did in the participant sample, although differences in wording between the two surveys may have exaggerated this difference. Specifically, respondents in the Impact sample reported whether their energy audit was comprehensive, while respondents in the participant sample reported whether they had ever incorporated efficiency equipment into a multifamily building based on a comprehensive energy assessment.

Among participants in the participant interview sample, a firm outside of the participant's company conducted all but one (95%) of the comprehensive energy assessments. Most of these assessments included information on how much each measure would cost to install (77%) and how much energy each measure would save (82%), suggesting that most participants who received assessments commonly received information similar to that provided by MPP Partners. Nine participants were able to report the energy savings achieved from the installed measures, which averaged 25.6%. Table 7-8 provides the percent savings reported by each participant.

**Table 7-8. Energy Savings Reported from Pre-MPP Comprehensive Energy Assessment**

Project 1	Project 2	Project 3	Project 4	Project 5	Project 6	Project 7	Project 8	Project 9
14%	15%	15%	18%	20%	21%	28%	50%	50%

Almost three-quarters (74%) of participants in the Impact sample reported that their energy audit (comprehensive or otherwise) was performed by someone not tied to sales of products or services, and about half (53%) received a detailed implementation plan that included equipment specification, equipment costs, and energy savings.

### 7.3 The Program Experience

Interviews with participants solicited information and feedback on each phase of the MPP process: learning about and deciding to participate in the program, choosing a participation path, finding and contracting with a Partner, attaining financing (if needed), conducting the assessment and ERP, construction and inspections, and measurement and verification conducted once construction is complete.

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<sup>131</sup>  $p \leq .05$ .

### 7.3.1 Starting the Program

Participants most commonly heard about MPP from an MPP Partner (21%), NYSERDA (13%), or another organization or program they work with (15%). Table 7-9 summarizes all sources and the proportion of participants who heard about MPP from each source.

**Table 7-9. Where Participants First Heard about MPP**

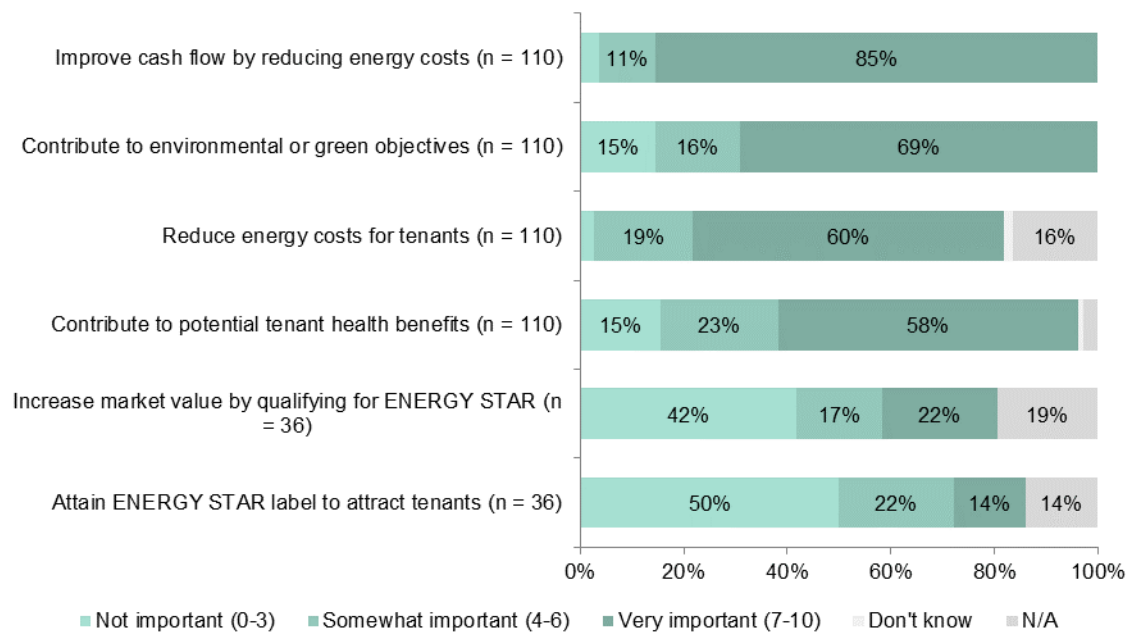
Source	<i>n</i> =110
MPP Partner	21%
NYSERDA	13%
Other organization or program	15%
Peer/colleague	9%
Consultant	9%
Word of mouth	8%
Engineer/architect	8%
Other business associate	5%
Conference	5%
Industry publication	3%
Internet search	3%
Other/unspecified research	3%
Other	1%
Don't know	14%

Note: Multiple responses allowed.

Respondents used 11-point scales of 0 (“not at all important”) to 10 (“extremely important”) to rate the importance of four reasons for upgrading their property: 1) improving cash flow by reducing energy costs; 2) contributing to environmental or “green” objectives; 3) reducing energy costs for tenants; and 4) contributing to potential tenant health benefits. Participants who described their property as new construction also made two subsequent ratings about the importance of attaining ENERGY STAR labels in their decision to participate in the program (Figure 7-4). Contacts from properties in which tenants own units rated reducing utility costs for tenants as more important than did contacts from properties in which tenants lease units,<sup>132</sup> as did participants with firms that have more than one property in New York State compared with those firms with only one property in the State.<sup>133</sup> There was no difference in how important participants with affordable versus market rate properties rated lowering utility costs for tenants.

<sup>132</sup>  $p \leq .01$ .

<sup>133</sup>  $p \leq .10$ .

**Figure 7-4. Importance of Reasons for Participating in MPP**

When asked to describe any other features of or benefits from MPP that motivated their firm to participate in the program, participants most commonly cited financial considerations, like incentives (53%; Table 7-10). About one-third (30%) of respondents mentioned the importance of the MPP Partner and associated services. Overall, contacts with existing buildings more commonly cited financial reasons (87%) than did contacts with new construction projects (67%)<sup>134</sup> and this difference was greatest for incentives (61% versus 44%).<sup>135</sup> Existing building participants also were more likely to mention program structure/ease of participation than were new construction participants (19% versus 4%).<sup>136</sup> Respondents with new construction projects more commonly reported that they were required to implement efficiency measures, either by law or by a funding source (like the New York State Homes and Community Renewal agency) than were respondents with existing buildings (17% versus 7%).<sup>137</sup> Participants working with the Predominant Partner were less likely to mention that the financial incentives motivated their participation (66%) than were participants working with other Partners (84%),<sup>138</sup> and participants working with the Predominant Partner were less likely to mention the goal of reducing energy use in their multifamily

<sup>134</sup>  $p \leq .01$ .

<sup>135</sup>  $p \leq .10$ .

<sup>136</sup>  $p \leq .05$ .

<sup>137</sup>  $p \leq .10$ .

<sup>138</sup>  $p \leq .05$ .

property (9% versus 21%).<sup>139</sup> Contacts at properties where tenants lease units were more likely to cite the MPP Partner and associated services as motivating their participation (38%) than were contacts with properties in which tenants own units (10%).<sup>140</sup>

**Table 7-10. Features or Benefits of MPP that Motivated Firm to Do Project through the Program**

Feature or Benefit	<i>n</i> = 110
Any financial considerations	78%
▪ Incentives	53%
▪ Energy cost savings/return on investment	15%
▪ Program financing	7%
▪ Funding sources view participation favorably	3%
▪ Other/unspecified	15%
Partner and Partner services	30%
Improving building efficiency/reducing energy use	17%
Program structure/ease of participation	13%
Participating in other program that requires energy efficiency measures	11%
Familiarity with NYSERDA/MPP	5%
Marketing/energy-efficient labeling	5%
Ability to do larger-scale project than could be done without MPP	5%
Lower utility costs for tenants	3%
Other	4%
Don't know	2%

Note: Multiple responses allowed.

New construction projects must follow either the Prescriptive path, which requires that each component of an upgrade meet an energy savings standard, or the Performance path, which requires that the project as a whole reach an energy savings standard. About three-quarters of contacts with new construction projects (77%) were aware of these two different paths, and most of the participants in the sample (93%) participated through the Performance path. When asked why they chose one path over another, participants most commonly reported that their Partner recommended which path they choose.

Existing buildings projects with fewer than 50 units are eligible for the Fast Track path, which includes a less expensive assessment process than the Standard path and has no 50% completion incentive payment. Twelve participants in the sample were eligible for the Fast Track path (11%), seven of which (58%) had heard of the Fast Track path. Of those, five projects (71%) were Fast Track. When asked why they chose

<sup>139</sup>  $p \leq .10$ .

<sup>140</sup>  $p \leq .05$ .

the Fast Track path, three participants reported that their Partner or a NYSERDA representative recommended it and two cited the relative speed and ease of this path compared with the Standard path for existing buildings. Four of the five participants who chose the Fast Track path said they would not have participated in MPP had the Fast Track path not been available because the program would have been too complicated and/or taken too long (three mentions) or because the project would have been too expensive (one mention). The fifth participant did not know whether they would have participated in MPP if the Fast Track path had not been available. One participant whose project was not Fast Track did not know what path they took and was unable to answer further questions about his or her decision-making. The participant who was aware of the Fast Track path, but chose not to take it, wanted to receive the 50% project completion incentive, which is given only to participants in the Standard path. Participant interviews took place before any Fast Track projects were completed, so no information is known about participants' experiences through the Fast Track process.

### 7.3.2 Partner Experiences

When describing how they first connected with their MPP Partner, over a third (36%) of participants had a preexisting relationship with their Partner (Table 7-11).<sup>141</sup> Participants who had previously participated in MPP were significantly more likely to have had a preexisting relationship with their Partner (54%) than were those who were participating in MPP for the first time (19%),<sup>142</sup> as were those that have multiple properties in New York State (43%) compared with those who have one property (6%).<sup>143</sup>

**Table 7-11. How Respondent First Connected with MPP Partner**

Source	n=81
Preexisting relationship with Partner	36%
Word of mouth/reputation	14%
Recommended by engineer/architect	11%
Recommended by peer/colleague	10%
Approached by Partner (cold call)	7%
NYSERDA list	7%
Other research/online resources	5%
Recommended by consultant	6%
Recommended by other business associate	6%
Conference	5%
Other	1%
Don't know	4%

Note: Multiple responses allowed.

<sup>141</sup> Long version only.

<sup>142</sup>  $p \leq .01$ .

<sup>143</sup>  $p \leq .01$ .



Thirteen percent of participants (14 of 105) encountered challenges negotiating a contract with their Partner. Over half of these participants with contract challenges (57%) cited difficulties associated with the financial aspects of the partnership, such as agreeing on the Partner's fee. Less than one-third (29%) of participants who had trouble negotiating a contract reported issues surrounding the terms of the contract, and about one-fifth (21%) cited issues regarding the scope of work to be completed by the Partner.

Participants also used an 11-point scale of 0 ("not at all important") to 10 ("extremely important") to rate how important it is that their energy efficiency information come from an independent consultant not affiliated with the contractors or vendors that install or provide equipment. Most participants (79%) reported that it is "very important" that their energy efficiency information come from an independent consultant (7-11), 13% said it was "somewhat important" (4-6), 7% said it was "not at all important" (0-3), and 1% did not know.

About one-quarter (24%) of participants made recommendations for how MPP can make it easier for participants to contract with Partners.<sup>144</sup> More than two-fifths (42%) of these respondents recommended revisions to the incentive structure that would make it easier for participants to pay for Partners, like providing early-stage incentive payments to help cover the cost of the Partner. Another 42% requested that MPP make program guidelines and resources more readily available to and easily accessible by participants. Fifteen percent of participants who made recommendations suggested that MPP make information on Partners' previous experiences with the program more readily available to participants.

### 7.3.3 Financing

Nearly three-quarters of participants (70%) received financing for their project; the proportion of participants who received financing differed significantly by the project's market type, region, and building type (Table 7-12). Affordable projects were more likely to receive financing than market rate projects, and projects done with the Predominant Partner were more likely to receive financing than those done with other Partners. Downstate projects and new construction projects, which tended to be more expensive than their counterparts, were more likely to receive financing than upstate or existing building projects.

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<sup>144</sup> Long version only.

**Table 7-12. Proportion of Participants Who Received Financing for Their Project and Required Additional Financing to Cover Costs of Recommended Efficiency Measures**

Variable	Level	Received Financing ( <i>n</i> = 103)	Required Additional Financing to Cover Incremental Costs ( <i>n</i> = 73)
Sample		70%	36%
Building type	New construction	<b>100%</b>	<b>21%</b>
	Existing building	<b>49%***</b>	<b>59%**</b>
Region	Downstate	<b>78%</b>	<b>30%</b>
	Upstate	<b>50%***</b>	<b>56%**</b>
Market type	Affordable	<b>79%</b>	36%
	Market rate	<b>41%***</b>	33%
First time working with MPP <sup>a</sup>	Yes	64%	<b>45%</b>
	No	79%	<b>24%*</b>
Has one New York State property	Yes	71%	<b>53%</b>
	No	65%	<b>31%*</b>
Worked with Predominant Partner	Yes	<b>94%</b>	<b>15%</b>
	No	<b>57%***</b>	<b>53%***</b>

<sup>a</sup> Due to the “Don’t know” responses for the variable, overall *n* = 71, “Yes” *n* = 38, and “No” *n* = 33.

\* *p* ≤ .10.

\*\* *p* ≤ .05.

\*\*\* *p* ≤ .01.

Ten participants (9%) in the sample received RGGI funding.<sup>145</sup> The low number of participants who received RGGI funding precluded reliable statistical testing for differences between projects that did and did not receive RGGI funding, but it is notable that all ten RGGI projects were existing building projects located downstate, eight were market rate cooperatives, seven were working with MPP for the first time, and seven are the firm’s only building in New York State. Exploratory analyses revealed no clear relationships between whether a project received RGGI funding and any other aspect of the financing process.

Among participants who received financing, over one-third (36%) required additional financing to cover the incremental costs of MPP-recommended efficiency measures. Requiring additional funding to cover incremental costs was more common among affordable (versus market rate) properties, upstate (versus downstate) properties, existing building (versus new construction) projects, firms that have one (versus multiple) property in New York State, and firms that did not work with the Predominant Partner (versus those that did; Table 7-12).

<sup>145</sup> Information attained from CRIS database.

Participants who received financing described the public and public-private sources of financing partnerships they considered. The PE/MCA team coded participants' responses in regard to the type of financing (tax credit, loan, tax-exempt bond, grant/subsidy, mortgage/equity, or other/unknown) and the source of financing partnerships considered (city, state, federal, or other/unknown). Table 7-13 includes the percent of participants who considered each type and source of funding and Table 7-14 and Table 7-15 summarize any group differences in type or source of funding used. Participants who used tax-exempt bonds also were likely to have larger buildings than participants who did not.

Among participants who received financing for their projects, about half (52%) had heard of Green Jobs – Green New York (GJGNY), a NYSERDA program that offers financing options for energy efficiency upgrades. Of those, five participants considered financing from GJGNY and three received financing from the program. Of the three contacts who received GJGNY financing, one contact said that his or her firm would not have gone through with the project had GJGNY financing not been available, while the other two said they would have proceeded with the project without GJGNY financing. One participant who considered, but did not receive, financing from GJGNY said that the process was too difficult to pursue, and the other said the project did not qualify for the financing. Among participants who had heard of GJGNY, but did not consider it as a source of funding, a majority (65%) said they were not familiar enough with the program specifics to consider it seriously. Combining participants who had not heard of GJGNY and those who did not know enough about GJGNY to consider it, results indicate that 75% of participants who financed their project were not informed enough about GJGNY to pursue it as a source of financing.

**Table 7-13. Public and Public-Private Sources of Funding Considered**

<b>Funding Type</b>	<b><i>n</i> = 73</b>
Tax credit	48%
Loan	27%
Tax-exempt bond	21%
Grant/subsidy	19%
Mortgage/equity	6%
Other/unknown	29%
<b>Funding Source</b>	<b><i>n</i> = 73</b>
City	47%
State	47%
Federal	26%
Other/Unknown	25%
Don't know	1%
Not applicable	3%

Note: Multiple responses allowed.

**Table 7-14. Group Differences in Public and Public-Private Types of Funding Considered**

Funding Type	Building Type (n=73)		First Time Working with MPP (n=71)		Firm Has One NYS Property (n=73)		Worked with Predominant Partner (n=73)	
	New Con- struction (n=44)	Existing Building (n=29)	Yes (n=38)	No (n=33)	Yes (n=15)	No (n=58)	Yes (n=33)	No (n=40)
Tax credits	61%	28%***	32%	67%***	20%	55%**	67%	33%***
Loan	23%	35%	40%	15%**	53%	21%	35%	18%
Tax-exempt bonds	18%	24%	8%	36%***	0%	26%	23%	18%
Grant/subsidy	25%	10%	18%	21%	13%	21%	30%	10%**

\*  $p \leq .10$ .\*\*  $p \leq .05$ .\*\*\*  $p \leq .01$ .**Table 7-15. Group Differences in Whether Considered City Funds**

Building type (n=73)		Region (n=73)		Firm has one NYS property (n=73)		Worked with Predominant Partner (n=73)	
New Construct- ion (n=44)	Existing Building (n=29)	Downstate (n=57)	Upstate (n=16)	Yes (n=15)	No (n=58)	Yes (n=33)	No (n=40)
61%	24%***	52%	25%**	20%	53%**	61%	35%**

\*  $p \leq .10$ .\*\*  $p \leq .05$ .\*\*\*  $p \leq .01$ .

A majority (59%) of participants who received financing for their project said that working with MPP made it easier for them to secure sufficient funding. Of those, 77% reported that MPP helped them secure funding because funding sources prefer or require that recipients of funds participate in an energy savings program like MPP, 35% reported that incentives helped pay for the project or fill in gaps in funding, and 16% said the energy savings projected in the ERP helped them secure funding.

Of the 73 participants who pursued financing for their project, 25 (34%) reported that their Partner helped them secure funding. Partners' contributions to the financing process included recommending and communicating with potential funding sources, providing technical information that was required for applications, and assisting with the completion of paperwork.

Participants who provided recommendations for improving Partner or NYSERDA support for the financing process expressed few concerns regarding the Partners' role and instead focused on recommendations for improving NYSERDA support.<sup>146</sup> Forty-three percent of contacts who provided recommendations said that MPP should provide more information about financing options and incentives to participants, which gives further evidence that participants were not well informed about financing opportunities, such as GJGNY. About one-quarter of participants (24%) recommended simplifying and streamlining the financing process and increasing coordination between NYSERDA and funding sources.

### 7.3.4 Assessments and the ERP

Among participants with new construction projects, most (83%) said their Partner became involved early in their property's design process, one participant said his or her Partner became involved midway through the design process, and five (15%) said their Partner did not become involved until the end of the design process.

Contacts with new construction projects described the members of their design team, summarized in Table 7-16.<sup>147</sup> Most (91%) respondents said that all members of the design team were involved in the discussion of energy efficiency opportunities.

**Table 7-16. Members of Design Team for New Construction Projects**

Team member	n=32
Architect	100%
Engineer	94%
Partner	81%
Owner	53%
Developer	53%
Builder	44%
Contractor	9%
Consultant	6%
Other internal staff (property manager, director of development)	6%
Engineer	6%
Commissioning agent	3%
End-users	3%

Note: Multiple responses allowed.

<sup>146</sup> Long version only.

<sup>147</sup> Long version only.

Most contacts (97%) had received an assessment of energy efficiency upgrade opportunities from their Partner by the time of the interview. A majority of these contacts reported that the scoping process met their expectations (78%)<sup>148</sup> and that their Partner provided sufficient information to support their decision-making about which recommendations to implement (85%).

Thirty percent of participants who had received an assessment said they pursued all of their Partner's recommendations, over half (58%) pursued some of their Partner's recommendations, and 12% did not know or had not yet decided which recommendations to pursue. Participants working with MPP for the first time were more likely to pursue some, rather than all, of their Partner's recommendations, compared with participants who had worked with MPP in the past.<sup>149</sup> Participants who pursued all of the Partner's recommendations were likely to have smaller buildings than were those who pursued some of their Partner's recommendations.<sup>150</sup> Participants who pursued only some of their Partner's recommendations most frequently cited financial considerations as their reasons for not pursuing recommended measures (78%); 15% rejected recommendations they reported were too difficult or impossible to implement.

Thirty-six participants wanted to install measures at the property that did not qualify for an incentive, either because the measure was not incented by MPP or because it would not save enough energy. Table 7-17 provides a summary of these measures. Forty-two percent of these participants installed these measures despite the lack of financial incentive from MPP.

**Table 7-17. Measures Participants Wanted to Install That Were not Incented by MPP**

Measure	n=36
Building envelope:	
▪ Windows	14%
▪ Façade	6%
▪ Roof	6%
▪ Doors	6%
▪ Other	3%
Alternative energy sources:	
▪ Solar photovoltaic system	28%
▪ Cogeneration	8%
▪ Other	6%
continued	

<sup>148</sup> Long version only.

<sup>149</sup>  $p \leq .05$ .

<sup>150</sup>  $p \leq .05$ .

Measure	n=36
Heating and cooling:	
▪ Boilers	8%
▪ Other	6%
▪ Domestic hot water	6%
▪ Lighting	6%
▪ Green roof	6%
▪ Monitoring measures	3%
▪ Rainwater harvesting	3%
Other	8%
Don't know	3%

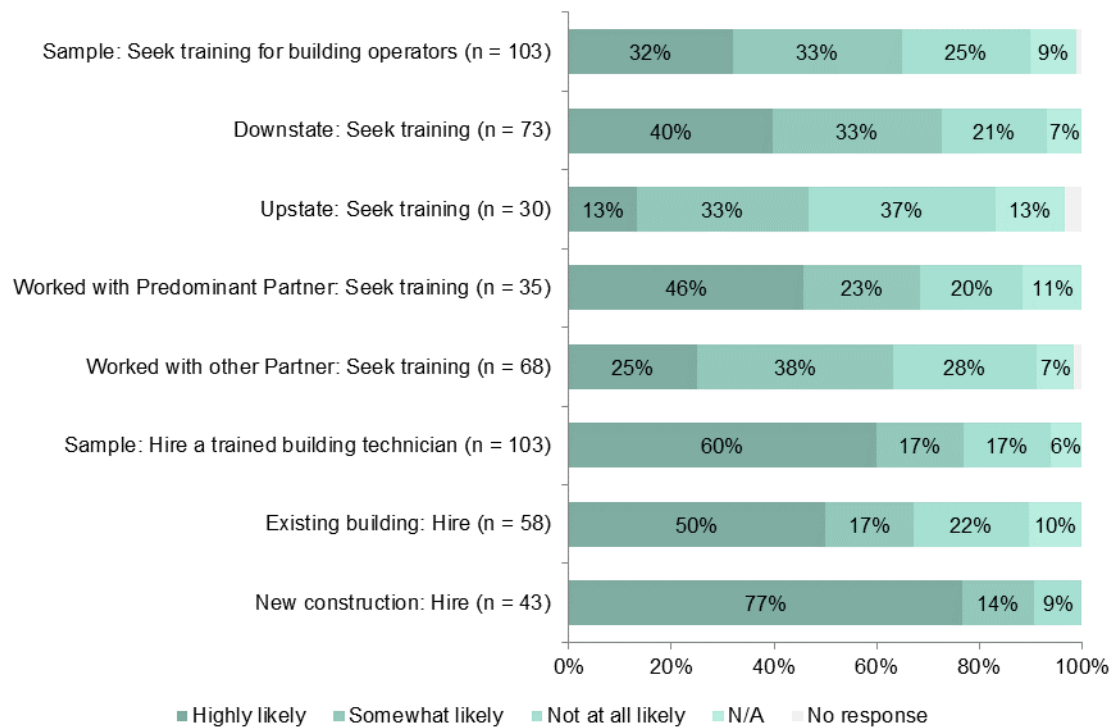
Note: Multiple responses allowed.

Most participants (86%) reported that their Partner was involved in the decision-making process regarding the final design of the project. Partners' contributions typically involved providing recommendations on specific design elements, helping to navigate MPP paths and requirements, and/or conducting energy modeling. When describing the aspect of their Partner's involvement that was most useful, participants most often cited their Partner's knowledge and expertise, energy modeling, and their Partner's responsiveness and professionalism throughout the decision-making process.

Participants also rated the value of their Partner's contribution to the decision-making process on an 11-point scale of 0 ("no value at all") to 10 ("extremely valuable"). Most (89%) participants rated their Partner's contribution as "somewhat" to "extremely valuable" (a rating of "4" or above). Of the seven participants who rated their Partner's contribution as having "little" value, five attributed their rating to the fact that they required little help from their Partner, one cited the Partner's lack of knowledge about his or her specific building type, and one reported that their Partner did not provide the desired level of assistance.

To assess future demand for Partner-like services, participants rated the likelihood that they will seek training for their building operators and hire a trained building technician to recommend efficiency upgrades for their next multifamily property project because of their experiences working with an MPP Partner (Figure 7-5).

**Figure 7-5. Likelihood of Seeking Training for Building Operators and Hiring Trained Building Technicians in the Future**



Contacts with downstate projects expressed more interest in seeking training for their building operators than did those with upstate projects,<sup>151</sup> as did participants who worked with the Predominant Partner, compared with other participants.<sup>152</sup> Participants with new construction projects expressed more interest in hiring trained building technicians to recommend energy efficiency upgrades than did contacts with existing building projects.<sup>153</sup>

Thirty-two participants made recommendations for improving Partners or NYSERDA's role during the project planning and assessment phases. Six participants wanted more Partner involvement during these project phases, but participants again made more recommendations to improve NYSERDA support than Partner support. About one-third (34%) of participants who made suggestions recommended shortening and simplifying the assessment phase; 31% said that MPP should clarify program guidelines, like deadlines, paths, and definitions (NYSERDA's distinction between high-rise versus low-rise, for example).

<sup>151</sup>  $p \leq .05$ .

<sup>152</sup>  $p \leq .10$ .

<sup>153</sup>  $p \leq .10$ .



### 7.3.5 Construction and Inspections

Participants were in different stages of construction at the time of the interviews. Construction had not started on 27% of projects, was underway at 48% of projects, and was complete at 25% of projects. One-third (33%) of participants said that their Partner was or would be involved in construction management support, 65% of whom described construction management support activities that are expected of all Partners, such as recommending equipment or conducting inspections. Another 28% said their Partner had assisted or would assist with selecting contractors, and 12% said their Partner had conducted or would conduct construction or installation work on the project.

Table 7-18 presents a summary of the specific construction management, contractor selection, and construction/installation activities conducted by Partners and the frequency with which participants reported each activity.

At the time of the interviews, Partners had completed inspections at 60% of projects where construction was underway or complete. At 87% of these properties, internal project staff was involved in the inspection. Most participants (92%) reported that inspections were reasonably easy to schedule. The three who had difficulties scheduling inspections said the challenges were their building managers' busy schedules, a miscommunication with their Partner about the scheduled inspection time, and their Partner's slow response to emails about finalizing the inspections.

**Table 7-18. Partner Involvement in Construction Activities**

Activity	Percent
<b>Partner provided construction management support</b>	<b>n=34</b>
▪ Managed subcontractors	9%
▪ Involved in bidding process	6%
▪ Engaged in construction activities (ordered materials, removed debris)	3%
▪ Unspecified/other construction management support	18%
▪ Provided program-mandated support activities	65%
<b>Partner assisted with selecting contractors</b>	<b>n=29</b>
▪ Recommended contractors	38%
▪ Provided feedback on options	24%
▪ Conducted all hiring activities for some/all of the subcontractors	10%
▪ Participated in interviews/bidding process	7%
▪ Helped with paperwork	7%
▪ Unspecified/other assistance	31%
continued	

Activity	Percent
<b>Partner conducted construction or installation work</b>	<b>n=12</b>
▪ Installed insulation	33%
▪ Installed weatherization measures	17%
▪ Installed thermostats/temperature controls	17%
▪ Installed lighting	17%
▪ Installed solar PV panels	17%
▪ Unspecified/other assistance	42%

Note: Multiple responses allowed.

Among participants for whom internal project staff was involved in the inspection process, 54% said that the inspection identified issues and most of those participants (86%) said the issues were reasonably easy to address. The participants who reported that the inspection revealed issues tended to have smaller buildings (measured in number of units) than those for whom the inspection did not reveal any issues.<sup>154</sup> One participant who reported that the issues were challenging to address said that the changes required waivers from NYSERDA and the removal of walls. The other participant said that it was expensive to change the measures and he/she was unable to return items they already had purchased, but no longer could use.

### 7.3.6 Measurement and Verification

At the time of the interviews, NYSERDA program staff had inspected four of the projects where construction was complete.<sup>155</sup> Internal project staff was present at three of these inspections. No participants cited any issues with the inspections.

MPP requires participants to provide utility bills to NYSERDA for up to five years post-construction, and NYSERDA staff may do onsite inspections for up to three years post-construction. When asked whether they had any concerns about these requirements, 22% of participants expressed concerns with providing utility data and 10% reported that they were unaware of this requirement.<sup>156</sup> Most of participants' concerns regarded the logistical/administrative aspects of attaining utility bill information, as well as the burden of completing the necessary paperwork. Thirteen percent of participants also expressed concerns about allowing staff to do onsite inspections, most commonly about logistical/administrative issues, and 13% reported that they were unaware of this requirement.

Participants are eligible to receive a bonus for attaining 20% or higher energy savings at their MPP property. About half of participants (54%) reported that their Partner or ERP suggested that they could receive the bonus (Table 7-19).

<sup>154</sup>  $p \leq .01$ .

<sup>155</sup> Long version only.

<sup>156</sup> Long version only.

**Table 7-19. Partner/ERP Suggested Project Could Receive Bonus for Achieving 20% or More Savings**

Sample (n=103)	Building Type (n=101)		Market Type (n=101)		Region (n=103)		Units Leased or Owned (n=63)	
	New Construction (n=43)	Existing Building (n=58)	Affordable (n=79)	Market Rate (n=22)	Downstate (n=73)	Upstate (n=30)	Leased (n=46)	Owned (n=17)
54%	44%	64%**	61%	36%**	43%	83%***	70%	24%***

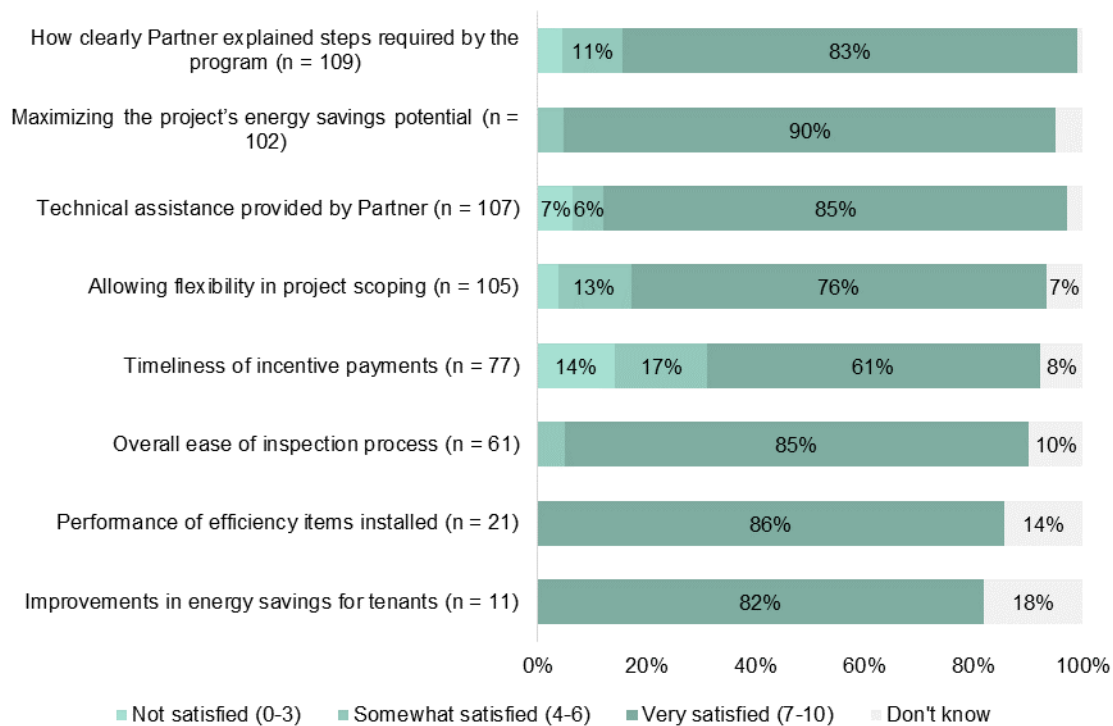
\*  $p \leq .10$ .\*\*  $p \leq .05$ .\*\*\*  $p \leq .01$ .

Participants with affordable properties, participants whose units were leased, upstate participants, and participants with existing building projects were more likely to have heard about the bonus than were their counterparts. Participants who had heard about the bonus also had smaller buildings than those who had not. Among participants whose Partner or ERP informed them about the bonus, 66% either received or expected to receive the bonus.

## 7.4 Perceptions and Evaluation of the Program

### 7.4.1 General Satisfaction

Participants used 11-point scales of 0 (“not at all satisfied”) to 10 (“extremely satisfied”) to rate their satisfaction with six aspects of the program: 1) how clearly their Partner explained steps required by the program; 2) maximizing energy savings potential; 3) technical assistance provided by their Partner; 4) allowing flexibility in project scoping; 5) timeliness of incentive payments; and 6) overall ease of the inspection process (Figure 7-6).

**Figure 7-6. Satisfaction with Program Elements**

Only participants with completed projects rated their satisfaction with the performance of installed measures. Across these measures, most participants were “somewhat” or “highly” satisfied with the program, although 14% of participants reported being unsatisfied with the timeliness of incentive payments. Participants who reported that a given aspect did not apply to their project are excluded from Figure 7-6; the bar labels include the number of remaining participants whose responses are displayed. Notably, many participants were not able to rate their satisfaction with the timeliness of incentive payments (30%) or the inspection process (45%) because they had not yet reached that stage of the program. Many of the participants with completed projects were not able to rate their satisfaction with the performance of installed measures (19%) or improvements in energy savings (58%) because not enough time had elapsed since their completion of the project to provide an accurate rating.

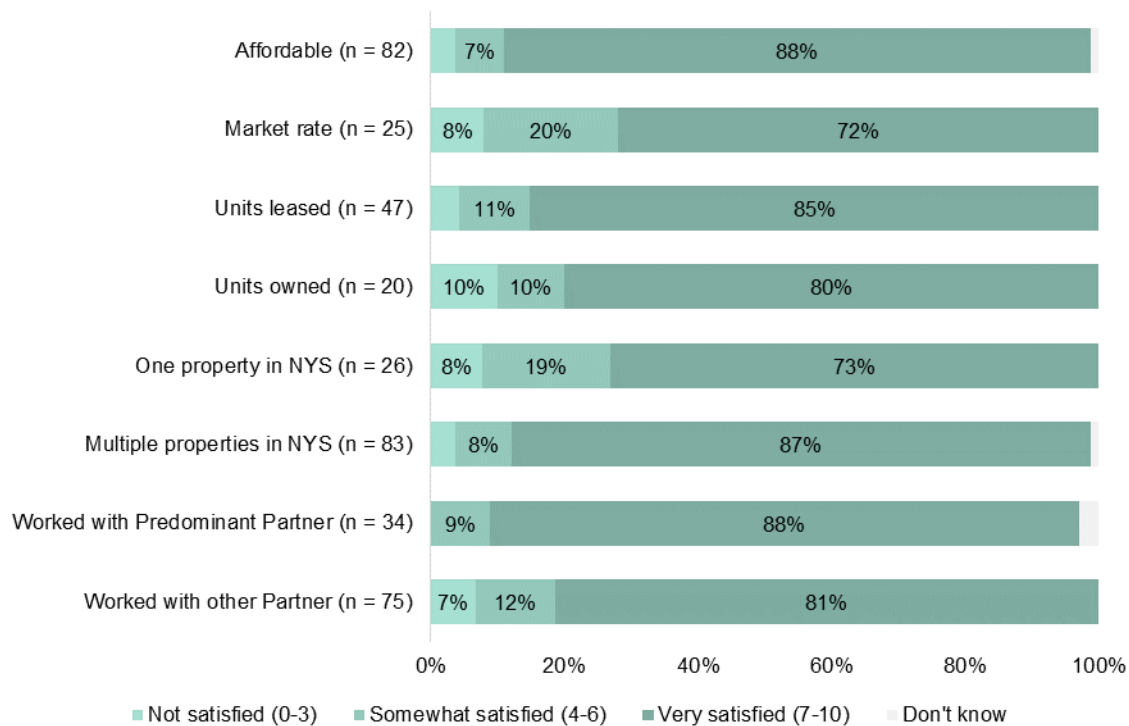
Participants with affordable projects were more satisfied with how clearly their Partner explained the steps required by the program, than were participants with market rate projects.<sup>157</sup> Participants who worked with the Predominant Partner were more satisfied than participants who worked with other Partners (Figure 7-7).<sup>158</sup> Participants with properties where units are leased also were more satisfied with how clearly their

<sup>157</sup>  $p \leq .01$ .

<sup>158</sup>  $p \leq .10$ . “Not applicable” responses are not presented in the figure.

Partner explained the required steps than were participants with properties in which the units were owned (Figure 7-7).<sup>159</sup> Participants who had multiple properties in New York State were more satisfied with how clearly their Partner explained the required steps than those who had only one New York State property (Figure 7-7).<sup>160</sup>

**Figure 7-7. Satisfaction with How Clearly Partner Explained Steps Required by the Program**



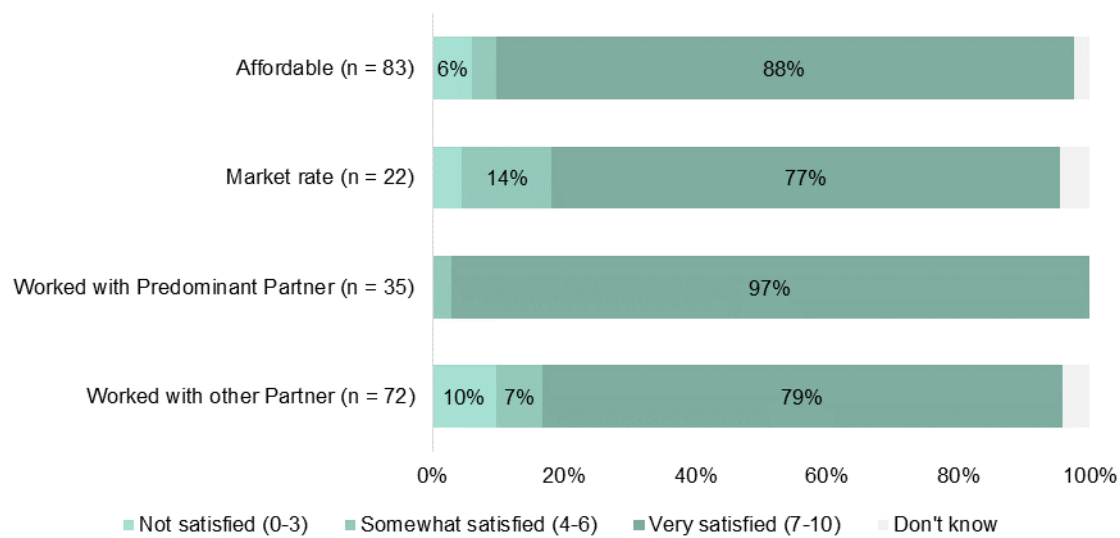
Participants with affordable projects were more satisfied with the technical assistance provided by their Partner, compared with participants with market rate projects,<sup>161</sup> and participants who worked with the Predominant Partner were more satisfied with the technical assistance they received than were participants who worked with other Partners (Figure 7-8).<sup>162</sup>

<sup>159</sup>  $p \leq .05$ .

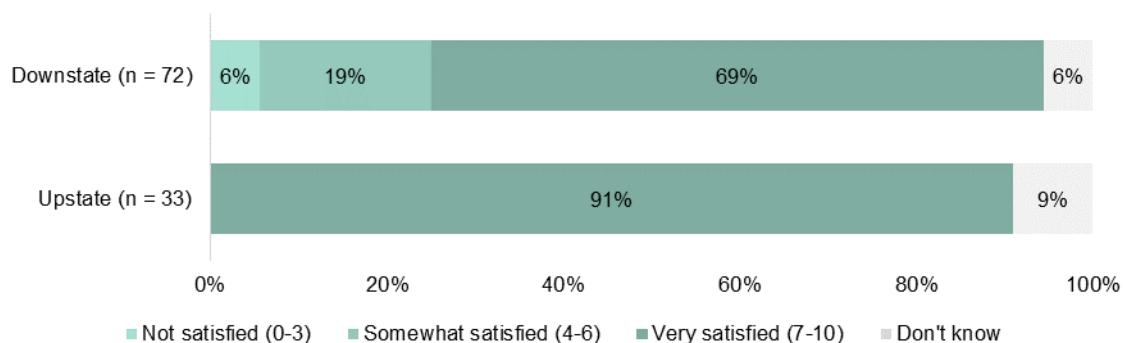
<sup>160</sup>  $p \leq .01$ .

<sup>161</sup>  $p \leq .10$ .

<sup>162</sup>  $p \leq .01$ . "Not applicable" responses are not presented in the figure.

**Figure 7-8. Satisfaction with Technical Assistance Provided by Partner**

Upstate participants were also more satisfied with the flexibility in project scoping than were downstate participants (Figure 7-9).<sup>163</sup> Results revealed statistically significant differences between participants who worked with the Predominant Partner or with another Partner regarding satisfaction with how clearly their Partner explained the steps required by the program and with the technical assistance provided by their Partner. As shown in Appendix C, these effects are no longer significant when comparing participants' ratings as a function of whether they worked with more- or less-experienced Partners. The best predictor of satisfaction with Partner services appears to be whether participants worked with the Predominant Partner.

**Figure 7-9. Satisfaction with Flexibility in Project Scoping**

<sup>163</sup>  $p \leq .01$ . "Not applicable" responses are not presented in the figure.

About one-quarter of participants (23%) reported that MPP requirements slowed the pace of their project, and responses again varied as a function of project characteristics (Table 7-20).

**Table 7-20. Program Requirements Have Slowed Pace of Project**

Group	Percent of Total
Sample ( <i>n</i> =110)	23%
<b>Building type (<i>n</i>=108)</b>	
▪ New construction ( <i>n</i> =46)	11%
▪ Existing building ( <i>n</i> =62)	32%***
<b>Market type (<i>n</i>=108)</b>	
▪ Affordable ( <i>n</i> =83)	19%
▪ Market rate ( <i>n</i> =25)	36%*
<b>Region (<i>n</i>=110)</b>	
▪ Downstate ( <i>n</i> =77)	16%
▪ Upstate ( <i>n</i> =33)	39%***
<b>First time working with MPP (<i>n</i>=110)</b>	
▪ Yes ( <i>n</i> =62)	29%
▪ No ( <i>n</i> =44)	16%**
<b>Has one New York State property (<i>n</i>=110)</b>	
▪ Yes ( <i>n</i> =26)	42%
▪ No ( <i>n</i> =84)	17%***
<b>Worked with Predominant Partner</b>	
▪ Yes ( <i>n</i> =35)	3%
▪ No ( <i>n</i> =65)	32%***

\*\*  $p \leq .05$ .

\*\*\*  $p \leq .01$ .

The frequency with which participants reported that program requirements delayed their project differed as a function of building type, market type, region, whether the participant was working with MPP for the first time, whether the firm has one or multiple properties in New York State, and whether the firm was working with the Predominant Partner or another Partner. The program requirement that participants most commonly said slowed the pace of a project was the approval process; other reasons included paperwork and requirements, the scoping process, and the inspection process. Program aspects reported as slowing the pace of a project did not differ as a function of any firm or project characteristics.

At the end of the interview, the PE/MCA team asked participants if they had any final comments or recommendations for improving the program. About one-fifth of participants (21%) recommended increasing the breadth and/or amount of financial incentives. One-tenth of participants reiterated the fact that program information, requirements, and paths should be more readily available to participants. Other

recommendations, all of which were made by fewer than ten participants, included: 1) make incentive payments timelier; 2) increase MPP or NYSERDA oversight; 3) simplify the program steps; and 4) allow for more flexibility based on project specifics.

### 7.4.2 Terminated Projects

Four participants in the sample had terminated one or some of their MPP projects and five had terminated all of their MPP projects. Three of the contacts who had terminated all of their projects were cooperatives or condominiums.

Participants reported whether any of the following three reasons applied to why they terminated a project: 1) reasons internal to the firm; 2) economic/market reasons; and 3) the MPP itself. All but one participant who terminated a project (89%) attributed project termination to the MPP itself; three also cited economic/market reasons (33%), and one cited reasons internal to his or her company (11%). Notably, explanations for why MPP contributed to the termination of a project were idiosyncratic. Reasons included dissatisfaction with the Partner, the program's lack of flexibility, and the unlikelihood that the project would attain 15% energy savings.

## 7.5 Spillover

In addition to determining a baseline for Partner-like services prior to MPP participation, this analysis established a baseline for post-MPP energy efficiency activities at both MPP properties and at other properties owned or managed by firms that had been involved with MPP. The Impact team's report includes a deeper analysis of the spillover created by MPP.

Among participants in the sample with completed projects, six (23%) pursued additional efficiency measures at the MPP property after construction was complete. These additional efficiency measures included HVAC, building envelope, domestic hot water, and lighting upgrades and the installation of submeters. Three of these participants reported that their association with MPP and/or a Partner influenced their decision to implement additional energy efficiency measures.

Among participants who owned or managed an existing building in New York State, twenty (67%) installed energy efficiency measures at a multifamily property after they became involved with MPP for the first time. Of those, nine participants (45%) reported that their association with MPP and/or Partner influenced their decision to implement additional energy efficiency measures. Among those nine participants, there was some variation in the number of buildings at which they installed un-incented energy measures. (Table 7-21) When asked who provided them with advice on which energy efficiency measures to pursue, participants most commonly cited product vendors, internal project staff, and their MPP Partner.



**Table 7-21. Number of Buildings at Which Participants Installed Un-incented Efficiency Measures**

Project 1	Project 2	Project 3	Project 4	Project 5	Project 6	Project 7	Project 8	Project 9
1	3	5	6	6	6	9	35	DK

To document energy efficiency activities at non-MPP properties, the PE/MCA team asked participants about renovations at the non-MPP property their firm has owned or managed longest. Participants said their firm had owned or managed the building for 1 to 100 years, with an average of 20 years. Buildings had an average of 130 units, and sizes ranged from two to 900 units. Table 7-22 also provides detailed information on years of ownership and building size (in units).

**Table 7-22. Years Owned/Managed and Size of the Property Firm Had Owned or Managed the Longest**

Years Owned/Managed	Percent of Total
1 to 9 years	20%
10 to 19 years	24%
20 to 29 years	23%
30 or more years	19%
Don't know	15%
Number of Units	Percent of Total
50 or fewer units	33%
51 to 100 units	17%
101 or more units	29%
Don't know	20%

Fifteen percent of participants said this property had never been renovated, 17% reported that the building was currently undergoing renovations, and 20% did not know the last time the building had been renovated. Table 7-23 provides a summary of the remaining participants' responses regarding the number of years since the property had been renovated.

**Table 7-23. Years Since Longest Owned/Managed Building Last Renovated**

Years	n=36
1 year	22%
2 – 5 years	39%
6 – 10 years	17%
11 – 15 years	8%
16 or more years	14%

Among the participants who knew details about the last time the property had been renovated, more than half said the most recent renovation included upgrades to heating and cooling (55%), interior lighting in common areas (69%), and exterior lighting (53%). More than one-quarter of these participants (29%) received incentives for the upgrades. Participants with buildings that were not currently undergoing renovations expected to renovate the building again in about six years, on average, with responses ranging from one to 15 years.

## 7.6 Conclusions

Participants interviewed for this chapter represent a broad range of companies and roles within those companies. A majority of the projects discussed during interviews are affordable rate, located downstate, and have units that are leased (rather than owned) by tenants. A large majority of new construction projects participated through the Performance path, and a large majority of existing building projects participated through the Standard path (rather than Fast Track path).

Before participating in MPP, most participants had installed lower-scale energy efficiency measures at their properties, such as upgrading equipment, but very few (17%) had received a comprehensive energy assessment like those provided by MPP Partners. In general, respondents considered themselves somewhat knowledgeable about reducing energy use before participating in MPP.

Most participants report finding out about MPP from NYSERDA (including Partners) or other organizations and programs involved in the multifamily market. A large majority of participants chose to participate in the program for financial reasons, such as the program incentives or financing.

In general, participants report a high level of involvement from their Partners in the design, decision-making, and construction phases of the MPP process, and most are satisfied with the assistance they received from their Partner (except for issues identified in the Partner and program experiences section below). Participants generally are satisfied with the program as a whole and report moderate to high interest in hiring a trained building technician, like the MPP Performance Partner, to recommend efficiency upgrades for their next multifamily project.

In analyzing the participant interviews, the PE/MCA team also identified three major themes across results, discussed in detail below.

1. Participants with affordable projects tend to have more positive program experiences than those with market rate projects,
2. Participants who work with the Predominant Partner tend to have more positive program experiences than participants who work with other Partners, and

3. Participants, particularly those new to the program, would like program information and guidelines to be made clearer and more easily accessible.

### 7.6.1 Market Type and Program Experiences

Participants with affordable projects appear to have a better understanding of program requirements and options and they are more satisfied with their Partners than are the participants with market rate projects. Specifically, participants with affordable projects are more likely than market rate participants to have heard about the 20% or greater energy savings bonus, and they are more satisfied with how clearly their Partner explained steps required by the program. Participants with affordable projects also are less likely to report that program requirements slowed the pace of their project, and they are more satisfied with the technical assistance their Partner provided.

There are differences in program structure for affordable and market rate projects that made affordable projects eligible for larger incentives than market rate projects. There also are differences in the types of projects that tended to be affordable versus market rate that may contribute to these differences. Affordable projects account for a higher percentage of new construction projects, downstate projects, and projects conducted with the Predominant Partner (as described further in Section 7.2.1). Market rate projects account for a greater percentage of projects with units that are owned (cooperatives or condominiums) and those that have only one multifamily property in New York State. Affordable and market rate participants report similar levels of knowledge about how to reduce energy use in their buildings before their involvement with MPP, however.

### 7.6.2 Partner and Program Experiences

One objective of this evaluation is to examine whether Partners' level of experience working with MPP, as measured in the number of completed projects, is associated with participants' experience in the program. Notably, results do not reveal many effects for Partner experience in general. Instead, participants' experiences in the program tend to differ as a function of whether they work with the most productive (Predominant) Partner, who is responsible for one-third of the projects in the interview sample.

Participants who worked with the Predominant Partner tend to be more satisfied with how clearly their Partner explained the steps required by the program and with the technical assistance provided by their Partner than are participants who worked with other Partners. Participants who worked with the Predominant Partner also are less likely to require additional financing to pay for recommended efficiency measures, and they are less likely to report that aspects of the program slowed the pace of their project.

It is important to note, however, that there are significant differences between the firms and projects that went through MPP with the Predominant Partner and those that went through the program with another Partner. The Predominant Partner's projects tend to be new construction projects, rather than existing buildings, and affordable rather than market-rate projects. Of the 26 participants in the sample who have

only one building in New York State and may be less familiar with the steps involved in upgrading a multifamily property, only one worked with the Predominant Partner. However, there was no difference in whether participants reported having had a preexisting relationship with the Predominant Partner versus other Partners, suggesting that it is not simply that the Predominant Partner was less likely to be working with a firm for the first time than were other Partners. Thus, it is difficult to determine whether participants' greater satisfaction with the Predominant Partner is due to a self-selection bias (participants "in the know" tend to seek out the Predominant Partner) or whether the quality of the Predominant Partner's work with participants tends to surpass that of other Partners.

### 7.6.3 Accessibility of Program Information

One of participants' most common recommendations for improving MPP is that program guidelines, options, and other information be made clearer and more easily accessible to participants. Indeed, when asked to provide feedback on each stage of the MPP process, about one-third of participants in each case suggested that MPP make program information clearer and more easily accessible. The findings that 75% of participants had not heard of GJGNY or did not know enough about it to get funding through GJGNY, and that 13% were unaware that NYSERDA staff may inspect their project for up to three years post-construction provide further evidence that some participants lacked clarity or knowledge about program requirements and opportunities.

During interviews, some participants provided recommendations for how to make program information more easily accessible to participants, based on their personal experiences. Participants' recommendations include:

- Provide new participants with an online orientation or "NYSERDA 101" tutorial.
- Provide new participants with a face-to-face training session with NYSERDA staff.
- Increase opportunities for participants to interact with one another.
- Provide a three-page handout describing the phases of the program.
- Provide online tutorials/webinars describing program requirements and program path options.
- Provide an *Excel* template that allows participants to determine what program paths and incentives for which they are eligible.
- Provide a database that provides the typical energy savings of incented measures.

## 8 Summary of Key Findings

### 8.1 Market Characterization and Assessment

Summary: MPP's has reached less than 1% of all multifamily properties. However, because MPP has attracted many of the largest multifamily properties in the NYSERDA territory, the program has reached 6.6% of all multifamily units. It is also recruiting about 6% of all new construction projects. Almost all of the savings is being invested in measures that reduce the owner's bills and not the tenants.

The research team used tax records for properties in New York City (NYC) and the rest of the State to develop a comprehensive picture of the existing multifamily sector.

- A large majority of New York multifamily properties (74%), buildings (74%), units (85%), square feet of living area (92%), and property value (89%) is downstate (Table 8-1).

**Table 8-1. Multifamily Property Information: Totals by Upstate and Downstate MPP Areas (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, NYS tax records from NYS Taxation and Finance Department (2013, March), and U.S. Census American Community Survey (2008-2012)

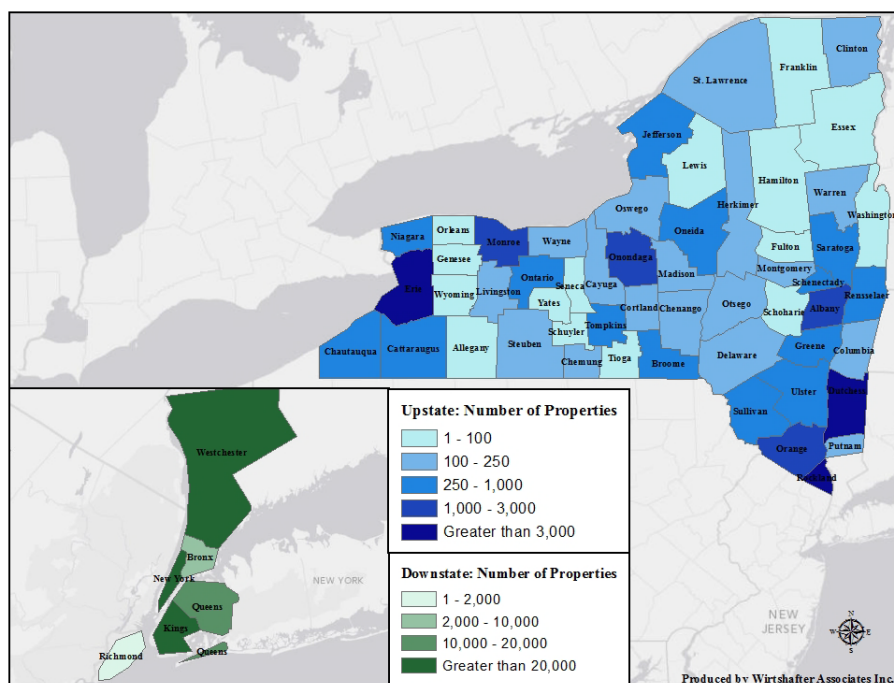
Area	Number of Properties (%)	Number of Buildings (%)	Number of Units (%) <sup>a</sup>	Total Living Area sq. ft. (%)	Total Assessed Value (\$1,000) (%)
Upstate	32,018 (26%)	39,690 (26%)	386,776 (15%)	181,026,634 (8%)	\$10,740,007 (11%)
Downstate	91,552 (74%)	121,128 (74%)	2,140,143 (85%)	2,045,649,636 (92%)	\$85,992,752 (89%)
<b>Total MPP Area</b>	<b>123,570</b>	<b>162,610</b>	<b>2,526,919</b>	<b>2,226,676,270</b>	<b>\$96,732,759</b>

<sup>a</sup> Data from ACS (2008-2012)

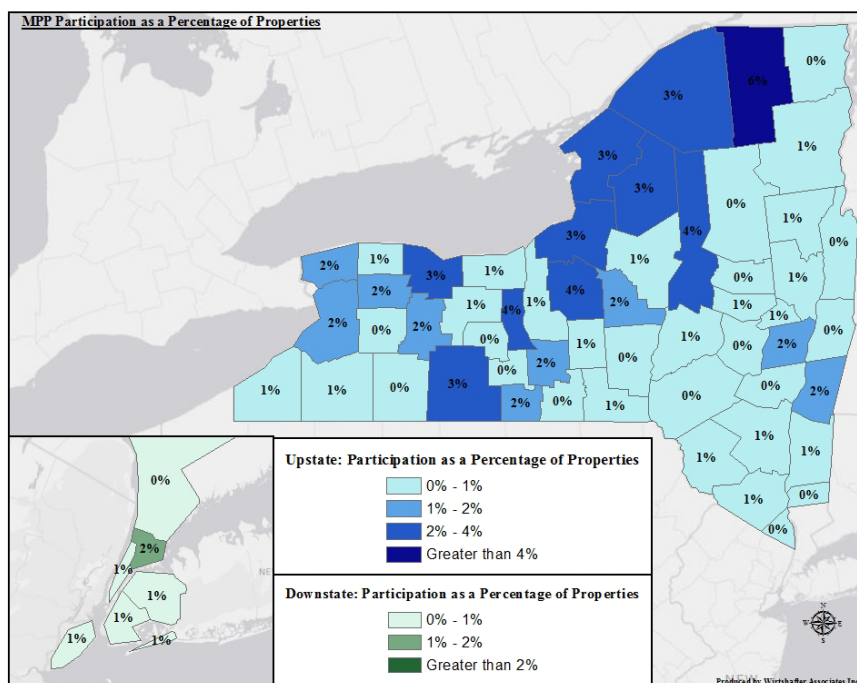
- There is substantial variation in the number of multifamily properties across New York counties, but most are located in urban areas (Figure 8-1).
- Since its inception, MPP has reached less than 1% of all existing multifamily properties, 2.3% of multifamily buildings, and 6.6% of multifamily units in the State, on average, although there is some variation among counties (Table 8-1 and Figure 8-2).

**Figure 8-1. Number of Multifamily Properties by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning and New York State tax records from New York State Taxation and Finance Department (2013, March)

**Figure 8-2. MPP Participation (New and Existing) as a Percentage of All Multifamily Properties**

Sources: CRIS Database 3/5/2013, PLUTO™ V12v2 ©NYC Department of City Planning, and New York State tax records from New York State Taxation and Finance Department 204-2012



- New construction activity dipped significantly after 2009 and is beginning to recover; 2013 activity was about 60% of the high reached in 2008 (Table 8-2). Since 2005, 371 multifamily new construction buildings, or 5.6% of all multifamily buildings constructed, participated in MPP.<sup>164</sup>

**Table 8-2. New Construction Multifamily Permits in NYSERDA Counties (2005-2013)**

Source: U.S. Census 2005-2013; Dodge Players 2005-2013

	Private Building Permits	Public and Private Projects	Private Permits: Units	Valuation of Construction (\$1,000)	Valuation of Construction (\$1,000)
Source	U.S. Census	Dodge Players	U.S. Census	U.S. Census	Dodge Players
2005	1,135	2,393	26,488	\$1,955,730	\$4,540,641
2006	880	2,302	24,348	\$1,977,659	\$5,573,224
2007	896	1,646	29,488	\$2,697,628	\$5,805,432
2008	1,144	1,549	35,696	\$3,184,330	\$5,474,314
2009	294	597	6,937	\$741,283	\$2,061,692
2010	313	549	7,665	\$764,482	\$1,995,200
2011	479	670	11,978	\$1,097,044	\$2,930,528
2012	576	529	13,891	\$1,330,359	\$4,528,115
2013	920	322	21,669	\$2,025,974	\$3,030,005
Totals	6,637	10,557	178,160	\$15,774,489	\$35,939,151

- According to CRIS, of the 719,322 therms savings in versions 4 and 5, 1% was invested in measures that reduced tenant bills and 99% was invested in measures that reduced common space or master metered bills. Of the 38,356,538 kWh savings in MPP versions 4 and 5, 4% was invested in measures that reduced tenant bills and 96% was invested in measures that reduced common space or master metered bills.<sup>165</sup>
- Existing building projects, downstate projects, and market rate projects had higher qualified square footage and a higher savings-to-investment ratio than new construction projects, upstate projects, and affordable rate projects, respectively.

<sup>164</sup> The 371 MPP new construction buildings may have contained some buildings that are public housing while the 6,637 new construction permits were for privately-owned buildings.

<sup>165</sup> It is noted, that CRIS currently credits all investments in shell measures as savings to common spaces. This certainly underestimates tenant bills savings when air conditioning is unit supplied and metered. It is recommended that in the future shell measures be allocated more accurately to credit tenant savings when air conditioning is individually metered.

## 8.2 Review of Program Participants and Partners

Summary: The development of Partners who provide independent and comprehensive energy efficiency services to building owners is a key focus of MPP. MPP has recruited and trained 105 Partners over the last nine years. More than half have never recruited a MPP project, while 33 of the 87 non-Permanently Removed Partners have recruited at least one project in version 5. In addition, most participants had engaged in an energy efficiency activity before participating in MPP.

The PE/MCA team differentiated Partners based on their eligibility to participate in the program, and their MPP experience and activity.

- Of all the MPP Partners, the Experienced/Active Partners (29%) accounted for 94% of all MPP projects and Experienced/Inactive Partners (19%) accounted for 4% of MPP projects; the remaining 2% of MPP projects were distributed across the 52% of Partners who were Inexperienced or Permanently Removed (Table 8-3).

**Table 8-3. Partners and their MPP Projects, by Partner Types for MPP Versions 1-5**

Source: CRIS database, 4/25/2013

Characteristic	Experienced Partners		Inexperienced Partners		Permanently Removed	Total
	Active	Inactive	Active	Inactive		
Number of Partners	31	20	8	28	18	<b>105</b>
Percent of Total	29%	19%	8%	27%	17%	<b>100%</b>
Number of Projects <sup>a</sup>	1,141	48	18	6	7	<b>1,214</b>
Percent of Total	94%	4%	1%	0.5%	0.1%	<b>100%</b>

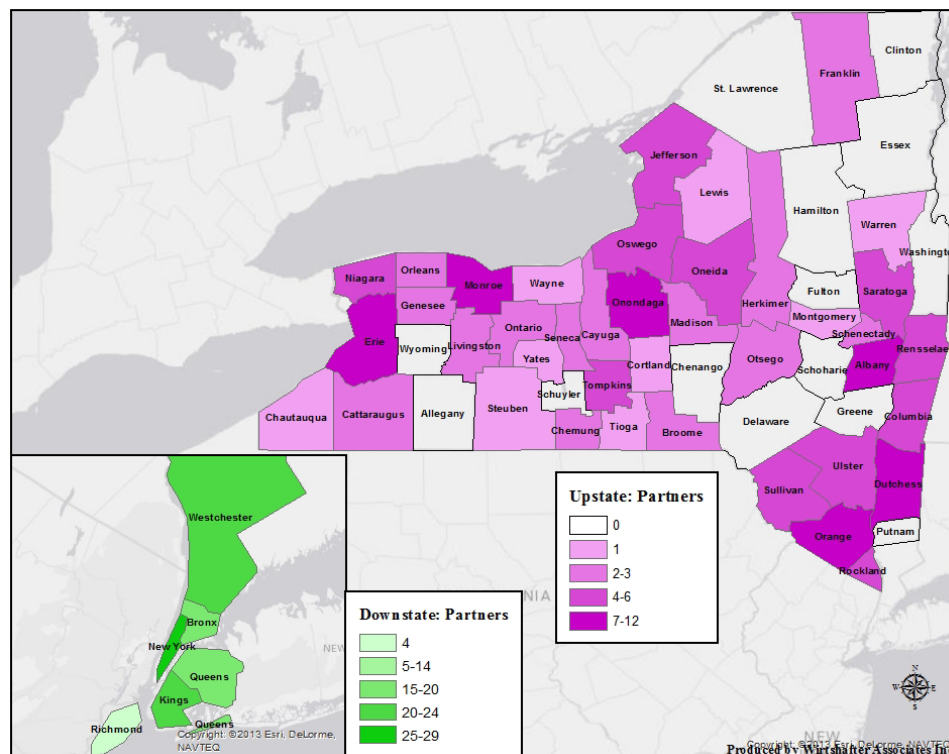
<sup>a</sup> Completed and in-progress projects as of April 2013.

- Figure 8-3 shows that many of the counties in New York have had zero to two Partners involved in MPP projects in the county. Downstate counties, particularly Manhattan and Westchester, and upstate urban counties have had the largest number of Partners involved.



**Figure 8-3. Number of Partners with at Least One MPP Project in County, MPP Versions 1 - 5**

Source: CRIS database, 12/20/2013



- The PE/MCA team interviewed or surveyed nearly half of the Partners (50 of 105) that have been accepted into MPP. These Partners accounted for 87% of all MPP projects in version 1 to 5. One of these Partners accounted for 33% of MPP version 4 and 5 projects (153 of 467 projects completed as of December 20, 2013); while a large minority of Partners (22 of 50) had not completed a project.

The PE/MCA team conducted interviews with primary contacts from 110 version 4 and 5 MPP projects that had not reached the ERP stage by January 1, 2012. The Impact team also conducted interviews with 87 additional MPP participants who completed an ERP before January 1, 2012.

- Forty percent of participant owners surveyed reported that they had previously participated in MPP even though the PE/MCA team attempted to remove such repeat participants from the sample list. It appears that many MPP projects are identified in CRIS as unique limited partnerships formed for the expressed purpose of building or managing the one project.
- Almost all participants (85%) had taken some actions to improve the building's energy efficiency, and one-third had a relationship with their Partner before signing up for MPP.

## 8.3 Market Effects

One major purpose of this study was to establish a baseline for future market effects studies. To facilitate comparisons, this section includes the market effects data from the interview and survey studies.

Summary: About half the Partners were engaged in providing ERP-like services before joining MPP. In most cases, however, Partners were not working on projects that reached the 15% savings threshold. Slightly over three-fourths of Partners (76%, or 16 of 21) reported that, since becoming a Partner, they provided energy efficiency services to non-MPP clients *over and above the services they provided before becoming a Partner*.

### 8.3.1 Partner Activities

#### 8.3.1.1 Prior to MPP

- Prior to MPP, Partners reported that, on average, their multifamily work accounted for about half of their overall business. Utility or government programs supported slightly less than one-third of their multifamily business, on average.
- As shown in Table 8-4, 68% of all Partners were asked about the services they provided to the multifamily sector prior to joining MPP.<sup>166</sup>
  - Half of these Partners (17 of 34) reported providing ERP-like services that included a comprehensive ERP-like report with detailed costs and savings, and an additional 15% (5 of 34) reported providing ERP-like services that were not comprehensive (35% did not provide any ERP-like services).
  - More than one-third of Partners (38%, or 13 of 34) reported always recommending MPP-incented measures in their pre-MPP multifamily projects.
  - Seventy-four percent (25 of 34) of Partners provided energy efficiency services in general prior to MPP, and 9% responded that since joining MPP, they had changed the energy efficiency services they provided to the multifamily sector.
  - Most of the Partners previously involved in multifamily work did not do projects that reached the 15% saving threshold required of MPP. Only 22% of Partners involved in new construction projects and 36% of Partners involved in existing building projects said they achieved 15% savings for at least one of their projects.

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<sup>166</sup> Sixteen Inexperienced/Inactive Partners and two Permanently Removed Partners received a short version of the survey that did not include these topics; two additional Partners who were interviewed as part of the exploratory survey development research that was performed early in the data collection period also were not asked these questions.

**Table 8-4. Partner Activities Before Becoming a Partner**

Activity	Percent of Respondents (n)	Percent of All Partners (n=34)
Provided energy efficiency services in the multifamily sector	74% (25/34)	74%
Energy efficiency services provided before becoming a Partner were similar to services provided after becoming a Partner	88% (22/25)	65%
Provided ERP-like service in multifamily sector	88% (22/25)	65%
ERP-like service included detailed cost and savings estimates	89% (17/19)	50%
Always recommended MPP-incented measures	68% (13/19)	38%

- In sum as shown in Table 8-5, 17 (50%) provided comprehensive ERP-like services that included cost and savings estimates, and 26% reported not providing energy efficiency services, including ERP-like services, before becoming a Partner. These Partners accounted for 133 (16%) MPP projects. Three Partners reported providing energy efficiency services, but not ERP-like services; these Partners accounted for 86 (11%) MPP projects. The majority of Partners (65%) reported providing both energy efficiency and ERP-like services before becoming a Partner; these Partners accounted for 589 (73%) MPP projects.

**Table 8-5. Partners and Projects by Type of Energy Efficiency Services Provided in the Multifamily Sector Before Becoming a Partner, MPP Versions 1-5**

Source: CRIS database, 12/20/2013.

Service Provided	Partners		MPP Projects	
	Number (n=34)	Percent Interviewed	Number (n=788) <sup>a</sup>	Percent of All Projects
Did not provide either ERP-like or other energy efficiency services in the multifamily sector before becoming a Partner	9	26%	133	16%
Did not provide ERP-like services, but did provide other energy efficiency services in the multifamily sector before becoming a Partner	3	9%	86	11%
Provided both ERP-like and other energy efficiency services in the multifamily sector before becoming a Partner	22	65%	589	73%
ERP was comprehensive (included cost and savings estimates)	17	50%	404	50%

### 8.3.1.2 Past Business Growth

- About two-thirds of all Partners who were asked<sup>167</sup> (66%, or 19 of 29), indicated they received more inquiries from multifamily clients *after becoming a Partner*, and about one-fourth of all Partners who were asked (23%, or 5 of 22) suggested that inquiries from multifamily clients increased *in the 2013 year*.
- More than half of Partners who were asked (57%, or 17 of 30) reported that their service territory for multifamily projects expanded over the past five years.
- In addition, 38% of Partners who were asked (11 of 29) reported that the number of their employees involved in multifamily projects had increased over the past five years.

### 8.3.1.3 Assessment of Awareness in the Market

- On average, less than three-fourths of Partners who were asked (72%, or 21 of 29) indicated that their multifamily clients had a low level of awareness of MPP. However, about half of all Partners who were asked (52%) said that client awareness has been increasing.
- Partners reported that the clients most attracted to energy efficiency included those involved in affordable housing, Class-A office buildings, cooperatives and condominiums, commercial and industrial buildings, municipal and institutional buildings (educational facilities, hospitals, and government offices), churches, and development and property management firms.
- Partners said the clients least receptive to energy efficiency were involved in affordable housing in which tenants pay utilities, smaller multifamily buildings, manufacturing, and retail. Partners mentioned two primary aspects of MPP that attracted clients: incentives and access to financing.

### 8.3.1.4 Spillover

- Slightly under three-fourths of Partners (72%, or 21 of 29) reported that, after becoming a Partner, they provided energy efficiency services to *non-multifamily* clients, and about two-thirds of Partners (69%) reported that they provided energy efficiency services to *non-MPP multifamily* clients (Table 8-6).

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<sup>167</sup> Seven Partners with whom the PE/MCA team conducted in-depth interviews, which formed the basis for designing the survey for the other Partners, were not asked all of the questions that the PE/MCA team included in the survey due to time constraints. Thus, the denominators were different for some of the results reported.

**Table 8-6. Partners' MPP Spillover Activities Since Becoming a Partner**

Activity	Percent (n)
Provided energy efficiency services to non-multifamily clients after becoming a Partner	72% (21/29)
Provided energy efficiency services to non-MPP multifamily clients after becoming a Partner	69% (20/29)
Provided ERP-like service to non-MPP multifamily clients after becoming a Partner	80% (16/20)
Used a modified version of NYSERDA's ERP	94% (15/16)
Got the same results from owners when modified ERP was used compared to when NYSERDA's ERP was used	80% (12/15)
Recommended MPP-incented measures to non-MPP clients	85% (17/20)
Worked in areas where MPP is unavailable	36% (8/22)
Recommended MPP-incented measures in non-MPP areas most of the time	75% (6/8)

- Non MPP multifamily clients, according to Partners, tended to be: owners of buildings too small for MPP (fewer than 5 units); clients seeking to comply with Local Laws; owners of condominiums and cooperatives; owners of buildings in which 15% savings could not be achieved; clients with cogeneration, solar systems, steam systems, or oil-fired heating; and student housing clients.
- Eighty percent of the Partners (16 of 20) who provided energy efficiency services to non-MPP multifamily clients reported providing ERP-type services, and a large majority of these Partners (94%) used a modified version of NYSERDA's ERP instead of NYSERDA's ERP (Table 8-6). Over three-fourths of the Partners providing an ERP (80%) reported that when they used the modified ERP, they got the same results regarding their non-MPP clients' understanding and actions taken as those they achieved when they used NYSERDA's ERP for their MPP clients (Table 8-6).
- Eighty-five percent of Partners (17 of 20) who provided energy efficiency services to non-MPP multifamily projects also reported recommending MPP-incented measures in the majority of these projects (Table 8-6).
- About one-third of Partners who were asked (36%, or 8 of 22) worked in areas outside the State, where MPP was unavailable (Table 8-6). Of the Partners working in areas where MPP was not offered, three-fourths (75%) indicated that they recommended MPP-incented measures most of the time in these areas (Table 8-6).

### 8.3.1.5 Attribution to MPP

- As shown in Table 8-7, slightly over three-fourths of Partners (76%, or 16 of 21) reported that, since becoming a Partner, they provided energy efficiency services to non-MPP clients *over and above the services they provided before becoming a Partner*. Thirty-one percent of Partners said they developed these services through their participation in MPP.

**Table 8-7. Partners' Attribution to MPP**

Attribution to MPP	Percent (n)
After becoming a Partner, provided energy efficiency services to non-MPP clients over and above the services provided before becoming a Partner	76% (16/21)
Developed additional services through MPP	31% (5/16)
MPP status contributed to getting non-MPP projects	64% (9/14)
Change in demand for services due to MPP:	
▪ Increased	39% (7/18)
▪ Stayed the same	50% (9/18)
▪ Decreased	7% (2/18)
Partner status contributed to an increase in demand for services from non-multifamily clients	5% (1/19)
Growth in multifamily employees due to MPP	21% (3/11)

- Partners provided additional services included: installing and/or servicing boilers, chillers, insulation, lighting, water-heating, and distribution systems; performing air sealing; doing fuel conversions and cogeneration projects; providing full-service energy consulting that included auditing, benchmarking, modeling, technology feasibility studies, and troubleshooting; providing engineering services; conducting retro-commissioning; providing construction management; and, instructing clients about energy efficiency benefits.
- When asked if MPP status contributed to obtaining similar projects outside of MPP, About two-thirds of Partners (64%, or 9 of 14) reported that their MPP status contributed to getting non-MPP projects (Table 8-7). In addition, 39% of Partners (7 of 18) reported that MPP increased demand in the multifamily market for their services; half (50%) did not notice any change and a small minority (7%) reported a decrease in demand (Table 8-7).

- Just one of 19 Partners (5%) commented that their Partner status contributed to an increase in demand for energy-efficient services from non-multifamily clients (Table 8-7).
- Less than one-fourth of Partners (21%) who reported an increase in the number of their employees reported that this increase was attributable to MPP (Table 8-7).

### 8.3.1.6 Free Ridership

- Seventy-four percent (14 of 19) indicated that they would provide an ERP and 86% (19 of 22) stated that they would recommend MPP-incented measures if they were unavailable from MPP.

### 8.3.2 Participant Activities

Summary: Before participating in MPP, most Participants had an energy audits performed for at least one of their buildings. However, less than a quarter had had an energy model performed. In addition, 23% reported spillover at the MPP property for which they were interviewed.

#### 8.3.2.1 Prior to MPP Participation

- Sixty-nine percent of participants (76 of 110) service non-MPP multifamily properties. Two-thirds of these participants sought advice on energy upgrade options for their properties before they participated in MPP (Table 8-8).

**Table 8-8. Participants' Energy-Efficient Activities in Non-MPP Multifamily Properties Prior to Participation in MPP**

Activity	Percent
Have multifamily properties that have not gone through MPP	69% of the sample of 110
Sought advice on energy upgrades at a non-MPP multifamily property before involvement in MPP	66% (45% of sample)
Engaged in an energy efficiency activity at a non-MPP multifamily property before involvement in MPP	85% (59% of sample)
Very knowledgeable about how to reduce energy usage prior to involvement in MPP	31% (21% of sample)

- A large majority (85%) of these participants also engaged in an energy efficiency activity in their property before participating in MPP (Table 8-8); however, less than one-quarter of participants had performed whole building energy modeling (23%) or pursued LEED certification (23%). Over three-quarters of participants had upgraded some part of their building to be more energy-efficient and over half (53%) had developed a plan to reduce energy use in their building.
- Among contacts in the participant sample who reported engaging in any energy efficiency activities prior to participating in MPP (59%, or 65 of 110), 32% (17% of sample) incorporated energy efficiency measures into a multifamily building based on a comprehensive energy

assessment. Of the 87 existing building participants in the Impact sample, 39% had a non-MPP energy audit completed at their property in the previous 10 years; 76% of them said the audit was comprehensive.

- Nine participants were able to report the energy savings achieved from the installed measures, which averaged 25.6%, and ranged from 14% to 50%.
- About one-third (31%) of participants with non-MPP properties rated themselves “very knowledgeable” about how to reduce energy use in these properties prior to participating in MPP (Table 8-8).

### 8.3.2.2 Spillover

- As shown in Table 8-9, among participants in the sample with completed projects, six (23%) had pursued additional efficiency measures at the MPP property after construction was complete (Table 8-9). Three of these participants reported that their association with MPP and/or Partner influenced their decision to implement additional energy efficiency measures.

**Table 8-9. Participant MPP Spillover Activities**

MPP Activity	Percent (n)
Somewhat or strongly inclined to implement energy efficiency measures in non-MPP properties after involvement in MPP	93% (70/76)
Pursued additional energy-efficient measures in multifamily property after MPP project was completed	23% (6/26)
Installed energy-efficient measure at non-MPP multifamily existing building property after involvement in MPP	67% (20/30)
Association with MPP and/or Partner influenced decision to install energy-efficient measure after involvement in MPP	45% (9/20)

- Among participants who owned or managed an existing building in New York State, 20 (67%) installed energy efficiency measures at a multifamily property after they became involved with MPP for the first time (Table 8-9). Of these, nine participants (45%) reported that their association with MPP and/or Partner influenced their decision to implement additional energy efficiency measures (Table 8-9).
- Fifteen percent of participants said the building their firm had owned or managed the longest, and that had not gone through MPP, had never been renovated; 17% reported that the building was undergoing renovations, and 20% did not know the last time the building had been renovated. Among the participants who knew details about the last time this property had been renovated, over half said the most recent renovation included upgrades to heating and cooling (55%), interior



lighting in common areas (69%), and exterior lighting (53%). Over one-fourth of these participants (29%) received incentives for the upgrades.

### 8.3.3 Market Actor Activities

**Summary:** This report has noted that the market actor surveys will need to be fielded again because of sampling issues. The results rely upon Dodge list of market actors that may not include the full population of market actors that do or could potentially provide energy efficiency services to the multifamily sector. The study also did not include Partners in the NYS sample, so that the NYS and PA samples are not equivalent.

The results, though limited by the sampling issues, do show that there is some market actor activity in providing energy efficiency to multifamily properties, but the energy efficiency activities provided by market actors are most often not as comprehensive as those provided by Partners in MPP. Less than half of the market actors in the call lists reported involvement in the multifamily sector in NYS in the past five years (compared to less than one-third in PA). The majority of these market actors in both states reported involvement in new construction or existing building multifamily projects in the past two years, but only a small minority (13-14% in NYS and 12% in PA) reported always providing ERP-like services to their multifamily projects. In addition, about half of the market actors reported awareness of MPP and less than half of these reported involvement in an MPP-supported project. Majorities of market actors in both states also reported an increased interest in energy efficiency among their clients, which contributed to an increase in their multifamily energy efficiency business.

#### 8.3.3.1 Key Findings

- **Work in Multifamily Sector:** In New York State, 42% of market actors – architects, engineers, contractors, and energy efficiency consultants (EE consultants) – had worked in the multifamily sector in the previous five years, compared to 31% in Pennsylvania.
- **New Construction:** The majority of these market actors in both New York State (62%) and Pennsylvania (61%) also had been involved in multifamily *new construction* projects in the previous two years. However, only 4% of New York State and 2% of Pennsylvania market actors reported always recommending energy efficient products and conducting an energy model in their new construction projects.
- **Existing Buildings:** The majority of market actors in both New York State (62%) and Pennsylvania (55%) had been involved in multifamily *existing building* projects in the previous two years, while only 6% of New York State and 12% of Pennsylvania market actors always addressed energy efficiency products and conducted auditing activities in existing building projects.
- **Overall:** Ten percent of New York State market actors provided ERP-like services to most of their multifamily projects, compared to 12% in Pennsylvania. Including MPP Partners who were

screened from the survey, between 13% and 14% of New York State market actors provided ERP-like services to most of their multifamily projects.

- **MPP Awareness:** Slightly more than half of New York State market actors (53%) reported awareness of MPP. Less than half of these New York State market actors (41%, and 22% of all State market actors) reported being involved in a project supported by MPP.

**Multifamily Market Effects:** A large majority (82%) of New York State market actors said they have noticed that multifamily developers, owners, or managers had increased their effort to make their buildings more energy-efficient; 76% of the market actors in Pennsylvania made a similar observation. Over half of these New York State market actors (56%) also reported that the increased interest among building owners had increased the amount of multifamily energy efficiency work they did in the State, compared to 52% in Pennsylvania. Almost half of these New York State firms (49%) began specifying new energy-efficient technologies to meet the increased interest, compared to 32% in Pennsylvania. In addition, one-fourth of New York State firms stated that the percentage of their New York State employees engaged in multifamily energy efficiency work had increased over the previous five years, compared to 19% in Pennsylvania.

## 8.4 Process Findings

The review of the MPP logic model, features, and processes reveals a well-conceived and well-administered program with no major issues. MPP has many features that match or define best practices among multifamily initiatives in the U.S.

### 8.4.1 MPP Strengths

MPP's design and operation provide excellent models for other multifamily programs across the U.S. Designing effective multifamily energy efficiency programs has been challenging for the energy efficiency industry, especially compared to other sectors.

- MPP has successfully addressed two primary factors that exacerbate program design: the existence of the landlord/tenant split incentive and the need to design a comprehensive program that works across traditional residential and commercial program sectors. Not only has NYSERDA designed a single program for commercial and residential accounts, but also for new and existing buildings – both important accomplishments.
- MPP is successfully delivering large energy resource savings for New York State. So far, in version 5 projects alone, MPP accounted for 6,228,556 kWh and 123,238 therms of lifetime savings.

- MPP's more important accomplishment may be the market-transforming development of a set of energy efficiency service providers (Partners) capable of providing independent and comprehensive energy efficiency advice to multifamily building owners and managers. From the program's inception, MPP staff has recognized that the multifamily market lacked such a group of service providers, who would function like the BPI-certified Home Performance professionals that serve the single-family market. This evaluation's baseline research, summarized in the above subsection, confirms that prior to MPP there were few market actors providing this level of comprehensive service to the multifamily sector.
- MPP's exceptional structure and management allow staff to plan strategically, set challenging goals, establish and implement effective communication links, track performance, and proactively address potential issues.
- MPP's strong communication processes include monthly "all-hands" meetings, which facilitate communication between program staff and outside contractors. Meetings foster a cohesive sharing of accomplishments and challenges, and exchanges of ideas to address specific program issues and program expansion. Task responsibilities appear to be clearly defined and delegated broadly among the staff.
- MPP is unique in that it places a priority on obtaining critical program feedback and considering the program's strategic direction. MPP recognized a need for feedback from participants, so staff developed a real-time survey process to automatically send invitations to a web survey to participants when they pass important program milestones. MPP is also engaged in long-term strategic planning that has identified a set of strategies the program must develop to achieve the long-term goal of reaching the broad multifamily market.
- MPP has developed an effective organizational structure and support tools that make MPP a model for efficiency programs in all sectors. QA/QC is sufficient without being burdensome. The program's marketing support, particularly the use of the Web to differentiate leads and to deliver targeted messages to prospective owners, is an innovative marketing tool with application to many types of programs.
- MPP has a well-conceived process for recruiting Partners, maintaining and supporting their involvement, overseeing their work, and supplying technical support as needed. Partners have direct access to program implementation contractors and staff who can answer program-related and technical questions. MPP annual summits, numerous training activities, marketing materials and website, and other outreach and support services were very important to most Partners.
- MPP's senior staff involvement in the administration of projects is a large benefit to program administration. In addition to their primary responsibilities, most senior staff manages individual

existing building projects. Through this close involvement with Partners and building owners/managers, all staff maintain real-world and real-time engagement in and awareness of the program during each step of the process – from project development to application submission, energy reduction plan development and implementation, project completion, and payment of incentives.

#### 8.4.2 MPP Opportunities

Partners shared some concerns about the program. Most of these – particularly concerns about excess paperwork – are common among energy efficiency programs. MPP staff already was aware of some of these concerns and had addressed a few of them, such as updating the Partner Portal and introducing a Fast Track path. The issues mentioned by multiple Partners were the following:

- The profitability of participating in MPP also is a serious issue for the program. The market is not yet developed enough to where most owners recognize the value of MPP services, and as a result, Partners need to invest large amounts of uncompensated time and money in educating owners. The two most successful Partners acknowledged that their MPP projects could not be profitable unless they used MPP to leverage additional work (project management and air sealing).
- Some Partners experienced delays in application sign-off and approval, and in ERP approval. Partners reported that some of the delays were caused by challenges in getting access to utility data and into tenant spaces; and others were delays caused by owner or Partner and not MPP staff. Two Partners said that reviews of their ERPs differed per the individual manager.
- Partners were concerned about the level of detailed analysis and paperwork required in general, and particularly for the application and ERP. Most Partners said they were not accustomed to doing the required levels of energy modeling and analysis for a standard project to ensure the program provides comprehensive and reliable results. Nor had they used the tools supported by MPP, which several described as too complicated.
- Over half of all Partners (56%) reported that the hiatus in MPP between July 2009 and September 2010 negatively affected their business. Of these, about one-third experienced significant project delays and about two-thirds lost both clients and projects. Partners had to inform clients about the hiatus, which made it more difficult to retain clients and maintain their trust after the hiatus. About half of the Partners suggested that the hiatus eroded their trust in the program and that the event had lasting negative impacts. As a result, they had not pursued MPP projects as aggressively or recommended MPP to their clients as frequently.
- About half of all interviewed Partners (45%) were not actively working in MPP version 5. Fifty-five percent of Partners inactive in version 5 reported that they could not make a profit recruiting and providing MPP services under the current payment structure; 45% said they were busy with

non-MPP work, and 23% had had a problem with a previous MPP project and were no longer interested in participating.

- Partners commented that their MPP projects faced significant competition from utility programs that did not require at least a 15% reduction in energy use. For example, 12 Partners indicated that if incentives from another program covered more of the costs of the measures their client wanted, they would recommend these programs instead of MPP.
- Participants were sometimes unaware of or confused about the MPP processes. To some extent, this reflects the fact that Partners are sheltering participants from most of the program process responsibilities. The website provides detailed information on all the MPP benefits and requirements so that motivated Partners should have access to all the information they would need. Only two Partners reported projects that made use of GJGNY financing. Of the participants who sought any type of financing, more than-three quarters had either not heard of GJGNY or did not have sufficient information to apply for GJGNY financing.
- The four Partners who reported using the Fast Track path noted that it is streamlined but not “faster” than the Standard path.



## 9 Findings & Recommendations

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### 9.1 Overview:

MPP represents one of the most successful and best designed multifamily programs in the U.S. It has successfully delivered large energy savings for New York State. However, there is still much potential for MPP to increase its penetration of the multifamily market in the State. Most of this potential is found in urban counties, particularly downstate, and Partners have been most active in these counties. Within buildings, there appears to be unrealized potential for savings in tenant spaces (only 4% of MPP savings have been in tenant spaces). Many buildings also have achieved more than 15% savings, partially due to the Performance Payment.

A minority of Partners has been responsible for the majority of MPP projects, but most Partners have been active in promoting MPP to potential clients. In fact, several Partners reported that MPP has been effective at increasing their business. Before joining MPP, about half of Partners were providing ERP-like services, so MPP has been successful in training many Partners to provide energy efficiency services to multifamily buildings. Very few Partners reported achieving 15% savings in their projects before they began participating in MPP, and their experience in MPP has been effective in increasing the savings per project they have learned to achieve through the program. Many Partners also have been offering MPP-like services in non-MPP multifamily projects and, to a lesser extent, in non-multifamily projects.

Most Partners see a low awareness and demand for energy efficiency services among multifamily building owners and managers, though the majority do see some increase in demand. To generate new projects in MPP, Partners often spend uncompensated time selling the program to potential clients. Partners also noticed that many clients are reluctant to commit to saving at least 15% savings “all at once,” so the Partners had to screen these clients out of the program.

Most of those who were Partners in 2009 said that MPP’s hiatus was very challenging for their business; many Partners lost clients and had to try to rebuild trust in the program. Other common concerns about the program include: excessive and complicated paperwork; delays in submission and approval of applications and ERPs; complex benchmarking and modeling tools with steep learning curves; competition from utility programs; and unprofitable projects.

MPP staff has been responsive to concerns from Partners and others, and the structure of MPP’s management and administration has been crucial in enabling this. Regular strategic meetings, feedback surveys, performance tracking, involvement of senior staff in projects, marketing support, and annual summits have been effective in addressing problems and issues, and in planning long-term program improvements.

A large minority of MPP participants have had more than one building supported by MPP, which indicates that many participants have returned to the program. A large majority said they were “strongly inclined” to incorporate energy efficiency in other buildings after participating in the program.

Less than half of the New York State market actors (who were not Partners) and less than one-third of Pennsylvania market actors reported involvement in the multifamily sector in the past five years. A small minority in both states said they always recommended MPP-like measures and performed ERP-like services in new construction and existing building projects, but many reported increasing the frequency of these activities in the past five years. Over half of New York State market actors were aware of MPP and about one-fourth reported working on an MPP-supported project. Half of those who worked on an MPP project reported that MPP increased their company’s promotion of energy efficiency in general.

In sum, the PE/MCA team finds that MPP is an exceptional program with an effective design, strong leadership, and well-functioning processes. MPP serves as a model for other multifamily programs seeking to transform the challenging multifamily energy efficiency market. MPP can make improvements to increase its effectiveness. These improvements center around persistent barriers that keep owners from fully investing in energy efficiency in their properties and that make it difficult for market actors to serve this sector profitably. In the remainder of this section, the evaluation team identifies program improvements and offers ideas MPP could implement to address these issues.

## 9.2 Conclusions and Recommendations

### 9.2.1 Conclusion 1: Energy Efficiency Opportunities Exist in Tenant Spaces

The evidence indicates that the vast majority of measures were installed in common areas and not in tenant spaces. Despite the program’s earnest efforts, only 4% of the energy savings for versions 4 and 5 have been installed in tenant spaces. Most surprising is the fact that investment in tenant spaces in affordable-rate projects is also very low (3%). Even the higher incentive levels that are available for affordable-rate projects appear to be insufficient to overcome the landlord/tenant split incentive barrier.

MPP is not alone in its inability to overcome the split incentive barrier. To date, only programs that pay 100% of the costs for measures in tenant spaces have succeeded in achieving substantial penetration. This may be a course that MPP may eventually need to consider; however, there are several less drastic approaches that merit consideration.

New York City (PLANYC) and the Urban Green Council have developed an energy-aligned clause (EAC) that helps mitigate the landlord/tenant split incentive barrier. The EAC allows landlords to raise the rent to pay for energy efficiency measures that save energy. The clause ensures that the rent increase will never be higher than the monthly savings in energy.



- **Recommendation 1-A: Differentiate between and encourage improvements in tenant and common spaces.** Multifamily programs should more effectively differentiate energy-efficient measures done in tenant spaces and that lower tenant bills from those done in common areas or in master metered areas that lower owners' bills. Acknowledging that there may be less opportunities that may come at a higher cost in comparison to common area improvements, where incentives are offered, programs could make the incentives for tenant space measures larger than those for measures in common spaces to provide this differentiation and encouragement of greater savings for tenants.
- **Recommendation 1-B: Consider using the energy aligned clause to mitigate the landlord/tenant split incentive barrier.** Multifamily programs may employ the energy aligned clause (EAC) developed by New York City (PlaNYC) and the Urban Green Council to help mitigate the landlord/tenant split incentive barrier. The EAC allows landlords to raise rents to pay for measures that save energy. The clause ensures that rent increases will never exceed the monthly energy savings. The program operator could develop an incentive structure that encourages projects, particularly new buildings, to include EACs as part of their leasing structure. The program operator also could consider facilitating the process by agreeing to serve as a neutral party to calculate or verify bill reductions.

## 9.2.2 Conclusion 2: Greater Savings Can Be Achieved

The performance incentive for savings above 20% has been one of the most successful components of MPP in existing buildings. The interviews suggest that the 20% threshold pushes some owners to achieve extra savings. According to staff, some building owners and managers are motivated by the opportunity to earn additional funds by increasing their savings amount to above 20%.

MPP's strategic planning seeks to create a differentiated market where potential renters are able to distinguish an energy-efficient apartment unit from a normal apartment unit. Interviews indicate that LEED has lost some of its attraction as a means of distinguishing the superior energy efficiency of a building. Rewarding and promoting those building with the highest achievement is a way of confirming the differentiation between efficient and non-efficient buildings.

- **Recommendation 2-A: Consider encouraging projects to achieve savings greater than 15% in new construction.** Multifamily programs should consider creating graduated incentives for new construction building owners willing to save 20%, 25%, 30%, or more.
- **Recommendation 2-B: Consider special recognition for building owners achieving the highest levels of savings.** Giving a means for owners to distinguish their building from others is an important component of establishing a market for energy efficiency in rental properties. The

more publicity that a program gives to truly efficient buildings, the quicker that market push can develop.

- **Recommendation 2-C: Work with PLANYC<sup>168</sup> to disseminate benchmarking results.** To date, benchmark data that would serve to help differentiate efficient and non-efficient apartment units has been unavailable to the program and to this evaluation.

### 9.2.3 Conclusion 3: Many Potential Participants Are Not Currently Ready to Fully Commit to the 15% Minimum Savings Requirement

A major barrier to greater Partner participation is competition from utility programs that allow owners and managers incentives for single measures. Partners also found it difficult to convince owners and managers to sign up for a program that requires the 15% reduction threshold as a minimum. Selling the “whole 15% savings or nothing” is not an ideal sales approach for Partners targeting new client building owners. Many uninformed or reluctant potential owners and managers will be unwilling to commit to going for such a comprehensive project without first testing the Partner’s abilities and the program’s claims. For many owners and managers, the MPP 15% minimum savings requirement is too risky of an investment, given that owners and managers have no previous experience in working with the MPP or the Partner.

- **Recommendation 3: Consider allowing gradual achievement of the 15% threshold and coordinating with utility incentives.** Setting tough minimum threshold levels is a positive step that makes sure that buildings are not just taking the easy steps; however, multifamily program administrators should consider allowing projects to achieve the 15% minimum more gradually. Under this revised process, the ERP plan could be achieved more gradually. If the plan included measures incentivized by other programs, these could count toward the 15% threshold. However, a Partner could not receive the program incentive until the sum of measures reaches the 15% threshold. The MPP incentive could also be reduced by any incentives already received from other sources. This approach has two major benefits: 1) it provides a means of coordinating NYSERDA programs with those offered by the utilities; a strategy that is consistent with the direction expressed in the recent NYDPS decision<sup>169</sup>; and 2) the more gradual and easily marketed approach provides a means for Partners to attract reluctant owners and managers.

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<sup>168</sup> PLANYC Green Building and Energy Efficiency is managed by the Mayor's Office of Long-Term Planning and Sustainability (OLTPS) see <http://www.nyc.gov/html/gbee/html/about/about.shtml>

<sup>169</sup> [http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/26be8a93967e604785257cc40066b91a/\\$FILE/ATTK0J3L.pdf/Reforming%20The%20Energy%20Vision%20\(REV\)%20REPORT%204.25.%2014.pdf](http://www3.dps.ny.gov/W/PSCWeb.nsf/96f0fec0b45a3c6485257688006a701a/26be8a93967e604785257cc40066b91a/$FILE/ATTK0J3L.pdf/Reforming%20The%20Energy%20Vision%20(REV)%20REPORT%204.25.%2014.pdf)

#### 9.2.4 Conclusion 4: Increasing Market Adoption of Energy Efficiency in the Multifamily Sector Will Require More Educational Outreach to Owners

The current MPP is reaching the most informed and motivated owners; with the vast majority of the remaining multifamily property owners still unaware of or convinced that MPP services are worthwhile. Supporting owner education is a critical component of a market transforming strategy. Because owners have not traditionally invested in energy efficiency consultation services and rely primarily on vendor advice, they are reluctant to pay up front for services offered by MPP partners. Most commonly, the vendors provide free consultation service because they profit when equipment is purchased. The current program approach places the responsibility of marketing, outreach and recruitment primarily on Partners. Under the current model, the Partners are compensated for a portion of the audit expense and not directly compensated for providing marketing, outreach and recruitment services. This approach results in minimal profitability for the Partner firm and an unsustainable business model. A resulting consequence is that most Partners perform very little marketing of the program.

- **Recommendation 4: Expand marketing of program to multifamily property owners and managers.** Multifamily programs would benefit from expanding the marketing and outreach to multifamily property owners or property managers to educate them on the benefits of investing in energy consultation services. The program can assume responsibility for marketing and outreach efforts; or the program can continue to rely on Partners to promote the program. If a program chooses the latter, the incentive structure will need to be revisited to give Partners more compensation for undertaking marketing services. This compensation could be a direct payment for marketing services or a finder's fee for successful recruitment of new participants. This compensation should be gradually phased out as the market develops and more owners gain an appreciation for program services. If the program interventions change over time the concept of providing education and outreach to prop owners or managers should still be considered as a strategy for achieving market adoption of energy efficiency in the multifamily sector.



## Appendix A. Survey Instruments

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### NYSERDA MPP Market Actor Survey: New York & Pennsylvania

#### Notes to Interviewer

- Read all answer categories unless otherwise instructed.
- Program all multiple response questions as dichotomous variables.
- Suggest pre-code option for open-ended questions after achieving 30% of completes. Implement after approval by Research Into Action.
- Post-pretesting, notify Research Into Action regarding any questions that do not appear to be collecting the intended information.

#### Database Inputs

##### **Architects/Engineers/Contractors-Builders/Energy Efficiency Consultants**

**Firm Name:**

**Firm Multifamily Contact Name:**

**Firm Telephone #:**

**Firm Type (ACE, AE, AC, or A):**

**Firm Location (D or U):**

#### Screening [ALL]

- S1) Do you have a few minutes to provide your knowledge and insight? It can have a meaningful impact on the future of NYSERDA's programs and incentives since the results of the study will help NYSERDA adapt its programs to continue supporting multifamily clients in incorporating energy efficient options in their buildings. This is not a sales call and the information you provide will be kept confidential to the extent permitted by law.

1\_Yes

2\_No, Callback later → Schedule Callback

9 = (VOL) Refused / Will Not Participate → Thank and Terminate

**(SKIP S2 IF ALREADY ANSWERED)**

- S2) Great! In the past five years, has your firm provided services to multifamily buildings with five or more units in New York State?

1\_Yes

2\_No → Thanks/Terminate

8 = (VOL) Don't Know

9 = (VOL) Refused → Thanks/Terminate

- S3) How would you describe or categorize your current position? Are you... (READ)

[INTERVIEWER NOTE: IF RESPONDENT SAYS THEIR POSITION INVOLVES MORE THAN ONE OF THE FIRST FOUR ANSWER CHOICES (FOR EXAMPLE, ARCHITECT, AND ENGINEER), CHOOSE 5. OTHER SPECIFY]

1 = an Architect,

2 = an Engineer,

3 = A Contractor or Builder,

4 = an Energy Efficiency Consultant, or

5= some other type of position (specify)? → ASK S3a.

9 = (VOL) Refused → Thanks/Terminate

- S3a. Is your background primarily in... (READ)?

1 = Architecture,

2 = Engineering,

3 = Building Construction,

4 = Energy Efficiency Consulting, or

5 = None of these? → ASK S3a1.

9 = (VOL) Refused → Thanks/Terminate

- S3a1. For this survey, we are looking to interview an Architect, an Engineer, a Contractor/Builder, or an Energy Efficiency Consultant who is knowledgeable about the firm's multifamily services and projects. Does your firm currently have any such person that we could speak with today?

[INTERVIEWER NOTE: IF INFORMANT DOESN'T GIVE NEW PHONE NUMBER AND JUST TRANSFERS YOU, TYPE IN PHONE NUMBER AT THE TOP OF THIS SCREEN]

1 = Yes / Transferred to New Person / Given Phone # for New Person

2 = No, there is NO ONE at this firm at any of those positions → Thanks/Terminate

9 = (VOL) Refused → Thanks/Terminate

- S3a1a. Before you go, may I have your first name in case your colleague cares to know who referred you to me to them? [OPEN END] \_\_\_\_\_

- S3a2. Hello, my name is <NAME>. I am calling on behalf of NYSERDA, the New York State Energy & Research Development Authority, to talk with architects, engineers, contractor/builders, or energy efficiency consultants at firms like yours about the services they provide to multifamily developers and owners. I was told by one of your co-workers that you may be able to help us with our survey. This is not a sales call and the information you provide will be kept confidential to the extent permitted by law.

1 = CONTINUE → **GO BACK TO S1**

- S4) We certainly appreciate your help thus far. However, we have already interviewed the maximum number of (*insert from S3/S3a*)s for this project. Is there (*insert S4 read-in*) at your firm that we could speak with who also is knowledgeable about the services your firm provides to multi-family buildings or projects?

**S4 read-in:**

- **IF (S3=1 or S3a=1) ....**
  - **insert “an Engineer, a Contractor/ Builder, or an Energy Efficiency Consultant”**
- **IF (S3=2 or S3a=2) ....**
  - **insert “an Architect, a Contractor/Builder, or an Energy Efficiency Consultant”**
- **IF (S3=3 or S3a=3) ....**
  - **insert “an Architect, an Engineer, or an Energy Efficiency Consultant”**
- **IF (S3=4 or S3a=4)...**
  - **insert “An Architect, an Engineer, or a Contractor/Builder”**

1 = Yes / Transferred to New Person / Given Phone # for New Person

2 = No / There are no other personnel of that type in this firm → Thanks/Terminate

3 = (VOL) Refused → Thanks/Terminate

S4a1a. Before you go, may I have your first name in case your colleague cares to know who referred you me to them? [OPEN END] \_\_\_\_\_

(**IF S4=1, ASK S5.**)

- S5) Hello, my name is <NAME>. I am calling on behalf of NYSERDA, the New York State Energy & Research Development Authority, to talk with [SELECT BASED ON GROUP: architects/engineers/contractors/energy efficiency consultants] at firms like yours about the services they provide to multifamily developers and owners. I was told by one of your co-workers that you may be able to help us with our survey. This is not a sales call and the information you provide will be kept confidential to the extent permitted by law.

1 = CONTINUE → **GO BACK TO S1**

- Q1. [NY & PA] Great! First, how long have you been working in your industry? [READ ANSWER CHOICES]

**[INTERVIEWER NOTE: IF RESPONDENT CHOOSES ONE OF THE OVERLAPPING CATEGORIES, PROBE FOR CLARITY.]**

1\_Less than one year

2\_1 – 2 years

3\_3 – 4 years

4\_5 – 9 years

5\_10+ years

8 = (VOL) Don't Know

9 = (VOL) Refused

- Q3. [NY & PA] How long has your firm been providing services to multifamily buildings that have five or more units in New York State/Pennsylvania? [READ ANSWER CHOICES]

**[INTERVIEWER NOTE: IF RESPONDENT CHOOSES ONE OF THE OVERLAPPING CATEGORIES, PROBE FOR CLARITY.]**

- 1\_ Less than one year
- 2\_ 1-2 years
- 3\_ 3-4 years
- 4\_ Five or more
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

## General and Multifamily Services

- Q4. [NY & PA] For the next question, I will ask about different services your firm might or might not provide *in general* and *for multifamily projects specifically in New York State/Pennsylvania*.

Please answer yes or no to each of the following.

Do you provide <INSERT ITEM> in general? And in multifamily projects?

[CATI NOTE: IF 'GENERAL' ITEMS ARE ANSWERED 'NO', 'DK', OR 'REF', SKIP MULTIFAMILY ITEM]

	<u>1. General</u>			<u>2. Multifamily</u>		
a. New building construction	1_Yes	2_No	DK	1_Yes	2_No	DK
b. Renovation/Remodeling	1_Yes	2_No	DK	1_Yes	2_No	DK
c. New building architectural design	1_Yes	2_No	DK	1_Yes	2_No	DK
d. Retrofit architectural design	1_Yes	2_No	DK	1_Yes	2_No	DK
e. Project oversight	1_Yes	2_No	DK	1_Yes	2_No	DK
f. New building engineering design	1_Yes	2_No	DK	1_Yes	2_No	DK
[PROBE: structural, mechanical, or electrical engineering]						
g. Retrofit engineering design	1_Yes	2_No	DK	1_Yes	2_No	DK
[PROBE: structural, mechanical, or electrical engineering]						
h. Retro commissioning services	1_Yes	2_No	DK	1_Yes	2_No	DK
i. Building or system energy audits	1_Yes	2_No	DK	1_Yes	2_No	DK
j. LEED building design	1_Yes	2_No	DK	1_Yes	2_No	DK
[INTERVIEWER NOTE: LEED stands for The Leadership in Energy and Environmental Design, which is a building program created by the U.S. Green Building Council to provide third-party verification of green buildings.]						
k. Whole building energy modeling	1_Yes	2_No	DK	1_Yes	2_No	DK
l. Installation of equipment	1_Yes	2_No	DK	1_Yes	2_No	DK
m. Other [please specify:] _____						

- Q5. [NY & PA] Are you aware of the Building Performance Institute's Multifamily Building Analyst Certification?

- 1\_ Yes
- 2\_ No
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused



- Q6. [NY & PA] [IF Q5 = YES] Does someone in your firm have that certification?
- 1\_Yes  
2\_No  
8 = (VOL) Don't Know  
9 = (VOL) Refused
- Q7. [NY & PA] In the past five years, has your firm provided any of these services to multifamily buildings in New York/Pennsylvania that were...**(INSERT ITEM)**?
- a. New construction and gut rehab projects      1\_Yes   2\_No   8\_DK   9\_REF  
b. Existing building upgrades or retrofits      1\_Yes   2\_No   8\_DK   9\_REF

### New Construction Questions

- Q8. [NY & PA] [IF Q7a = YES, ELSE SKIP TO Q25] Now, I want to ask about your firm's involvement in new multifamily construction and gut rehab projects during the past two years in New York State/Pennsylvania. How many multifamily new construction and gut rehab projects has your firm been involved in during the past two years?

(RANGE= 0 to 1000; 9998=DK, 9999=REF)

\_\_ new construction and gut rehab projects [IF Q8=1, ASK Q9.] [If Q8 = 0, SKIP to Q25]  
[If Q8 > 1, SKIP to Q15] [IF Q8=DK or REF, ASK Q8a.]

- Q8a. [NY & PA] Would you say it is...(READ)?
- 1 = only one,  
2 = more than one, or  
3 = none?  
8 = (VOL) Don't Know  
9 = (VOL) Refused

[IF Q8a=1, ASK Q9. IF Q8a=2, SKIP TO Q15. IF Q8a=3, DK or REF, SKIP TO Q25.]

- Q9. [NY & PA] [IF Q8 = 1 or Q8a=1] Was this project pursuing a LEED certification?
- 1\_Yes  
2\_No  
8 = (VOL) Don't Know  
9 = (VOL) Refused

- Q10A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANTS] [IF Q8 = 1 or Q8a=1] Did your firm develop a simulation model of building energy usage for this project?
- 1\_Yes  
2\_No → SKIP TO Q12A  
8 = (VOL) Don't Know → SKIP TO Q12A  
9 = (VOL) Refused → SKIP TO Q12A

Q10B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q8 = 1 or Q8a=1] Was a simulation model of energy usage developed for the multifamily building project you worked on in the past two years?

1\_Yes

2\_No → SKIP TO Q12B

8 = (VOL) Don't Know → SKIP TO Q12B

9 = (VOL) Refused → SKIP TO Q12B

Q10B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q10B = YES] Did your firm or someone else develop the energy usage model?

[PROBE: architect, engineer, energy consultant]

1\_Respondent's firm

2\_Someone else [please specify:] \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q11. [NY & PA] [IF Q10A OR Q10B = YES] To your knowledge, did the building owner adopt the energy usage model's recommendations completely, partially, or not at all?

1\_Completely

2\_Partially

3\_Not at all

8 = (VOL) Don't Know

9 = (VOL) Refused

Q12A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q8 = 1 or Q8a=1] Did your firm look for opportunities to exceed energy building codes for equipment or insulation?

1\_Yes

2\_No → SKIP TO Q14

8 = (VOL) Don't Know → SKIP TO Q14

9 = (VOL) Refused → SKIP TO Q14

Q12B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q8 = 1 or Q8a=1] Were opportunities to exceed energy building codes for equipment or insulation identified?

1\_Yes

2\_No → SKIP TO Q14

8 = (VOL) Don't Know → SKIP TO Q14

9 = (VOL) Refused → SKIP TO Q14

Q12B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] Did your firm or someone else identify these opportunities?

[PROBE: architect, engineer, energy consultant]

1\_Respondent's firm

2\_Another firm [please specify]: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q13A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF (Q8 = 1 or Q8a=1) AND Q12A = YES] Which of the following measures did your firm specify that exceeded energy codes? [Please answer Yes or No]

a. Lighting	1_Yes	2_No	8_DK	9_REF
b. Heating	1_Yes	2_No	8_DK	9_REF
c. Cooling	1_Yes	2_No	8_DK	9_REF
d. Water heating	1_Yes	2_No	8_DK	9_REF
e. Insulation	1_Yes	2_No	8_DK	9_REF

Q13B. [NY & PA] [FOR CONTRACTORS-BUILDERS ONLY] [IF (Q8 = 1 or Q8a=1) AND Q12B = YES] Which of the following measures did [“your firm” / (insert verbatim from Q12b.1)] specify that exceeded energy codes? [Please answer Yes or No]

a. Lighting	1_Yes	2_No	8_DK	9_REF
b. Heating	1_Yes	2_No	8_DK	9_REF
c. Cooling	1_Yes	2_No	8_DK	9_REF
d. Water heating	1_Yes	2_No	8_DK	9_REF
e. Insulation	1_Yes	2_No	8_DK	9_REF

Q14. [NY & PA] [IF Q10a OR Q10b OR Q12a OR Q12b = YES, ELSE SKIP TO Q25] Overall, did this project exceed energy codes by 15 percent or more?

1\_Yes  
2\_No  
8 = (VOL) Don't Know  
9 = (VOL) Refused

**[IF (Q8 =1 or Q8a=1) SKIP TO Q25]**

Q15. [NY & PA] [IF Q7a = YES AND (Q8 > 1 or Q8a=2)] In how many of these projects were you pursuing a LEED certification?

(RANGE= 0 to 1000; 9998=DK, 9999=REF)

\_\_\_\_\_ LEED projects

Q16A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF (Q8 > 1 or Q8a=2)] For all of the multifamily new construction and gut rehab projects you worked on in the past two years, how often, if at all, did your firm develop a simulation model of building energy usage? [READ ANSWER CHOICES]

1\_Never → SKIP TO Q20a  
2\_Rarely  
3\_Sometimes  
4\_Often  
5\_Always  
8 = (VOL) Don't Know → SKIP TO Q20a  
9 = (VOL) Refused → SKIP TO Q20a

Q16B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF (Q8 > 1 or Q8a=2)] For the multifamily new construction and gut rehab projects you worked on in the past two years, how often, if at all, was a simulation model of building energy usage developed? [READ ANSWER CHOICES]

- 1\_Never → SKIP TO Q20b
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know → SKIP TO Q20b
- 9 = (VOL) Refused → SKIP TO Q20b

Q16B.1 [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q16B ≠ NEVER OR DK OR REF] How often did your firm develop the model versus another firm like the architect, engineer, or energy consultant? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q17. [NY & PA] [IF Q16A OR Q16B ≠ NEVER OR DK OR REF] To your knowledge, how often, if at all, were the model's recommendations adopted by the owner? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q18. [NY & PA] [IF Q3 = 5+ years AND (Q8 > 1 or Q8a=2) AND (Q16A OR Q16B ≠ NEVER OR DK OR REF), ELSE SKIP TO Q20A OR Q20B] Compared to five years ago, does your firm model energy usage... ?

[READ CHOICES]

- 1\_More frequently
- 2\_About the same → SKIP TO Q20A/B
- 3\_Less frequently
- 8 = (VOL) Don't Know → SKIP TO Q20A/B
- 9 = (VOL) Refused → SKIP TO Q20A/B

Q19. [NY & PA] [IF Q18 = more OR less frequently] Why do you model energy usage [INSERT Q18 answer] compared to five years ago?

- 1= Record Response: \_\_\_\_\_
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q20A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF (Q8 > 1 or Q8a=2)]

**(For first item, read:)** How often, if at all, in the past two years have you recommended products that exceeded energy code in multifamily new construction or gut rehab projects for...**(INSERT ITEM)**? Would you say... [READ ANSWER CHOICES FOR FIRST ITEM AND ONLY AS NEEDED FOR REMAINING ITEMS]

[PROGRAMMER'S NOTE: QUESTION STEM SHOWS UP IN PARENTHESES AFTER THE FIRST ITEM FOR READING IF NECESSARY]

**(For remaining items, read:)** How about for...**(INSERT ITEM)**?

a. Lighting	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
b. Heating	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
c. Cooling	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
d. Water heating	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
e. Insulation	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF

Q20B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF (Q8 > 1 or Q8a=2)]

**(For first item, read:)** How often, if at all, in the past two years were measures that exceeded energy code recommended in multifamily new construction projects for ...**(INSERT ITEM)**? Would you say... [READ ANSWER CHOICES FOR FIRST ITEM AND ONLY AS NEEDED FOR REMAINING ITEMS]

[PROGRAMMER'S NOTE: QUESTION STEM SHOWS UP IN PARENTHESES AFTER THE FIRST ITEM FOR READING IF NECESSARY]

**(For remaining items, read:)** How about for...**(INSERT ITEM)**?

a. Lighting	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
b. Heating	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
c. Cooling	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
d. Water heating	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF
e. Insulation	1_Never	2_Rarely	3_Sometimes	4_Often	5_Always	8_DK	9_REF

Q20B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF (Q20B a, b, c, d, OR e ≠ NEVER), ELSE SKIP TO Q24] How often did your firm make these recommendations versus another firm like the architect, engineer, energy consultant? [READ ANSWER CHOICES]

1\_Never  
2\_Rarely  
3\_Sometimes  
4\_Often  
5\_Always  
8 = (VOL) Don't Know  
9 = (VOL) Refused

Q21. [NY & PA] [IF Q20A OR Q20B a, b, c, d, OR e ≠ NEVER, ELSE SKIP TO Q24] To your knowledge, how often, if at all, were these recommendations accepted by the building owner? [READ ANSWER CHOICES]

1\_Never  
2\_Rarely  
3\_Sometimes  
4\_Often  
5\_Always  
8 = (VOL) Don't Know  
9 = (VOL) Refused

- Q22. [NY & PA] [IF (Q3 = 5+ years) AND (Q20A OR Q20B a, b, c, d, OR e ≠ NEVER), ELSE SKIP TO Q24] Compared to five years ago, did you make these recommendations...
- [READ CHOICES]
- 1\_More frequently  
 2\_About the same → SKIP to Q24  
 3\_Less frequently  
 8 = (VOL) Don't Know → SKIP to Q24  
 9 = (VOL) Refused → SKIP to Q24
- Q23. [NY & PA] [IF Q22 = more OR less frequently] Why is your firm providing above-energy code recommendations [INSERT Q22 answer] compared to five years ago?
- 1 = Record Response: \_\_\_\_\_  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused
- Q24. [NY & PA] [IF (Q16A OR 16B ≠ NEVER OR DK OR REF) OR (IF Q20A OR Q20B a, b, c, d, OR e ≠ NEVER), ELSE SKIP TO Q25] Overall, about what percentage of your new construction and gut rehab multifamily projects exceeded energy codes by 15 percent or more?
- (RANGE=0 to 100; 998=Don't Know; 999=Refused)
- \_\_\_\_\_ percentage of projects exceeding 15% energy savings or more

## Retrofit

- Q25. [NY & PA] [If Q7b = YES, ELSE SKIP TO Q53] Next, I have similar questions about multifamily existing building retrofit or upgrade projects that your firm was involved in during the past two years in New York State/Pennsylvania.
- How many multifamily projects in the past two years were retrofits or upgrades to existing buildings?
- (RANGE= 0 to 1000; 9998=DK, 9999=REF)
- \_ \_ retrofit projects
- [IF Q25=1, ASK Q26.] [IF Q25 = 0, SKIP TO Q53] [IF Q25 > 1 SKIP TO Q37]  
 [IF Q25=DK or REF, ASK Q25a.]
- Q25a. [NY & PA] Would you say it is...(READ)?
- 1 = only one,  
 2 = more than one, or  
 3 = none?  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused
- [IF Q25a=1, ASK Q26. IF Q25a=2, SKIP TO Q37. IF Q25a=3, DK or REF, SKIP TO Q53.]
- Q26. [NY & PA] [IF Q25 = 1 or Q25a=1] Was this project pursuing a LEED certification?
- 1\_Yes  
 2\_No  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused

Q27A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q25 = 1 or Q25a=1] As part of this retrofit project, did your firm look for opportunities to reduce the amount of building energy use? [INTERVIEWER NOTE: If needed, probe for energy audits, product recommendations, or model energy usage]

1\_Yes

2\_No → SKIP TO Q53

8 = (VOL) Don't Know

9 = (VOL) Refused → SKIP TO Q53

Q27B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q25 = 1 or Q25a=1] As part of this retrofit project, were opportunities to reduce the amount of building energy use identified? [Probe for energy audits, product recommendations, or model energy usage]

1\_Yes

2\_No → SKIP TO Q53

8 = (VOL) Don't Know

9 = (VOL) Refused → SKIP TO Q53

Q28A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF (Q25 = 1 or Q25a=1) AND Q27A = YES OR DK] Did your firm conduct a building energy audit to identify opportunities to save energy?

1\_Yes

2\_No → SKIP TO Q53

8 = (VOL) Don't Know → SKIP TO Q53

9 = (VOL) Refused → SKIP TO Q53

Q28B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF (Q25 = 1 or Q25a=1) AND Q27B = YES OR DK] Was a building energy audit conducted to identify opportunities to save energy?

1\_Yes

2\_No → SKIP TO Q53

8 = (VOL) Don't Know → SKIP TO Q53

9 = (VOL) Refused → SKIP TO Q53

Q28B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q28B = YES] Did your firm or someone else conduct the energy audit?

[PROBE: architect, engineer, energy consultant]

1\_Respondent's firm

2\_Someone else [please specify:] \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

- Q29. [NY & PA] [IF (Q25 = 1 or Q25a=1) AND (Q28A OR Q28B = YES)] Was the energy audit comprehensive, meaning it addressed all energy using equipment and savings opportunities, regardless of fuel?
- 1\_Yes  
2\_No  
DK  
8 = (VOL) Don't Know  
9 = (VOL) Refused
- Q30. [NY & PA] [If (Q25 = 1 or Q25a=1) AND (Q28A OR Q28B = YES)] [If Q29 = YES, READ: Just to clarify...] Did the energy audit address?
- |                      |       |      |      |       |
|----------------------|-------|------|------|-------|
| a. Lighting          | 1_Yes | 2_No | 8_DK | 9_REF |
| b. Heating           | 1_Yes | 2_No | 8_DK | 9_REF |
| c. Cooling           | 1_Yes | 2_No | 8_DK | 9_REF |
| d. Water heating     | 1_Yes | 2_No | 8_DK | 9_REF |
| e. Insulation levels | 1_Yes | 2_No | 8_DK | 9_REF |
- Q31A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q30 a, b, c, d, OR e = YES, ELSE SKIP TO Q34A] Did your firm estimate the energy savings for (these measures / this measure)?
- 1 = Yes  
2 = No  
8 = (VOL) Don't Know  
9 = (VOL) Refused
- Q31B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q30 a, b, c, d, OR e = YES, ELSE SKIP TO Q34B] Were the energy savings for (these measures / this measure) estimated?
- 1 = Yes  
2 = No → SKIP TO Q32B  
8 = (VOL) Don't Know → SKIP TO Q32B  
9 = (VOL) Refused → SKIP TO Q32B
- Q31B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q31B = YES] Did your firm or someone else estimate these savings?
- [PROBE: architect, engineer, energy consultant]  
1\_Respondent's firm  
2\_Someone else [please specify:] \_\_\_\_\_  
8 = (VOL) Don't Know  
9 = (VOL) Refused
- Q32A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q30 a, b, d, OR e = YES, ELSE SKIP TO Q34A] Did your firm estimate the costs for the individual energy saving's measures?
- 1\_Yes  
2\_No  
8 = (VOL) Don't Know  
9 = (VOL) Refused



Q32B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q30 a, b, d, OR e = YES, ELSE SKIP TO Q34B] Were the costs for the individual energy saving's measures estimated?

1\_Yes

2\_No → SKIP TO Q33B

8 = (VOL) Don't Know → SKIP TO Q33B

9 = (VOL) Refused → SKIP TO Q33B

Q32B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q32B = YES] Did your firm or someone else estimate these costs?

[PROBE: architect, engineer, energy consultant]

1\_Respondent's firm

2\_Someone else [please specify:] \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q33A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q30 a, b, d, OR e = YES, ELSE SKIP TO Q34A] Did your firm model the building's energy savings from the identified measures?

1\_Yes

2\_No

8 = (VOL) Don't Know

9 = (VOL) Refused

Q33B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q30 a, b, d, OR e = YES, ELSE SKIP TO Q34B] Were the building's energy savings from the identified measures modeled?

1\_Yes

2\_No → SKIP TO 34B

8 = (VOL) Don't Know → SKIP TO 34B

9 = (VOL) Refused → SKIP TO 34B

Q33B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [If Q33B = YES] Did your firm or someone else develop the model?

[PROBE: architect, engineer, energy consultant]

1\_Respondent's firm

2\_Someone else [please specify:] \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q34A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q28A = YES, ELSE SKIP TO Q53] Did your firm provide the owner or manager a written report with the costs and savings from the energy saving measures?

1\_Yes

2\_No

8 = (VOL) Don't Know

9 = (VOL) Refused

Q34B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q28B = YES, ELSE SKIP TO

Q53] Was the owner or manager provided a written report with the costs and savings from the energy saving measures?

1\_Yes

2\_No

8 = (VOL) Don't Know

9 = (VOL) Refused

Q35. [NY & PA] [IF Q28A OR 28B = YES, ELSE SKIP TO Q53] [If Q34A OR Q34B = NO →

READ: Regardless of whether your firm provided a written report...] To your knowledge, did the building owner adopt the energy savings recommendations completely, partially, or not at all?

1\_Completely

2\_Partially

3\_Not at all

8 = (VOL) Don't Know

9 = (VOL) Refused

Q36. [NY & PA] [IF Q28A OR Q28B = YES] Overall, did this project exceed energy codes by 15 percent or more?

1\_Yes

2\_No

8 = (VOL) Don't Know

9 = (VOL) Refused

**[If (Q25 = 1 or Q25a=1) → SKIP TO Q53]**

Q37. [NY & PA] [If Q7b = YES AND (Q25 > 1 or Q25a=2)] In how many of these projects were you pursuing a LEED certification?

(RANGE= 0 to 1000; 9998=DK, 9999=REF)

\_\_\_\_\_ LEED projects

Q38A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q25 > 1 or Q25a=2] As part of all of your multifamily existing building retrofit and upgrade projects, how often, if at all, did your firm look for opportunities to save energy? [Probe for energy audits, product recommendations, model of energy use] [READ ANSWER CHOICES]

1\_Never → SKIP to Q53

2\_Rarely

3\_Sometimes

4\_Often

5\_Always

8 = (VOL) Don't Know

9 = (VOL) Refused

Q38B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q25 > 1 or Q25a=2] As part of all of your multifamily retrofit projects, how often, if at all, were opportunities to save energy identified? [Probe for energy audits, product recommendations, model of energy use] [READ ANSWER CHOICES]

- 1\_Never → SKIP to Q53
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q39A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [Q38A ≠ NEVER] How often, if at all, did your firm conduct building energy audits to identify opportunities to save energy? [READ ANSWER CHOICES]

- 1\_Never → SKIP to Q52
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know → SKIP to Q52
- 9 = (VOL) Refused → SKIP to Q52

Q39B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [Q38B ≠ NEVER] How often, if at all, were building energy audits to identify opportunities to save energy conducted? [READ ANSWER CHOICES]

- 1\_Never → SKIP to Q52
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know → SKIP to Q52
- 9 = (VOL) Refused → SKIP to Q52

Q39B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q39B ≠ NEVER OR DK OR REF] How often did your firm conduct the audits versus another firm like the architect, engineer, energy consultant? [READ ANSWER CHOICES]

- 1\_Never → SKIP to Q42
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

- Q40. [NY & PA] [IF Q39A OR Q39B ≠ NEVER OR DK OR REF] Compared to five years ago, did your firm conduct energy audits...
- [READ CHOICES]  
 1\_More frequently,  
 2\_About the same, or → SKIP to Q42  
 3\_Less frequently  
 8 = (VOL) Don't Know → SKIP to Q42  
 9 = (VOL) Refused → SKIP to Q42
- Q41. [NY & PA] [If Q40 = more OR less frequently] Why are you doing energy audits [INSERT Q40 answer] compared to five years ago?
- 1 = Record Response: \_\_\_\_\_  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused
- Q42. [NY & PA] [IF Q39A OR Q39B ≠ NEVER OR DK OR REF] How often, if at all, was the energy audit comprehensive, meaning it addressed all energy using equipment and savings opportunities, regardless of fuel? [READ ANSWER CHOICES]
- 1\_Never  
 2\_Rarely  
 3\_Sometimes  
 4\_Often  
 5\_Always  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused
- Q43. [NY & PA] [If Q42 ≠ NEVER → READ: Just to clarify...] How often, if at all, did the energy audit address...? [READ ANSWER CHOICES FOR FIRST ITEM AND ONLY AS NEEDED FOR REMAINING ITEMS]
- Would you say...(READ)?
- |                  |         |          |             |         |          |      |       |
|------------------|---------|----------|-------------|---------|----------|------|-------|
| a. Lighting      | 1_Never | 2_Rarely | 3_Sometimes | 4_Often | 5_Always | 8_DK | 9_REF |
| b. Heating       | 1_Never | 2_Rarely | 3_Sometimes | 4_Often | 5_Always | 8_DK | 9_REF |
| c. Cooling       | 1_Never | 2_Rarely | 3_Sometimes | 4_Often | 5_Always | 8_DK | 9_REF |
| d. Water heating | 1_Never | 2_Rarely | 3_Sometimes | 4_Often | 5_Always | 8_DK | 9_REF |
| e. Insulation    | 1_Never | 2_Rarely | 3_Sometimes | 4_Often | 5_Always | 8_DK | 9_REF |
- Q44A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [If Q43 a, b, c, d, OR e ≠ NEVER, ELSE SKIP TO Q52] How often, if at all, did you estimate the energy saving costs resulting from these measures? [READ ANSWER CHOICES]
- 1\_Never  
 2\_Rarely  
 3\_Sometimes  
 4\_Often  
 5\_Always  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused

Q44B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [If Q43 a, b, c, d, OR e ≠ NEVER, ELSE SKIP TO Q52] How often, if at all, were the energy saving costs resulting from these measures estimated? [READ ANSWER CHOICES]

- 1\_Never → SKIP TO Q45B
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q44B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [If Q44B ≠ NEVER] How often did your firm estimate these energy saving costs versus another firm like the architect, engineer, energy consultant? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q45A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [If Q43 a, b, c, d, OR e ≠ NEVER, ELSE SKIP TO Q52] How often, if at all, did you estimate the installed costs for these measures? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q45B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [If Q43 a, b, c, d, OR e ≠ NEVER, ELSE SKIP TO Q52] How often, if at all, were the installed costs for these measures estimated? [READ ANSWER CHOICES]

- 1\_Never → SKIP TO Q46B
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q45B.1. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q45B ≠ NEVER] How often did your firm make these estimations versus another firm like the architect, engineer, energy consultant? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q46A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF Q44A OR Q45A ≠ NEVER, ELSE SKIP TO Q48A] How often, if at all, did your firm provide the owner or manager a written report with the costs and savings for the various measures? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q46B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q44B OR Q45B ≠ NEVER, ELSE SKIP TO Q48B] How often, if at all, was the owner or manager provided a written report with the costs and savings for the various measures? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q47. [NY & PA] [If (Q44A OR Q45A ≠ NEVER) OR (Q44B OR Q45B ≠ NEVER), ELSE SKIP TO Q48A OR Q48B] [If Q46A OR Q46B = NEVER → READ: Regardless of whether you provided a written report...] To your knowledge, how often, if at all, were these measures accepted by the building owner? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q48A. [NY & PA] [IF RESPONDENT = ARCHITECT, ENGINEER, OR EE CONSULTANT] [IF (Q25 > 1 or Q25a=2) AND Q39A ≠ NEVER OR DK OR REF)] How often, if at all, did your firm provide modeled energy savings estimates during the past two years? [READ ANSWER CHOICES]

- 1\_Never → SKIP TO Q52
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q48B. [NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF (Q25 > 1 or Q25a=2) AND Q39B ≠ NEVER OR DK OR REF)] How often, if at all, were modeled energy savings estimates provided in multifamily projects during the past two years? [READ ANSWER CHOICES]

- 1\_Never → SKIP TO Q52
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q48B.1.[NY & PA] [IF RESPONDENT = CONTRACTOR/BUILDER] [IF Q48B ≠ NEVER] How often did your firm provide these models versus another firm like the architect, engineer, energy consultant? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q49. [NY & PA] [IF Q48A OR Q48B ≠ NEVER] To your knowledge, how often, if at all, were the model's recommendations adopted by the owner? [READ ANSWER CHOICES]

- 1\_Never
- 2\_Rarely
- 3\_Sometimes
- 4\_Often
- 5\_Always
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

- Q50. [NY & PA] [IF (Q3 = 5+ years) AND (Q48A OR Q48B ≠ NEVER), ELSE SKIP to Q52]  
 Compared to five years ago, do you provide modeled energy savings estimates...  
 [READ CHOICES]  
 1\_More frequently  
 2\_About the same → SKIP to Q52  
 3\_Less frequently  
 8 = (VOL) Don't Know → SKIP to Q52  
 9 = (VOL) Refused → SKIP to Q52
- Q51. [NY & PA] [If Q50 = more OR less] Why do you provide modeled energy savings estimates  
 [INSERT Q50 answer] compared to five years ago?  
 1 = Record Response: \_\_\_\_\_  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused
- Q52. [NY & PA] [IF Q38A OR Q38B ≠ NEVER] Overall, what percentage of your retrofit or upgrade multifamily projects exceeded energy codes by 15 percent or more?  
 (RANGE=0 to 100; 998=Don't Know; 999=Refused)  
 \_\_\_\_\_ percentage of projects exceeding 15% energy savings

## Program Related

Next I'd like to ask you about programs that serve the multifamily building sector as well as your views and practices regarding energy efficiency in the multifamily sector.

- Q53. Before now, were you aware of each of the following multifamily building incentive programs?
- |   |       |      |      |       |
|---|-------|------|------|-------|
| a. [NY & PA] Utility incentive programs                 | 1_Yes | 2_No | 8_DK | 9_REF |
| b. [PA Only] Pennsylvania government incentive programs | 1_Yes | 2_No | 8_DK | 9_REF |
| b. [NY Only] NYSERDA Home Performance with ENERGY STAR  | 1_Yes | 2_No | 8_DK | 9_REF |
| c. [NY Only] NYSERDA New Construction Program           | 1_Yes | 2_No | 8_DK | 9_REF |
| d. [NY Only] NYSERDA Multifamily Performance Program    | 1_Yes | 2_No | 8_DK | 9_REF |
- Q54. [NY Only] [IF Q53d = NO or DK or REF, ELSE SKIP TO Q56] [INTRO: NYSERDA's Multifamily Performance Program, or MPP, provides support and incentives for making multifamily buildings with five or more units in New York more energy efficient. Partners are consultants that contract with MPP participants, like building owners and developers, to aid in this process. For example, partners develop an Energy Reduction Plan for existing or new buildings, which includes estimated or modeled savings taking into account interactive system effects. They also provide cost estimate for recommended measures and shepherd participants through program processes including the application process and periodic inspections.] On a scale of 0 to 10 where '0' means not at all interested and '10' means extremely interested, how interested is your firm in becoming an MPP Partner?

Not at all interested										Extremely interested	
0	1	2	3	4	5	6	7	8	9	10	



Q55. [NY Only] [IF Q53d = NO or DK or REF] Why do you say that?

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

**[IF Q53d = NO or DK or REF, SKIP TO Q69]**

Q56. [NY Only] [If Q53d = YES] How did you learn about NYSERDA's Multifamily Performance Program?

[PROBE IF NEEDED: the NYSERDA website, a NYSERDA representative, a utility website, another building professional or contractor, a vendor or retailer, a professional organization, a client, or a newsletter. ]

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q57. [NY Only] [If Q53d = YES] In the past two years, has your firm been involved in any multifamily projects supported by NYSERDA's Multifamily Performance Program?

1\_Yes → SKIP to Q60

2\_No

8 = (VOL) Don't Know

9 = (VOL) Refused

Q58. [NY Only] [IF Q57 = NO or DK or REF, ELSE SKIP TO Q60] [INTRO: Partners are consultants that contract with MPP participants, like building owners and developers, to aid in this process. For example, partners develop an Energy Reduction Plan for existing or new buildings, which includes estimated or modeled savings taking into account interactive system effects. They also provide cost estimates for recommended measures and shepherd participants through program processes including the application process and periodic inspections.] On a scale of 0 to 10 where '0' means not at all interested and '10' means extremely interested, how interested is your firm in becoming an MPP Partner?

Not at all interested										Extremely interested	
0	1	2	3	4	5	6	7	8	9	10	

[IF (Q58=DK or REF), SKIP TO Q69.]

Q59. [NY Only] [IF (Q57 = NO or DK or REF) AND (Q58=0 through 10)] Why do you say that?

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

**[IF Q57 = NO or DK or REF, SKIP to Q69]**

Q60. [NY Only] [If Q57 = YES] How many of each of the following types of multifamily projects your firm has been involved in during the past two years were supported by MPP?

(RANGE= 0 to 1000; 9998=DK, 9999=REF)

a. [If Q8 > 0] New construction or gut rehabs \_\_\_\_\_

b. [If Q25 > 0] Existing building retrofits or upgrades \_\_\_\_\_

**[IF Q60a + Q60b = 0, SKIP TO Q63] [IF Q60a + Q60b > 1, SKIP TO Q61B]**

**[IF BOTH Q60a and Q60b = DK or REF, SKIP TO Q63.]**

Q61A. [NY Only] [IF Q60a + Q60b = 1] In your MPP-supported project, was the NYSERDA Partner's contributions to your planning and decision-making valuable or not?

1\_Yes, valuable

2\_No, not valuable

8 = (VOL) Don't Know → SKIP to Q63

9 = (VOL) Refused → SKIP to Q63

Q61B. [NY Only] [IF Q60a + Q60b > 1] In your MPP-supported projects, on average, were the NYSERDA Partners' contributions to your planning and decision-making valuable or not?

1\_Yes, valuable

2\_No, not valuable

8 = (VOL) Don't Know → SKIP to Q63

9 = (VOL) Refused → SKIP to Q63

Q62. [NY Only] [IF Q61A OR Q61B = 1 or 2] Could you please explain why?

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q63. [NY Only] [IF Q61A OR Q61B = DK or REF → READ INTRO: Partners are consultants that contract with MPP participants, like building owners and developers, to aid in this process. For example, partners develop an Energy Reduction Plan for existing or new buildings, which includes estimated or modeled savings taking into account interactive system effects. They also provide cost estimates for recommended measures and shepherd participants through program processes including the application process and periodic inspections.] On a scale of 0 to 10 where '0' means no consideration at all and '10' means lots of consideration, how much consideration has your firm given to becoming an MPP Partner?

No consider- ation										Lots of consider- ation	
0	1	2	3	4	5	6	7	8	9	10	

Q64. [NY Only] Why do you say that?

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

## Impact Evaluation

Q65. [NY Only] [IF Q57 = YES] In what ways, if any, has your involvement with NYSERDA's MPP program changed what your business does in the multifamily sector?

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

- Q66. [NY Only] [IF Q57 = YES] On a scale of 0 to 10, where 0 is not at all influential and 10 is extremely influential, how influential has MPP been in your promotion of energy efficient building design in multifamily building projects? [READ ANSWER CHOICES]

Not at all influential										Extremely influential
0	1	2	3	4	5	6	7	8	9	10

- Q67. [NY Only] [IF Q57 = YES] On a scale of 0 to 10, where 0 is not at all influential and 10 is extremely influential, how influential has MPP been in your promotion of energy efficient measures in multifamily building projects? [READ ANSWER CHOICES]

Not at all influential										Extremely influential
0	1	2	3	4	5	6	7	8	9	10

- Q68. [NY Only] [IF Q57 = YES] Has your involvement with NYSERDA's MPP Program increased, decreased or had no effect on the degree to which you have promoted the value of energy efficiency to each of the following types of clients?

a. Multifamily building clients	1_Increased	2_No Change	3_Decreased	8_DK	9_REF
b. Commercial clients	1_Increased	2_No Change	3_Decreased	8_DK	9_REF
c. Residential	1_Increased	2_No Change	3_Decreased	8_DK	9_REF

- Q69. [NY & PA] In the past two years, have you seen an increased effort by multifamily developers, owners, or managers to make their buildings more energy efficient?

1\_Yes  
 2\_No → SKIP to Q77  
 8 = (VOL) Don't Know → SKIP to Q77  
 9 = (VOL) Refused → SKIP to Q77

- Q70. NY & PA] [IF Q69 = YES] What do you think has caused this increased interest?

[PROBE IF NEEDED: recession over/economy recovering, increased shortage of rental properties, demand by potential renters, increased environmental attitudes, code requirements, benchmarking requirements, MPP or Partners, LEED, or ENERGY STAR]  
 1 = Record Response: \_\_\_\_\_  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused

- Q71. [NY & PA] [IF Q69 = YES] Has this increased the amount of multifamily energy efficiency work you do in New York State?

1\_Yes  
 2\_No → SKIP TO Q74  
 8 = (VOL) Don't Know → SKIP TO Q74  
 9 = (VOL) Refused → SKIP TO Q74

- Q72. [NY & PA] [IF Q71 = YES] In the past two years have you added any new services or technologies to meet the increased interest?
- [INTERVIEWER NOTE: IF NEEDED, 'INTEREST' IN THIS QUESTION IS REFERRING TO INTEREST IN ENERGY EFFICIENCY IN MULTIFAMILY BUILDINGS]
- 1\_Yes  
 2\_No → SKIP TO Q74  
 8 = (VOL) Don't Know → SKIP TO Q74  
 9 = (VOL) Refused → SKIP TO Q74
- Q73. [NY & PA] [IF Q72 = YES] What new practices or new technologies have you added?
- 1 = Record response \_\_\_\_\_  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused
- Q74. [NY Only] [If Q57 = YES, ELSE SKIP TO Q77] In the past two years, have you completed any multifamily projects in New York State that did not include government, NYSERDA, or utility program incentives for the efficiency design or equipment installed?
- 1\_Yes  
 2\_No → SKIP TO Q77  
 8 = (VOL) Don't Know → SKIP TO Q77  
 9 = (VOL) Refused → SKIP TO Q77
- Q75. [NY Only] [If Q74 = YES, ELSE SKIP TO Q77] Can you or someone else in your firm identify these non-incentivized projects and specific efficiency design elements and equipment installed?
- 1\_Yes  
 2\_No → SKIP TO Q77  
 8 = (VOL) Don't Know → SKIP TO Q77  
 9 = (VOL) Refused → SKIP TO Q77
- Q76. [NY Only] [If Q74=YES and Q75 = YES] Rather than take time now, is there someone that one of our engineers can talk to or exchange emails with, to get detailed energy savings estimates for these projects?
- 1\_Yes → [Record name, office #, email address]  
 2\_No  
 8 = (VOL) Don't Know  
 9 = (VOL) Refused
- Q77. [NY & PA] Please answer the next question on a scale of 0 to 10 where '0' means not at all valuable and 10 means extremely valuable. How valuable would it be to have a source of energy efficiency information in New York that is not connected to the sales of energy efficiency measures?

Not at all valuable										Extremely valuable	
0	1	2	3	4	5	6	7	8	9	10	

## Firmographics

Finally, I have few general questions about your firm to ensure that we have heard from the many different types of firms in the state.

Q78. [NY & PA] Does your firm conduct any marketing activities?

1\_Yes

2\_No → SKIP to Q82

8 = (VOL) Don't Know → SKIP to Q82

9 = (VOL) Refused → SKIP to Q82

Q79. [NY & PA] [IF Q78 = YES] What qualities of your firm do you mention or emphasize in your marketing materials?

[PROBE IF NEEDED: Innovative/Creative, Professional/Experienced, Personal/Local, Trustworthy, Solution-driven, Affordable/Cost-effective, Quality/Value, Multi-disciplinary, Award-winning, Green/sustainable/environmental, Energy efficient, or LEED certified)

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q80. [NY & PA] [IF Q3 = 5+ years AND Q78 = YES, ELSE SKIP TO Q82] Have your marketing messages changed over the past five years?

1\_Yes

2\_No → SKIP to Q82

8 = (VOL) Don't Know → SKIP to Q82

9 = (VOL) Refused → SKIP to Q82

Q81. [NY & PA] [IF Q80 = YES] What changes have you made in your marketing messages?

1 = Record Response: \_\_\_\_\_

8 = (VOL) Don't Know

9 = (VOL) Refused

Q82. [NY & PA] How many employees does your firm have at this location?

(RANGE= 1 to 100,000; 999998=DK, 999999=REF)

\_\_\_\_\_ employees

Q83. [NY & PA] How many staffed offices does your firm have...?

(RANGE= 0 to 100,000; 999998=DK, 999999=REF)

a. In New York State/Pennsylvania excluding this location \_\_\_\_\_ offices in NYS  
b. Outside New York State/Pennsylvania \_\_\_\_\_ offices outside NYS

Q84. [NY & PA] How many employees does your firm have...?

(RANGE= 0 to 100,000; 999998=DK, 999999=REF)

a. [IF Q83a > 0] In New York/Pennsylvania excluding this location \_\_\_\_\_ employees  
b. [IF Q83b > 0] Outside New York State/Pennsylvania \_\_\_\_\_ employees

Q85. [NY & PA] [IF Q3 = 5+ years] Compared to five years ago, has the percentage of your New York State/Pennsylvania employees engaged in multifamily energy efficiency increased, decreased, or stayed about the same?

- 1\_Increased
- 2\_Stayed about the same
- 3\_Decreased
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Q86. [NY & PA] To conclude, do you have additional comments, questions, observations?

[INTERVIEWER NOTE: IF YOU ARE UNABLE TO ANSWER QUESTIONS THE RESPONDENT MIGHT HAVE, REFER THE RESPONDENT TO TODD FRENCH, THE PROJECT MANAGER AT NYSERDA, AT 1-866-NYSERDA (697-7372), EXT. 3212.]

- 1 = Record Response: \_\_\_\_\_
- 2 = No Comment
- 8 = (VOL) Don't Know
- 9 = (VOL) Refused

Those are all of the questions that I have for you. Thank you for taking the time to participate. Have a great morning/afternoon.

## Participant In-Depth Interview

Table A-1 provides an overview of the data collection strategy for interviewing upstate and downstate program participants. The PE/MCA Team will conduct two types of interviews – one longer and more in-depth; the other shorter and semi-structured. We will attempt to complete 20 in-depth interviews (administering all questions below) with about 20 contacts. These interviews may run as long as 90 minutes. We will administer a 30-minute version to the remaining sample (subset of questions identified as dark orange below). Our goal is to complete interviews with a sufficient number of respondents using both approaches to achieve 90/10 precision for the questions addressing MCA topics.

**Table A-1. Overview of Data Collection Activity**

Contacts and Approach	This Instrument
Instrument Type	In-depth interview
Estimated Time to Complete	<ul style="list-style-type: none"> <li>▪ Long form: TBD – goal is 1 hour, MPP_V4 contacts may run a bit longer</li> <li>▪ Short form: TBD – goal is in the 30 minute range</li> </ul>
Population	Participants in NYSERDA's Multifamily Performance Program (MPP) from the program's CRIS database limited to projects that were new, or completed program Stage 2, on or after January 1, 2012.
Sampling Strata	<ul style="list-style-type: none"> <li>▪ Upstate: 47%</li> <li>▪ Downstate: 53%</li> </ul>
Population Size	~344
Call List	We anticipate needing to call a census of participants to meet our completion goal
Completion Goal	<ul style="list-style-type: none"> <li>▪ Upstate: 53</li> <li>▪ Downstate: 60</li> </ul>
Source of Call List	NYSERDA CRIS Database
Contact Sought	Owner is preferred; if not knowledgeable, developer; both contacts from CRIS participants database

## Participant Research Objectives

Survey questions address the evaluation's research objectives for participants; Table A-2 illustrates the association between these objectives and survey questions. Objectives in **red font** relate to market effects [ME]. All other questions relating to the topic are listed in Column 3. The numbering of the research objectives (column 2) and market effects (column 1) relates to internal team tracking documents.

**Table A-2. Research Objectives and Associated Questions. Specific Market Effects are Highlighted in Red**

Research Objectives	ME Survey Questions	Other Questions
Assess participant satisfaction with program features and processes (e.g.: technical services (TS), ERPs, partners, program benefits); TS influence on project decisions and selection of measures	Q37	Q35-Q36, Q70, Q74
Identify challenges encountered throughout program process		Q23-Q24, Q25-Q26a, Q34, Q41, Q48, Q55-Q56, Q57-Q59, Q71-72,
Document challenges and opportunities with multi-fuels approach: electricity, natural gas, and fuel oil		Q11-Q15
Document the role that Partners play in existing multifamily building projects, assess role Partner plays in efficiency choices	Q39, Q40, Q46, Q47	Q52-Q55
Document participant processes for accessing financing options; usefulness and value of different financing options; satisfaction w/ financing packaging services and effects of MPP/Partner on ability to package sufficient funding to implement full project; Number of participants taking out loans for EE upgrades (market rate and affordable-housing).	Q29, Q31, Q32, Q33	Q28, Q30
Assess communication (both patterns and quality of) between participants, program staff, and partners		Q27, Q42
Assess sources of participating building owner/developer's awareness and knowledge of EE and of program services; prior to MPP, how did participants get EE advice? Change in the number of building owners having knowledge of energy efficiency and associated technologies (self-reported pre-knowledge).	Q3, Q4, Q5	Q1, Q2, BL1-3, Q6-Q10, Q17-Q18,
Assess influence of MPP services on new construction projects and MPP Partner influence on design process	Q43, Q44	
Assess value of program to participants, including effect on attracting tenants; ME's related to 4c include: Multifamily building owners recognize the: a) relationship between EE and cash flow improvements, as well as environmental and health benefits, b) benefits of ENERGY STAR label, c) benefits of properly trained building and system technicians; and d) Multifamily owners find it profitable to use knowledgeable building and system technicians; e) Multifamily property participating owners seek training for, or seek trained, building and system technicians for other properties.	Q 19, Q20, Q21 Q50, Q60,	Q73
Assess barriers to participation among building owners/developers.		Q22, Q26b-c, Q27a, Q38, Q45
Potential spillover		Q61-Q69

## Notes to Interviewer

Note to NYSERDA: The following are informal descriptions of program processes, solely to inform the interviewer. They are not intended to be definitive descriptions of the processes.

Application: the application primarily registers the intent of a prospect to join the program.



Next step is scoping meeting: on-site visit (by phone if new construction) with partner and NYSERDA staff. Scoping explores whether the project is likely to meet program savings requirements, and is used for making decisions prior to developing the actual implementation plan outlined in ERP development. If all agree that the project is likely to meet savings requirements, the partner and prospective participant discuss options and partner develops the ERP.

The ERP: the implementation plan approved by NYSERDA to start work.

Fast track (in MPP\_v5 only): a simplified process for multifamily buildings under 50 units, intended to offer lower partner/scoping-ERP related costs than standard path (This option does not necessarily take a shorter time than the Standard path)

Fast track project incentives: 5-49 units get one base incentive payment at 100% completion; projects under 49 units get three base incentives: b, d, e. Projects over 49 get incentives at d & e.

Any project targeted for savings over 20% (program requires 15% minimum): actual performance after one year is assessed, savings confirmed, and the owner qualifies for a performance incentive. Partner conducts this verification, called “post-construction benchmarking.”

Program measurement and verification (M&V): owner must sign a NYSERDA form called a “data release authorization form – draft.” NYSERDA contracts with TRC and Taitem to do site visits for up to 36 months post completion – see panel slides. This is the M&V, if it happens; not all projects are M&V’ed. Owners may not know this term (M&V).

## Intro [ALL]

II. Hello, may I speak to [name from call list]?

Hi, my name is [NAME], and I’m calling on behalf of NYSERDA. As part of NYSERDA’s continual improvement activities to enhance its multifamily incentive program, we are talking with firms like yours to hear about your experience with the Multifamily Performance Program. Could we schedule a time for me to call you for an interview in the next couple of weeks that would best fit your schedule?

If needed:

- Explain that Research Into Action is part of the team that NYSERDA selected to conduct an evaluation of its multifamily incentive program - NYSERDA gave us their name because he/she has received services from NYSERDA’s Multifamily Performance Program
- Not selling anything
- Responses confidential
- For verification, contact Todd French at NYSERDA (518) 862-1090 X 3212

## Screening [ALL]

Are you the person who was involved with the Multifamily Performance Program, or MPP as it is commonly called, and the project mentioned above? [IF NOT, ASK WHO IS MORE FAMILIAR AND OBTAIN NEW CONTACT INFORMATION]

[INTERVIEW NOTE: ENSURE THEY ARE THE BUILDING OWNER, DEVELOPER, OR MANAGER AND NOT THE PARTNER OR ANOTHER CONTRACTOR.]

[WHEN CORRECT RESPONDENT IS ON THE PHONE]

I anticipate we will need about [an hour or half an hour (depending on version)] to complete the survey. The information you provide will be kept confidential to the extent permitted by law. Nothing you say will be identified with you in our reports. I'll be audio recording this interview to ensure the accuracy of my notes. The recording will only be used by Research Into Action staff and will not be provided to NYSERDA.

Do you have any questions before we get started?

## Version Selection and Refusal Scenario

**Initial refusal:** If the respondent attempts to opt out of the survey, say:

"By receiving a rebate through this program, your organization agreed to participate in this follow-up study on your experiences with this program. I'd be happy to schedule an interview for a future date. Is there a day/time in the next two weeks that would work best for you?"

**Long form refusal:** If the participant was selected for the long version, but is not willing or able to spend 60-90 minutes with you, say:

R-1. "I understand that you have limited time. Your feedback is valuable to us as program evaluators. Could you give me 30 minutes of your time for a few key questions?  
[SCHEDULE CALL BACK OR CONTINUE WITH SHORT VERSION]

**Short form refusal – Soft refusal:** If the participant is unwilling to complete the short version of the guide, and is not disgruntled in any way, say:

R-2. "I understand that you have limited time. Could you briefly tell me how satisfied you are with the MPP program overall and describe any changes you'd like to see made in the future?"  
[COLLECT THE INFORMATION, THANK THEM, AND TERMINATE.]

**Hard refusal:** If the participant is unwilling to complete any version of the guide, and is clearly disgruntled, say:

- R-3. “I’m sorry to hear that things haven’t worked out. It is very helpful for us as evaluators to understand what’s gone wrong. Could you briefly tell me about the situation and your suggestions for program changes that could help to fix that situation?”  
[COLLECT THE INFORMATION, THANK THEM, AND TERMINATE.]

## Firm Descriptors & Baseline Knowledge Before MPP

Today we are going to talk about your latest MPP project that has at least had its application accepted. First, I’d like to get a bit of background on your role in the firm and whether your firm took any energy efficiency actions before getting involved in NYSERDA’s MPP.

Q0.1: What is your name?

[IF COMPANY IS NOT ON CALL LIST, ENTER THE FOLLOWING:]

Q0.2 Name of respondent’s company

Q0.3 Phone number

Q1. Can you please tell me your title and how long you have been in that role?

Q1.1 Is this the first time your firm has worked with MPP on a multifamily project?  
Yes [Y], No [N], dk [DK]

Q1.2 [IF NO]: About what year was your first MPP project?

Q1.3 Are you aware of the Building Performance Institute’s Multifamily Building Analyst Certification?  
Yes [Y], No [N]

Q2. Do you have multifamily properties in New York State, other than MPP project properties? Yes [Y], No [N], dk [DK]  
[INTERVIEWER NOTE: EXCLUDING ANY CURRENT OR PAST MPP PROJECTS]  
[IF NO, SKIP TO Q6]

Q3. Before your involvement with MPP, did you ever seek advice on different energy efficiency options for your properties?  
Yes [Y], No [N], dk [DK] [ME]  
[IF YES]

a. Where did you look, or whom did you talk to?

Q4. Before your involvement with MPP, had you engaged in any of the following activities for any of your New York State multifamily properties? How about... [ME]

- a. Commissioning of a new building to ensure optimal energy use performance  
Yes [Y], No [N], dk [DK]
  - b. Retrocommissioning to ensure optimal energy use performance  
Yes [Y], No [N], dk [DK]
  - c. Developed a plan to reduce energy use  
Yes [Y], No [N], dk [DK]
  - d. Had an energy assessment or audit to identify opportunities to reduce energy use  
Yes [Y], No [N], dk [DK]
  - e. Performed whole building energy modeling  
Yes [Y], No [N], dk [DK]
  - f. Benchmarked your energy consumption  
Yes [Y], No [N], dk [DK]
  - g. Pursued LEED certification [IF NEEDED: LEED stands for “Leadership in Energy & Environmental Design – a green building certification program]  
Yes [Y], No [N], dk [DK]
  - h. Upgraded equipment or aspects of the building for energy efficiency  
Yes [Y], No [N], dk [DK]
- Q5. Please use a scale from 0 to 10, where 0 means “not at all knowledgeable” and 10 means “extremely knowledgeable,” rate the level of knowledge you had about how to reduce energy use in all areas of your building(s), before your involvement with MPP.” [ENTER 0-10 OR DK] [ME]  
[IF ANY Q4=YES, ASK BL1 – BL3; Baseline Questions; ELSE SKIP TO Q6]  
[PROGRAMMER NOTE: Preserve question numbering convention of “BL” in the following section.]
- BL1. [BEFORE MPP] In retrofitting or designing these buildings, did you incorporate efficiency equipment based on a comprehensive energy assessment, one that takes into account how building systems work together?  
Yes [Y], No [N], dk [DK]
- a. [IF YES] Was this assessment done by internal staff or someone outside of the company?  
Internal staff [IS],  
Outside [O] dk [DK], Other [O]  
[IF [IS] “INTERNAL” SKIP TO Q6  
[IF [O] “OUTSIDE” CONTINUE]

- BL2. [BEFORE MPP] Did the assessment process include an energy efficiency plan or report that recommended specific measures to install to increase EE? Yes [Y], No [N], dk [DK], Other [O]  
[IF YES]
- a. For each measure did the plan include...
    - i. How much each would cost to install?  
Yes [Y], No [N], dk [DK], Other [O]
    - ii. How much energy each would save?  
Yes [Y], No [N], dk [DK], Other [O]
- BL3. For the measures that you did install, do you know the percentage reduction in your overall energy bill that the installed measures will save?  
Yes [Y], No [N], [IF YES, ENTER AMOUNT]

### Awareness, Reasons for Participation [ASK ALL]

- Q6. How or from whom did you learn about MPP?
- 
- Q6.1 Okay, now we would like to identify a specific MPP project property to talk about today. Thinking about the MPP projects for which your application was submitted and accepted in 2012 or later, how many of those projects were terminated before the project was totally completed? By terminated, we mean projects that you canceled their participation in the program before receiving any or all of the MPP incentives. All [A], Some [S], None [N], DK [DK]
- Q7. [INTERVIEWER NOTE: IF Q6=Some, SAY: "Okay, we will talk about terminated projects later. Now I would like to know about projects that were not prematurely terminated. So..."] Thinking about the MPP projects for which your application was submitted and accepted in 2012 or later, what is the property name of your most recent MPP project? This interview is about your experiences with MPP at this particular property.
- Q7.1 And what is the street address?
- Q7.2 And the city?
- Q7.3 Is this a new construction project, or an existing building?
- Q8. How would you describe your firm's role in this property at [ADDRESS]? Would you say you are the Sole Owner [SO], part of a group of Cooperative Owners [CO], the Property Manager [PM], the Developer [D], Architect [A], Engineer [E], several of these, or something else? [CHECK ALL THAT APPLY]

- Q9. [IF EXISTING, AND CONTACT NOT A [PM]] Does a property management firm manage this property?
- a. Yes [Y], No [N]
  - b. [IF YES] What role, if any, does the property management firm have in the decision-making process regarding equipment upgrades, building upgrades, or construction projects

- Q10. Are the units leased/ will the units be leased at full market rates [MR], at subsidized low income rates [LI], or a mixture [B, for both]? [INTERVIEWER NOTE: Code any “affordable rates” responses as “LI”; If they say the units will be sold as condominiums, adjust language accordingly]
- a. [IF BOTH] About what proportion of the units are (will be) leased at full market rates?

Q11. [DELETED]

Q12. [DELETED]

Q13. [DELETED]

- a. [DELETED]
  - i. [DELETED]

Q14. [DELETED]

- a. [DELETED]

Q15. [DELETED]

- a. [DELETED]

Q16. [DELETED]

[IF EXISTING BUILDING; ELSE SKIP TO Q18]

- Q17. Prior to learning about MPP, were you considering upgrading this facility?  
Yes [Y], No [N], dk [DK]
- a. [IF YES] And at that time, how strongly were you inclined to increase this facility’s energy efficiency? Would you say “not very” [NV], “somewhat,” [S] or “quite strongly” [QS]?
    - i. [IF S or QS] What efficiency measures or equipment were you considering?

[IF NEW CONSTRUCTION; ELSE SKIP TO Q19]

Q18. Prior to learning about MPP, how strongly were you inclined to construct a facility more energy efficient than energy codes? Would you say “not very” [NV], “somewhat,” [S] or “quite strongly” [QS]?

- a. [IF S OR QS] What design elements or measures were you considering?

[ASK ALL]

Q19. Using scale from 0 to 10, where 0 means “not at all important” and 10 means “extremely important,” how important was each of the following reasons for upgrading your multifamily property? If a topic doesn’t apply to you please let me know [ENTER 0-10, DK, or N/A] [RANDOMIZE] [ME]

- a. To improve cash flow by reducing energy costs
- b. To reduce energy costs for tenants
- c. To contribute to environmental or green objectives like lowering energy-related carbon emissions
- d. To contribute to potential tenant health benefits
- e. To increase the property’s market value by qualifying for the ENERGY STAR label
- f. To attain the ENERGY STAR label to attract tenants

Q20. Using the same 0 to 10 scale, please rate how important the following program features were for motivating you to do your project through MPP. If a topic doesn’t apply to you please let me know [ENTER 0-10, DK, or N/A] [RANDOMIZE] [ME]

- a. Partners work for you rather than MPP
- b. Partners are knowledgeable building and system technicians
- c. Partners do the required paperwork
- d. Partners identify efficiency options throughout the whole building
- e. Partners organize/handle most of the inspections
- f. Partners assist with packaging financing
- g. MPP incentives would help you meet internal ROI or payback requirement

Q21. Are there any other features or benefits of MPP that motivated you to participate? [IF YES] please describe: [ME]

[IF Q6.1=All, SKIP TO Q60.1]

Q22. [IF NEW CONSTRUCTION] Did you know that MPP offers Prescriptive and Performance paths for incentives? Yes [Y], No [N], dk [DK]

[IF YES]

- a. What path did you take?

[IF Q22a. is not DK]

- b. How did you come to select that path rather than other options? [IF NOT MENTIONED, ASK ABOUT ROLE THE PARTNER PLAYED IN PATH SELECTION]
  
- Q23. What company served as your performance partner on the project? [INTERVIEWER NOTE: If respondent cannot remember partner name, we can look at call list and read them the names of the different partners their company has worked with]
  - a. How did you two connect with each other for this work? [FODDER: NYSERDA list, NYSERDA recommendation, preexisting relationship, they came to us and proposed MPP, other]
  
- Q24. Did you encounter any challenges in negotiating a contract with your Partner?  
 Yes [Y], No [N], dk [DK]  
 [IF YES]
  - a. Please explain.
  - b. Do you have any suggestions on how MPP might make it easier for property owners to contract with Partners?
  
- Q25. [IF EXISTING BUILDING] Does this MPP property have less than 50 units?  
 Yes [Y], No [N], dk [DK]
  
- Q26. [IF Q25=YES] Are you aware of the Fast Track option for buildings with less than 50 units? This option has a less extensive assessment that uses an excel-based tool instead a full-scale building model.  
 Yes [Y], No [N]  
 [IF Q26=YES, ELSE SKIP TO Q28]
  - a. Is your project Fast Track? Yes [Y], No [N], dk [DK]
  - b. [IF Q26=YES] How did you come to choose the Fast Track path?
  - c. [IF Q26=YES] Would you have participated in MPP had Fast Track not been available?  
 Yes [Y], No [N], dk [DK]
  - d. Why do you say that?
  - e. [IF Q26=NO] What motivated you to follow the “standard” path instead of the Fast Track option?
  
- Q27. [MOVED to Q26]
  - a. [MOVED TO Q26e]

#### **Financing [ASK ALL]**

- Q28. Did you, or do you plan to, receive financing for this project?



- Yes [Y], No [N], dk [DK]  
 [IF YES; IF NO, SKIP TO INTRO ABOVE Q35]
- Q29. Was/Is additional financing required to cover the incremental costs of MPP recommended energy efficiency measures? [IF NEEDED: INCREMENTAL COSTS ARE COSTS OVER AND ABOVE WHAT WOULD BEEN INSTALLED WITHOUT THE PROGRAM] [ME]
- Q30. What public or public-private partnership sources of financing did you consider, if any?  
 [IF Green Jobs Green New York (GJGNY) NOT MENTIONED]
- a. Have you heard of Green Jobs – Green New York, a NYSERDA program?  
 Yes [Y], No [N], dk [DK]
  - b. [IF YES] Did you consider it as a source of financing?
    - i. [IF NOT] Why not?
    - ii. [IF YES] And did you receive financing from GJGNY?  
 Yes [Y], No [N], dk [DK]
      1. [IF YES GJGNY \$] If this financing was not available, would you have gone forward with the project?
      2. [IF NO GJGNY \$] Why not?
- Q31. Did working with MPP make it easier for you to secure sufficient funding for the project outlined in your Energy Reduction Plan?  
 Yes [Y], No [N], dk [DK] [ME]
- Q32. [IF Q31=YES] How did MPP make it easier to secure funding? [ME]
- a. [IF INCENTIVES ARE NOT MENTIONED, ASK] Did MPP incentives help you secure financing?  
 Yes [Y], No [N], dk [DK] [ME]
    - i. [IF YES] How did they help? [ME]
- Q33. Did your Partner provide information or otherwise help you to secure funding for this project?  
 [ME] Yes [Y], No [N], dk [DK]
- a. [IF YES] What role did they play? [ME]
- Q34. Do you see an opportunity to improve Partner or NYSERDA support for the financing process?  
 Yes [Y], No [N], dk [DK]
- a. [IF YES] Please explain.

### Building Assessment/ERP

[READ]: I'd like to hear about the Energy Reduction Planning activities that start with a facility assessment and result in a written Energy Reduction Plan or "E.R.P."

[IF EXISTING]

Q35. Has your Partner conducted the assessment of your facility for scoping out efficiency options?

Yes [Y], No [N], dk [DK]

Q36. [IF Q35=YES CONTINUE, ELSE SKIP TO Q60.1– SPILLOVER 2nd Q] To what extent did the building assessment or scoping process meet your expectations?

a. [IF NOT CLEAR] Why do you say that? [FODDER: Scheduling, time it took, delays or thoroughness, whole building reviewed, etc.]

Q37. Was the information provided on recommendations, costs, and savings potential sufficient to support your decision-making about which efficiency upgrades to implement? [PROBE TO UNDERSTAND ANY INSUFFICIENCY] [ME]

Q38. Did you decide to pursue all – or just some – of the recommended upgrades?

All [A], Some [S], dk [DK]

a. [IF SOME] Why is that? What kept you from doing all recommended upgrades?

Q38.1 Were there other energy efficiency improvements that you wanted to do that didn't qualify for an incentive?

Yes [Y], No [N], dk [DK]

[IF YES]

a. What is the reason they did not qualify?

b. What were they?

c. Did you install any of them? Which ones?

Q39. What role did your Partner play in the deliberation about recommendations and the final decision? [ME]

a. [IF PARTNER INVOLVED] Does any aspect of your Partner's involvement stand out as being most useful or persuasive? [ME]

i. [IF YES] What aspects? [ME]

Q40. On a scale of 0 to 10, where 0 is "no value at all" and 10 is "extremely valuable," how valuable would you say your Partner's efforts were to your decision making process? [Enter 0-10 or DK]

[ME]

a. Why do you say that?

Q41. Do you see any opportunity for streamlining, or otherwise improving MPP's or the Partner's role during the assessment and project-planning phase of an MPP project?

[IF NEW]

- Q42. How far along in the design process were you when you first started working with your MPP Partner? Would you say: early [E], midway [M], near the end of design process [E] at some other phase? [DESCRIBE]?
- Who are the members of your design team – and I mean type of firm involved? Who was at the table? [Architects [A], engineers [E], builder [B], owner [O], developer [D], Partner [P], other? [OE]]
  - And did all of these parties participate in the discussion of the energy efficiency opportunities? All [A], If not all, clarify who did: \_\_\_\_\_
- Q43. What contribution, if any, did your Partner bring to the design team? [ME]  
[FODDER: new information, a focus on EE, discussions of upgrades and measure options, alternative design options, savings potentials]
- Q44. Was the information sufficient to support your decision making about which efficiency elements to pursue? [PROBE TO UNDERSTAND ANY INSUFFICIENCY] [ME]
- Q45. Did you decide to pursue all – or just some – of the Partner’s recommendations?  
All [A], Some [S], None [N], dk [DK], N/A [NA]
- [IF SOME] Why is that? What kept you from doing all recommended measures?
- Q45.1 Were there other energy efficient products that you wanted to install that didn’t qualify for an incentive?  
Yes [Y], No [N], dk [DK]  
[IF YES]
- What is the reason they did not qualify?
  - What were they?
  - Did you install any of them? Which ones?
- Q46. What role did your Partner play in the deliberation about recommendations and the final design? [ME]
- [IF PARTNER INVOLVED] Does any aspect of your Partner’s involvement stand out as being most useful or persuasive? [ME]
    - [IF YES] What aspects?
- Q47. On a scale of 0 to 10, where 0 is “no value at all” and 10 is “very valuable,” how valuable would you say was your Partner’s efforts were to the design process? [ME] [ENTER 0-10 or DK]
- Why do you say that? \_\_\_\_\_
- Q48. Do you see any opportunity for streamlining, or otherwise improving MPP or the Partner’s roles, during this design phase of an MPP project?

Q49. [INTENTIONALLY LEFT BLANK]

[ALL - WITH THE EXCEPTION OF Q35=NO or DK; THOSE CASES INSTRUCTED ABOVE TO SKIP TO Q61 – SPILLOVER 2nd Q]

Q50. Because of your experience with, and the potential benefits of having projects scoped by a trained building specialist such as an MPP Partner, is it “highly likely,” “somewhat likely” or “not at all likely” that you will.... [ME]

- a. ...seek training for your building operators at any of your other multifamily properties? [“highly likely,” “somewhat likely,” or “not at all likely;” RECORD “NA” if owner doesn’t have building operator staff, doesn’t manage buildings, etc.]
- b. ...hire a trained building technician to recommend efficiency upgrades for your next multifamily property project? [“highly likely,” “somewhat likely,” or “not at all likely;” RECORD “NA” if owner doesn’t have any other multifamily properties]

Now let’s talk about construction or installation.

#### **Project Status and Inspections [By Partner]**

Q51. Is construction underway or completed? Underway [U], Completed [C], Not started [NS]

Q52. Which, if any, of the following construction or installation activities has your partner provided [/will your partner provide]?

- a. Construction management support, or the overall planning, coordination, and control of a project? (NOTE: Construction manager would handle all of the details of handling public safety, time management, decision-making, bids/payments, and human resources related to the project)  
[PROBE FOR DESCRIPTION] Yes [Y], No [N], DK [DK]
- b. Assisting in selecting the contractor?  
Yes [Y], No [N], DK [DK]
- c. Did, or will, your partner do any construction or installation work on the project?  
Yes [Y], No [N], dk [DK]
- d. [If Q52a, b, or c = YES] Can you briefly describe what that entails?

Q53. [DELETED]

Q54. [DELETED]

- a. [DELETED]

Q55. [IF Q51 = U OR C] Has your Partner conducted any [program-required] inspections of completed work to ensure it conforms to program rules and the ERP.  
Yes [Y], No [N], dk [DK]

[IF UNSURE, FIRST INSPECTION WOULD OCCUR AT ½ WAY POINT AND SECOND INSPECTION IS AFTER COMPLETION].

[IF NO INSPECTIONS YET, SKIP TO M&V PROCESS Questions -Q57]

Q56. [IF Q51 = U OR C] Was any of your staff involved in the inspection? Yes [Y], No [N], dk [DK]

[IF YES]

a. Was the inspection process reasonably easy to schedule ? Yes [Y], No [N], dk [DK]

i. [IF NO] Why not?

b. Did the inspection identify any issues to be addressed? Yes [Y], No [N], dk [DK]

i. [IF YES] Were they reasonably easy to comply with? Yes [Y], No [N], dk [DK]

ii. If no, what was problematic? [PROBES: delays, additional costs]

### **M&V by Program Staff [ALL]**

[Post construction M&V requirements; M&V performed by program staff, not Partner]

Q57. What, if any, concerns did you have about ...

a. ... providing utility bills to NYSERDA staff for 5 years?

No concerns [NC], Other, SPECIFY \_\_\_\_\_

b. ...allowing staff to do on-site visits for up to 3 years post-construction? No concerns

[NC], Other, SPECIFY \_\_\_\_\_

[IF Q51= COMPLETED, ELSE SKIP TO Q59]

Q58. Has program staff conducted a post-construction measurement on-site visit (or M&V site-visit) at your MPP project property?

Yes [Y], No [N], dk [DK]

[IF NO, DK → skip to Q59]

[IF YES...]

a. Was any of your staff involved in this post-project measurement, or M&V site visit by program staff?

Yes [Y], No [N], dk [DK]

[IF YES]

i. What issues, if any, did this inspection create for you or your staff? [Scheduling, delays, other]

Q59. Did your Partner or the ERP suggest that your project could qualify for Performance based bonus by exceeding 20% savings levels? Yes [Y], No [N], dk [DK]

[IF YES]

- a. Do you expect to, or have you received a post-performance bonus?  
Expect to [E], Have received [R], dk [DK]

[IF RECEIVED]

- i. Was the bonus amount what you expected? Yes [Y], No [N], dk [DK]  
ii. Why or why not?

**Spillover [ALL]**

[IF Q51 = COMPLETED, ELSE SKIP TO Q60.1]

Q60. After your initial MPP project was completed, have you gone on to do other, additional things to reduce the facility's energy use? Yes [Y], No [N], Plan to in future [P], dk [DK]

[ME] [INTERVIEWER NOTE: "Initial" project refers to the project that is the focus of the interview.]

[IF YES, CONTINUE]

[IF NO, SKIP TO Q60.1]

- a. What are these other steps? [INTERVIEWER NOTE – ADDITIONAL STEPS MUST BE ALREADY COMPLETED OR UNDERWAY; FUTURE PLANS DO NOT COUNT. IF FUTURE PLANS ARE MENTIONED, CHANGE Q60 TO “PLAN TO IN FUTURE” AND SKIP TO Q60.1]
- b. Were these steps at all influenced by your association with MPP or your Partner?  
Yes [Y], No [N], dk [DK]  
[IF NO SKIP TO Q60.1, IF YES CONTINUE]
- i. Can you or someone else identify the energy efficiency steps you're taking outside of MPP including specific efficiency design elements or equipment installed? Yes [Y], No [N], dk [DK]
- ii. [IF YES] LINE UP CALL WITH ENGINEER] Rather than take time now, can you provide me with their contact information so one of our engineers can speak with or exchange emails with them later, to get detailed energy savings estimates for these projects?

RECORD:

Name:

Company:

Cell Ph#:

Office Ph#:

Email address:

Role on project:

[ALL]

Q60.1 – Do you own or manage any existing multifamily buildings in New York State?

Yes [Y], No [N], dk [DK]

[IF NO/DK, SKIP TO Q70]

[IF YES, CONTINUE]

Q61. Did your organization implement any energy efficiency (natural gas or electric) measures during the last two years at any of your existing multifamily properties in New York State (excluding Long Island) that did NOT receive incentives from any NYSERDA or utility program?

Yes [Y], No [N], dk [DK]

[IF NO SKIP TO Q66]

[IF YES, CONTINUE]

Q61.1 Were these un-incented efficiency upgrades preformed before or after you first became involved in your first MPP project?

Before [B], After [A], Both before and after [BA], dk [DK]

IF BEFORE OR DK, SKIP TO Q66]

[IF AFTER OR BOTHE BEFORE AND AFTER, CONTINUE]

Q61.2 [INTERVIEWER: IF BOTH BEFORE AND AFTER, SAY “Thinking about the un-incented upgrades that were preformed after you first became involved in MPP”] Were these un-incented efficiency upgrades influenced at all by your participation in MPP? Yes[Y], No [N], dk [DK]

[IF NO or DK, SKIP TO Q66]

[IF YES, CONTINUE]

Q62. [INTERVIEWER: IF BOTH BEFORE AND AFTER, SAY “Thinking about the un-incented upgrades that were preformed after you first became involved in MPP”] In how many multifamily buildings in NYS did you install energy efficiency measures – that is, measures that exceeded the applicable energy codes – that did not receive incentives? \_\_\_\_\_

Q63. Did any of the following people provide you advice on what energy efficiency features to include in those buildings you just mentioned? [Multiple responses allowed]

a. Internal staff: Selected [S]

b. MPP Partner: Selected [S]

c. Architect/Engineer (not Partner): Selected [S]

d. Energy Efficiency Consultant/LEED Consultant: Selected [S]

e. Product Vendor: Selected [S]

f. Other: Other SPECIFY:

g. Refused [RF]

h. Don't know [DK]

[IF Q60 AND Q61= NO, SKIP TO Q66]

[IF Q60 AND Q61= YES, VERIFY THAT CONTACT COLLECTED ABOVE WILL BE ABLE TO ADDRESS Qs ABOUT NON-INCENTED PROJECTS TOO; IF NOT COLLECT ADDITIONAL CONTACT INFO BELOW]

[IF Q60 = NO AND Q61= YES, COLLECT CONTACT INFORMATION FOR PERSON KNOWLEDGEABLE ABOUT NON-INCENTED PROJECTS]

Q64. For the projects that didn't qualify for incentives, can you or someone else identify these projects and the specific efficiency design elements and equipment installed?

Yes, same contact as before [Y1], Yes, new contact [Y2], No, no one can provide that information [N], dk [DK]

IF Y2... collect contact info below:

[IF "Yes, new contact," COLLECT HERE FOR NON-INCENTED PROJECTS; ELSE skip to Q66]

Q65. What is their contact information?

RECORD:

Name:

Company:

Cell Ph#:

Office Ph#:

Email address:

Role on project:

Q66. Thinking of the multifamily property you have owned or managed the longest, how many years have you owned or managed that property? Enter # or dk [DK]

a. How many units are in this complex. Enter # or dk [DK]

Q67. When was the last time you renovated the building? Enter Year or dk [DK]

Q68. At that time, did the renovation include ...

a. ...upgrading the heating and cooling equipment in that building?

Yes [Y], No [No], dk [DK]

i. [IF NO] When was that last upgraded? Enter Year:

b. ...upgrading the interior lighting in common areas where you pay the bill?

Yes [Y], No [No], dk [DK]

i. [IF NO] When was that last upgraded? Enter Year:

c. ...upgrading all of the exterior lighting in areas where you pay the bill?

Enter Year or dk [DK]



- i. [IF NO] When was that last upgraded? Enter Year:

Q69. How many years do you think it will be before you renovate this property (again)? Enter # or dk [DK]

### Overall Program Experience

We'll close with general questions about your MPP experience.

Q70. Using a 0 to 10 scale, where 0 means "not at all satisfied" and 10 means "extremely satisfied," please rate the extent of your satisfaction with MPP on the following topics. If a topic doesn't apply to you, please let me know [ENTER 0-10, DK, or N/A] Let's start with...your level of satisfaction with MPP for...

- a. ...how clearly your Partner explained the steps required by the program Enter # OR NA:
- b. ...maximizing your project's energy savings potential Enter # OR NA:
- c. ... technical assistance provided by Partner Enter # OR NA:
- d. ... allowing flexibility for you in project scoping Enter # OR NA:
- e. ...timeliness of incentive payments Enter # OR NA:
- f. ... its overall ease of the inspection process Enter # OR NA:
- g. [IF CONSTRUCTION COMPLETED] performance of efficiency items installed Enter # OR NA:
- h. [IF CONSTRUCTION COMPLETED] improving energy savings for tenants Enter # OR NA:

Q71. Have any program requirements slowed the pace of this project compared to the pace of similarly sized projects you've done outside of the MPP? Yes [Y], No [No], dk [DK]

- a. [IF YES] What program requirements, including approval processes, contributed to this comparatively slower pace? \_\_\_\_\_

Q72. What, if any other suggestions do you have for improving the program?

Q73. Using a scale of 0 to 10, where 0 means "not at all important" and 10 means "extremely important," how important is it that your energy efficiency information come from an independent consultant not affiliated with the contractors or vendors that install or provide equipment? [ENTER 0-10 or DK]

[IF Q6.1=All or Some]

Q73.1 You mentioned that at least one of your recent MPP projects was terminated before the project totally completed the MPP process. Which of the following reasons were behind the termination? [READ CHOICES] [Select all that apply]

- a. Reasons internal to your company

- b. Economic/market reasons
- c. The MPP program itself (including partners)
- d. Other (describe):  
[If C IS SELECTED]

Q73.2 What elements of the MPP program motivated you to prematurely terminate your MPP project?

---

Q74. Would you like to add anything about the MPP or your experience with it that I have not asked about?

Yes [Y], No [No], dk [DK]

- a. [IF YES, RECORD:]

Thank you for your valuable feedback.

## Eligible-Experienced Program Partners' Interview Guide

Date:

Contact Name:

Contact Organization:

Contact Phone:

Interviewer:

## Database Inputs

Sample assignment:

Existing Buildings Partner (**EP**), New Construction Partner (**NC**), Both (**B**), Neither (**Z**)

Partner status:

Experienced, Active, Eligible (**EAE**)  
 Experienced, Inactive, Eligible (**EIE**)  
 In-process (first project) Experienced, Active (**IEA**)

## Intro

Hello, my name is \_\_\_\_\_ with Research Into Action. Thanks for taking the time to talk today about NYSERDA's Multifamily Performance Program. As part of NYSERDA's continual improvement activities to enhance its program, we are interviewing firms like yours that are eligible to provide technical assistance with multifamily projects.

Are you the best person from your firm to talk about your firm's involvement with the Multifamily Performance Program, or MPP as it is commonly called? [IF NOT, OBTAIN NEW CONTACT INFORMATION] \_\_\_\_\_

I anticipate we will need about an hour. We will keep your responses confidential to the full extent of the law; nothing you say will be identified with you in our reports. I'll be audio recording this interview to ensure the accuracy of my notes. The recording will only be used by Research Into Action staff and will not be provided to NYSERDA.

Do you have any questions before we get started? \_\_\_\_\_

### Respondent Characteristics

First, I have a few questions about yourself and your role in the firm.

F1. [ASK ALL] What is your title in the firm?

\_\_\_\_\_

F2. [ASK ALL] What is your role with MPP?

\_\_\_\_\_

Q3. [ASK ALL] Since joining your firm, how long have you worked on MPP-related projects?

1\_\_\_\_\_ years

2\_DK

Q4. [ASK ALL] On average, what percent of *your* time is spent on MPP-related projects?

1\_\_\_\_\_%

2\_DK

### Firmographics

Next, I'd like to learn a little about your firm to make sure we've heard from all the different types of Partner firms in New York State.

#### Firm Size & MF Experience:

F5. [ASK ALL] About how many people does your firm employ?

1\_\_\_\_\_employees

2\_DK

F6. [ASK ALL] About how many of these employees serve clients in New York State?

1\_\_\_\_\_employees

2\_DK

- F7. [ASK ALL] And, for your work in the multifamily sector, about how many employees work on multifamily projects in New York State?  
1\_\_\_\_\_employees  
2\_DK
- F8. [ASK ALL] About how many employees are involved in multifamily projects supported by NYSERDA's Multifamily Performance Program (MPP) in New York State?  
1\_\_\_\_\_employees  
2\_DK
- F9. [ASK ALL] Has the number of employees involved in multifamily services in New York State grown since you joined MPP?  
1\_Yes  
2\_No → SKIP to F11  
3\_DK → SKIP to F11
- F10. [IF F9 = YES] What factors contributed to the growth in your multi-family service employees?  
[ME]  
\_\_\_\_\_
- F11. [ASK ALL] What is the approximate annual revenue from your firm's work in New York State?  
[PROBE: If respondent does not know \$\$, ask for number of jobs]  
1\_\_\_\_\_dollars OR  
2\_\_\_\_\_number of projects  
3\_DK
- F12. [ASK ALL] What percentage of your overall business in New York State is associated with multifamily buildings?  
1\_\_\_\_\_ %  
2\_DK
- F13. [ASK ALL] What percentage of your multifamily work in New York State is connected to MPP projects?  
1\_\_\_\_\_ %  
2\_DK

## MF/MPP Services &amp; Scope:

F14. [ASK ALL] Is your MPP work limited to specific geographical areas in New York State?

1\_Yes

2\_No → SKIP to F17

F15. [IF F14 = Yes] Where?

---

F16. [IF F14 = YES] Why have you not pursued projects outside this/these geographic area(s)? [ME]

---

F17. [ASK ALL] Does your firm provide each of the following services to multifamily buildings in New York State?

a. New building construction 1\_Yes 2\_No 3\_DK

b. Renovations/Remodeling 1\_Yes 2\_No 3\_DK

c. New building architectural design 1\_Yes 2\_No 3\_DK

b. Retrofit architectural design 1\_Yes 2\_No 3\_DK

c. Project oversight 1\_Yes 2\_No 3\_DK

d. New building engineering design 1\_Yes 2\_No 3\_DK

[IF UNCLEAR TO CONTACT: any type of design: structural, mechanical, or electrical]

e. Retrofit engineering design 1\_Yes 2\_No 3\_DK

[IF UNCLEAR TO CONTACT: any type of design: structural, mechanical, or electrical]

f. Retro commissioning services 1\_Yes 2\_No 3\_DK

g. Building or system energy audits 1\_Yes 2\_No 3\_DK

h. Whole building energy modeling 1\_Yes 2\_No 3\_DK

i. LEED building design 1\_Yes 2\_No 3\_DK

j. Installation of equipment 1\_Yes 2\_No 3\_DK

k. Other [please specify:] \_\_\_\_\_

## Other Programs

F18. [ASK ALL] What about other programs in New York? Is your business involved in, or does it participate in, any other *NYSERDA programs*?

1\_Yes

2\_No → SKIP to F21

3\_DK → SKIP to F21

F19. [IF F18 = YES] Which programs?

---

- F20. [IF F18 = YES] What percentage of your overall business in NYS involves these programs?  
1\_\_\_\_\_ %  
2\_DK
- F21. [ASK ALL] Is your business involved or does it participate in any New York utility programs?  
1\_Yes  
2\_No → SKIP to F24  
3\_DK → SKIP to F24
- F22. [IF F21 = YES] Which programs?  
\_\_\_\_\_
- F23. [IF F21 = YES] What percentage of your overall business in NYS involves these programs?  
1\_\_\_\_\_ %  
2\_DK

### MF Work Before Becoming Partner

Next, I have a few questions about your business before you became an MPP Partner.

- F24. [ASK ALL] Before you became a Partner, was your firm involved in providing energy efficiency services to multifamily properties in New York State?  
1\_Yes  
2\_No → SKIP to MCA38
- MF25. [IF F24 = YES] Before becoming an MPP Partner, did you actively market these services to multifamily customers?  
1\_Yes  
2\_No  
3\_DK
- MF26. [IF F24 = YES] In the year before you became a Partner, what percentage of all of your business was from multifamily energy efficiency projects?  
1\_\_\_\_\_ %  
2\_DK
- MF27. [IF F24 = YES] And, what percentage of this work was supported by utility or government programs [other than MPP]?  
1\_\_\_\_\_ %  
2\_DK

- MF28. [IF F24 = YES] Were the energy efficiency services you provided before becoming a Partner similar or different to what you now do as a Partner for MPP? [ME]  
1\_Similar → SKIP to MF30  
2\_Different  
3\_DK → SKIP to MF30
- MF29. [If F24 = YES AND MF28 = DIFFERENT] How were they different? [ME]  
\_\_\_\_\_
- MF30. [If F24 = YES] Before becoming a Partner, did you provide an equivalent to the Energy Reduction Plan (ERP, a comprehensive assessment with modeled savings estimates)? [ME]  
1\_Yes  
2\_No → SKIP to MF36  
3\_DK → SKIP to MF36
- MF31. [If MF30 = YES] Was this service connected to LEED projects?  
1\_Yes  
2\_No  
3\_DK
- MF32. [IF F24 AND MF30 = YES] What percentage of your [If Q32 = YES → READ: non-LEED] multifamily projects did you provide an ERP or equivalent before becoming a Partner? [PROBE: If percentage is unknown, ask for never, rarely, sometimes, often, or always] [ME]  
1\_\_\_\_\_ % OR  
2\_Never  
3\_Rarely  
4\_Sometimes  
5\_Often  
6\_Always  
7\_DK
- MF33. [IF F24 AND MF30 = YES] Overall, for what percentage of your firm's projects did your ERPs include detailed cost estimates? [ME]  
1\_\_\_\_\_ %  
2\_DK
- MF34. [IF F24 AND MF30 = YES] Before becoming a Partner, what percentage of your firm's new construction projects achieved at least 15% savings over applicable ASHRAE codes? [ME]  
1\_\_\_\_\_ %  
2\_DK

MF35. [IF F24 AND MF30 = YES] What percentage of your firm's existing buildings projects saved 15% of current gas and electricity use combined? [ME]

1 \_\_\_\_\_ %

2\_DK

MF36. [IF F24 = YES] Before you became an MPP Partner, in approximately what percentage of sales situations did you recommend the energy efficiency measures for which MPP currently provides incentives? [ME]

1 \_\_\_\_\_ %

2\_DK

### MCA-Related

I also have a few questions about your firm's multifamily and energy efficiency business outside MPP since you became an MPP Partner.

### Spillover

MCA37. [ASK ALL] Since becoming an MPP Partner, has your firm provided energy efficiency services to multifamily projects in New York State without the support of MPP?

1\_Yes

2\_No → SKIP to MCA55

3\_DK → SKIP to MCA55

MCA38. [IF MCA37 = YES] To what types of non-MPP multifamily projects are you providing these services? [For example, ownership type, building type, existing or potential clients, other characteristics?] [ME]

\_\_\_\_\_

MCA39. [IF MCA37 = YES] For what percentage of these projects do you provide an equivalent to the ERP [a comprehensive assessment with modeled savings estimates]? [ME]

1 \_\_\_\_\_ %

2\_None

3\_DK

MCA40. [IF MCA39 > 0] On average, when you provide an ERP or equivalent for your non-MPP multifamily projects, do you use MPP's ERP process or a modified ERP approach?

1\_MPP's ERP process → SKIP to MCA45

2\_Modified ERP approach

3\_DK → SKIP to MCA45

MCA41. [IF MCA40 = Modified ERP approach] What did you modify about the ERP?



---

MCA42. [IF MCA40 = Modified ERP approach] What, if anything, is simpler about your modified ERP vs. the MPP ERP?

---

MCA43. [IF MCA40 = Modified ERP approach] Did you get the same results from owners in terms of their understanding and actions taken compared to when you used the MPP ERP?

1\_Yes

2\_No

3\_DK

MCA44. [IF MCA40 = Modified ERP approach] Do you think your modified approach could be adapted for MPP?

1\_Yes

2\_No

3\_DK

MCA45. [IF MCA37 = YES] Since becoming a Partner, has your firm provided energy efficiency services [If MCA39 > 0 → READ: aside from an ERP,] to non-MPP multifamily projects in addition to what you were providing prior to becoming a Partner?

1\_Yes

2\_No → SKIP to MCA52

3\_DK → SKIP to MCA52

MCA46. [IF MCA45 = Yes] What services? [ME]

---

MCA47. [IF MCA45 = Yes] Are these services you developed through participation in MPP?

1\_Yes

2\_No

MCA48. [IF MCA45 = YES] Can you or someone else in your firm identify specific non-MPP multifamily projects where you applied these services?

1\_Yes

2\_No → SKIP to MCA50

MCA49. [IF MCA48 = YES] Rather than take time now, who should one of our engineers talk to, or exchange emails with, to get detailed energy savings estimates for these projects?

\_\_\_\_\_ Name    \_\_\_\_\_ Phone    \_\_\_\_\_ Email

MCA50. [IF MCA48 = Yes] Why do these multifamily projects not come through MPP?

---

MCA51. [IF MCA48 = Yes] To what extent do you think your MPP Partner status or experience contributed to your firm getting these non-MPP multifamily projects? [ME]

- 1\_A lot
- 2\_Some
- 3\_A little
- 4\_None at all
- 5\_DK

MCA52. [IF MCA37 = YES] Overall, during the past two years did NYSERDA's Multifamily Program have any effect on the demand or interest from non-MPP multifamily clients for your energy efficiency services? [ME]

- 1\_Increased
- 2\_Stayed about the same → SKIP to MCA55
- 3\_Decreased → SKIP to MCA55
- 4\_DK → SKIP to MCA55

MCA53.[IF MCA52 = INCREASED] By what percentage? [PROBE: If percent is unknown, ask for *a lot, some, a little*] [ME]

- 1\_\_\_\_\_ % OR
- 2\_A lot
- 3\_Some
- 4\_A little
- 5\_DK

MCA54. [IF MCA52 = INCREASED] What do you think is contributing to this increased demand? [ME]

---

MCA55. [ASK ALL] Since becoming a Partner, has your firm provided energy efficiency services to other types of commercial or residential clients [not multifamily] in New York State?

- 1\_Yes
- 2\_No → SKIP to MCA59
- 3\_DK → SKIP to MCA59

MCA56. [IF MCA55 = YES] Has the Multifamily Program affected the demand or interest from these other types of clients for your energy efficiency services? [ME]

- 1\_Increased
- 2\_Stayed about the same → SKIP to MCA59

3\_Decreased

4\_DK → SKIP to MCA59

MCA57. [IF MCA56 = Increased OR Decreased] By how much has it [ANSWER]? [Record \$\$ or number of projects] [ME]

1\_\_\_\_\_ dollars OR

2\_\_\_\_\_ number of projects

3\_DK

MCA58. [IF MCA56 = Increased] Which specific types of energy efficient equipment or measures are you installing more often for your non-multifamily customers because of NYSERDA's MPP? [ME]

\_\_\_\_\_

MCA59. [ASK ALL] Has your firm been supplying energy efficiency services beyond NY State? [ME]

1\_Yes

2\_No → SKIP to FR64

3\_DK → SKIP to FR64

MCA60. [IF MCA59 = YES] Where? [ME]

\_\_\_\_\_

MCA61. [ASK ALL] Over the past five years, has your firm's service territory increased, decreased, or stayed about the same?

1\_Increased

2\_Stayed same

3\_Decreased

4\_DK

MCA62. [IF MCA37 OR MCA55 OR MCA59 = YES] Overall, outside of MPP, who has been most receptive to your firm's energy efficiency services? [PROBE: industry/market segments, other market actors]

\_\_\_\_\_

MCA63. [IF MCA37 OR MCA55 OR MCA59 = YES] Who has been least receptive to your firm's energy efficiency services outside of MPP? [PROBE: industry/market segments, other market actors]

\_\_\_\_\_

Freeridership: [Ask If Q25 = Yes]

Next, I am going to ask you to rate the importance of MPP in influencing your decision to recommend the Energy Efficiency measures that qualify for incentives through the program to Multifamily Owners and Property Managers served by your company. [I'll refer to these collectively as 'MPP-incented measures'.]

FR64. If the MPP incentives, program services, and information were not available, what percentage of your firm's current MPP-supported multifamily projects would be doing an ERP-type modeling assessment? [ME]

1\_\_\_\_\_%

2\_DK

FR65. If the MPP incentives, program services, and information were not available, would you recommend all, some, or none of the MPP-incented measures to multifamily customers? [ME]

1\_All

2\_Some

3\_None

4\_DK

FR66. [IF FR65 = SOME] Which measures would you not likely recommend?

\_\_\_\_\_

FR67. What about for projects in which you are trying to achieve 15% energy savings? Would you recommend all, some, or none of the MPP-incented measures if the MPP incentives, services, and information were not available? [ME]

1\_All → SKIP to FR69

2\_Some

3\_None → SKIP to FR69

4\_DK → SKIP to FR69

FR68. [IF FR67 = SOME] Which measures would you not likely recommend?

\_\_\_\_\_

FR69. Since becoming an MPP Partner, in approximately what percentage of situations with multifamily clients do you recommend all the MPP-incented measures? [ME]

1\_\_\_\_\_%

2\_DK

FR70. Are there any situations in which you encourage your customers not to purchase energy efficient measures if they do qualify for an MPP incentive?

1\_Yes

2\_No → SKIP to FR72

3\_DK → SKIP to FR72

FR71. [IF FR70 = YES] Please explain.

\_\_\_\_\_

FR72. About what percent of your business is in locations where MPP incentives are not offered?

1\_\_\_\_\_%

2\_None

3\_DK

FR73. [IF FR72 > 0] In what percent of sales situations do you recommend any MPP-incented measures in these locations [where MPP incentives are not offered]? [ME]

1\_\_\_\_\_%

2\_DK

## Reasons For Joining MPP & Program Participation

Next, I have a few questions about your participation in the program.

PP74. [ASK ALL] What motivated you to become an MPP Partner?

\_\_\_\_\_

PP75. [ASK ALL] Have you worked on any MPP projects that involve heating oil?

1\_Yes

2\_No → SKIP to MA82

3\_DK → SKIP to MA82

PP76. [IF PP75 = Yes] What issues are there, if any, with dealing with oil that are different from electricity and natural gas?

\_\_\_\_\_

PP77. Since becoming a Partner, have you done any MPP-supported projects of each of the following types?

a. New construction

1\_Yes 2\_No 3\_DK

b. Retrofit of existing building

1\_Yes 2\_No 3\_DK

c. Market rate building

1\_Yes 2\_No 3\_DK

d. Affordable rate building

1\_Yes 2\_No 3\_DK

PP78. [ASK ALL] The program closed down between July 2009 and September 2010. How, if at all, did this affect your business?

---

PP79. [If Active/Experienced/Eligible AND has a V5 project] Our records show that you have participated in a Version 5 project and in earlier ones as well. How have things been working out since July 2012? [FODDER: Expectations being met? Why/Why not? Different from V4? How?]

---

PP80. [IF Active/Experienced AND NO V5 Project] Our records show that you participated in earlier versions of the program, but you have not started a project since the summer of 2012. Why is that?

---

PP81. [IF Active/New with a project in pipeline OR initiated first MPP project since January 2012] Our records show that you have at least one project that is still in progress. How far are you in that project (those projects)?

---

## Marketing

MA82. [ASK ALL] Before you inform your multifamily clients about MPP, what is their general level of awareness of MPP (that is, on average or typically)? Would you say: [READ LIST]

1\_No awareness

2\_Low (such as they know NYSERDA offers incentives and support, or they know the name of the program)

3\_Some (they know some details)

4\_High (they know most of the details regarding incentives and procedures)

5\_DK

MA83. [ASK ALL] Do you currently market your MPP services?

1\_Yes

2\_No → SKIP to MA89

MA84. [If MA83 = YES] How and to whom do you market the program?

---

MA85. [IF MA83 = YES] Do you advertise or promote your MPP Partner status in your marketing activities?

1\_Yes

2\_No

3\_DK

MA86. [IF MA83 = YES] What, if any, MPP marketing materials do you use? [FODDER: website, brochures, etc.]

1\_\_\_\_\_ specify materials

2\_None

MA87. [IF MA83 = YES AND MA85 ≠ NONE] How, if at all, do these MPP marketing materials help you in promoting the program?

\_\_\_\_\_

MA88. [IF MA83 = YES] What support, if any, could NYSERDA provide to help with your marketing?

\_\_\_\_\_

MA89. [ASK ALL] Thinking of all your MPP projects, what portion do you initiate compared to the portion of MPP projects that clients suggest to you?

1\_\_\_\_\_ %

2\_DK

MA90. What attracts multifamily clients to MPP? [FODDER: Energy savings, advice, incentives, etc.]

\_\_\_\_\_

## Processes

Next, I'd like to hear about your firm's general experience with MPP.

## Screening/Customer Engagement

PCEF91. [ASK ALL] Since becoming an MPP Partner, have you received more inquiries from multifamily building owners, developers, or managers about your energy efficiency services?

1\_Yes

2\_No → SKIP to Q90

3\_DK → SKIP to Q90

PCEF92. [IF PCEF91 = YES] What is the percentage increase in the number of inquiries you have received since becoming a Partner? [PROBE: If percentage is unknown, ask a lot, some, or a little] [ME]

1\_\_\_\_\_ %

2\_A lot

3\_Some

4\_A little

5\_DK

PCEF93. [ASK ALL] How about this year [2013]? Have you noticed an increase, decrease, or no change in the number of leads from the program? [ME]

1\_Increase

2\_No Change

3\_Decrease

4\_DK

PCEF94. [ASK ALL] How do you evaluate or screen for potential MPP projects?

---

PCEF95. [ASK ALL] What percentage of potential projects do you screen out?

1\_\_\_\_\_%

2\_DK

4\_None

PCEF96. [IF PCEF95 > 0] For what reasons are they typically screened out?

---

### Financing

PCEF97. [ASK ALL] What percentage of MPP projects are self-funded (i.e. use own money vs. borrowed money)?

1\_\_\_\_\_%

2\_DK

PCEF98. [IF SAMPLE TYPE = NEW CONSTRUCTION] After the MPP Design Team meeting, what percentage of MPP new construction projects need additional funding to be completed?

1\_\_\_\_\_%

2\_DK

PCEF99. [ASK ALL] Do you help MPP clients get additional funding when needed?

1\_Yes

2\_No

3\_DK

PCEF100. [IF PCEF99 = YES] How? [FODDER: GJGNY, commercial lending, private investment, other sources]

---

PCEF101. [ASK ALL] Have you looked into the Green Jobs Green New York financing option? I am interested in hearing your thoughts about it, including any experiences you have had with it.

---

### Application Process

Next, I would like for you to tell me about your experience with the MPP application process.



PAP102. [ASK ALL] What issues or challenges arise with submitting an application? [FODDER: forms amassed and filled out, uploading to CRIS database, etc.]

---

PAP103. [ASK ALL] What issues or challenges arise during the application approval process?

---

PAP104. [IF ANY MENTIONED] How might the application process be improved?

---

PPP105. [IF SAMPLE TYPE = NEW CONSTRUCTION; ELSE SKIP → Q113] For what percentage of new construction multifamily projects do you recommend MPP's prescriptive path to clients?

1\_\_\_\_\_%

2\_None

3\_DK

PPP106. [IF SAMPLE TYPE = NEW CONSTRUCTION] Under what circumstances do you recommend the prescriptive path?

---

PPP107. [IF SAMPLE TYPE = NEW CONSTRUCTION] How well is the prescriptive path working?

[INTERVIEWER: They may have an opinion despite not using it.]

---

PPP108. [IF SAMPLE TYPE = NEW CONSTRUCTION] How, if at all, could the prescriptive path be improved? [INTERVIEWER: They may have an opinion despite not using it.]

---

**[IF SAMPLE TYPE = NEW CONSTRUCTION → SKIP to PSPP116]**

PPP109. [IF SAMPLE TYPE = EXISTING] For what percentage of existing building multifamily projects do you recommend the fast track path?

1\_\_\_\_\_%

2\_None

3\_DK

PPP110. [IF SAMPLE TYPE = EXISTING] Under what circumstances do you recommend the fast track path to your clients?

---

PPP111. [IF SAMPLE TYPE = EXISTING] How well is the fast track path working? [INTERVIEWER: They may have an opinion despite not using it.]

---

PPP112. [IF SAMPLE TYPE = EXISTING AND Q113 > 0] How, if at all, could the Fast Track path be improved? [INTERVIEWER: They may have an opinion despite not using it.]

\_\_\_\_\_

PPP113. [IF SAMPLE TYPE = EXISTING AND Q113 > 0] What impact has that path had on your ability to promote projects?

\_\_\_\_\_

PPP114. [IF SAMPLE TYPE = EXISTING AND Q113 > 0] What are the disadvantages of the Fast Track path for you?

\_\_\_\_\_

PPP115. [IF SAMPLE TYPE = EXISTING AND Q113 > 0] Program staff inspects all Fast Track projects after the upgrades have been installed. What are your role and responsibilities with the inspection process?

\_\_\_\_\_

### Scoping and the Energy Reduction Planning Process:

Next, I have some questions about the Energy Reduction Plan process to help us understand how you and the client arrive at the ERP that goes to NYSERDA staff.

PSPP116. [IF SAMPLE TYPE = EXISTING] How does benchmarking fit into your Energy Reduction Plan?

\_\_\_\_\_

PSPP117. What issues or challenges do [clients OR the design team] have during the scoping or benchmarking stage? [FODDER: Staff time involved, delays with project launch, disagreements over program measures recommended measures.]

\_\_\_\_\_

PSPP118. Do you have any issues with the tools you use while developing the ERP? What?

[IF SAMPLE TYPE = EXISTING] BENCHMARKING TOOL PROBLEMS:

1\_\_\_\_\_

[IF SAMPLE TYPE = NEW CONSTRUCTION] MODELING TOOL PROBLEMS:

2\_\_\_\_\_

3\_No issues

PSPP119. [If Issues Are Mentioned in PSPP118] What are some possible solutions?

a. [IF SAMPLE TYPE = EXISTING] BENCHMARKING TOOL POSSIBLE SOLUTIONS:

b. [IF SAMPLE TYPE = NEW CONSTRUCTION] MODELING TOOL POSSIBLE SOLUTIONS:

PSPP120. What is the client's role in the ERP process?

---

PSPP121. How long does it take for NYSERDA's approval after you have submitted the ERP?

---

PSPP122. [IF EXISTING] How do you handle potential upgrades that do not meet minimum savings?

---

PSPP123. Is that the case for both large and small building projects? [NOTE: 50+ units are "large."]

1\_Yes

2\_No → SKIP to PSPP125

3\_DK → SKIP to PSPP125

PSPP124. How does it differ?

---

PSPP125. And, does that differ between market rate and affordable housing building projects?

1\_Yes

2\_No → SKIP to PSPP127

3\_DK → SKIP to PSPP127

PSPP126. How does it differ?

---

PSPP127. How has the requirement that each measure must individually be cost effective affected your projects? [FODDER: If not provided, ask about impact on customer recruitment or types of projects, limits program participation, etc.]

---

PSPP128. [IF SAMPLE TYPE = NEW CONSTRUCTION] Have you contacted TRC, the program's implementation contractor, with questions or concerns?

1\_Yes

2\_No → SKIP to RP132

3\_DK → SKIP to RP132

PSPP129. [IF SAMPLE TYPE = EXISTING] Have you contacted the NYSERDA Staff with questions or concerns?

1\_Yes

2\_No → SKIP to RP132

3\_DK → SKIP to RP132

PSPP130. Are they reasonably easy to contact?

1\_Yes

2\_No

PSPP131. [If Q135 = Yes] What do you discuss with them?

---

## Reporting

[Establish that Partner has gotten to the reporting stage with any of their MPP projects]

RP132. [ASK ALL] What reporting to the program do you do after the client agrees on the scope of the MPP project?

1\_\_\_\_\_ specify

2\_No reporting

RP133. [If RP132 ≠ No reporting] Are there any issues or challenges with the reporting process?

1\_Yes

2\_No → SKIP to RP136

3\_DK → SKIP to RP136

RP134. [IF RP133 = YES] What issues or challenges are there?

---

RP135. [IF ANY MENTIONED] How might the reporting process be improved or streamlined?

---

RP136. [If RP132 ≠ No reporting] Has a program reviewer ever questioned the estimates or other information you have submitted?

1\_Yes

2\_No → SKIP to RP138

3\_DK → SKIP to RP138

RP137. [IF RP136 = YES] What did you do to address the questions?

---

RP138. [If RP132 ≠ No reporting] What might help to improve the review and project approval process?

---

## T&V and Inspections:

[Verify that Partner has projects in or past the inspection stage; else skip]

TVI139. What responsibilities do you have for testing and verification during project construction?

[FODDER: If not provided, ask about number of inspections, timeframe, project delays, anything else.]

\_\_\_\_\_

TVI140. What, if any, recommendations do you have for streamlining the inspection processes?

\_\_\_\_\_

TVI141. What role do you have in inspections conducted by program staff *after construction is completed*?

\_\_\_\_\_

TVI142. What, if any, issues are typically identified at this stage?

\_\_\_\_\_

TVI143. How are they resolved?

\_\_\_\_\_

TVI144. How, if at all, might the final inspection process be streamlined or improved?

\_\_\_\_\_

TVI145. Have you had any projects that were abandoned?

1\_Yes

2\_No → SKIP to PS147

3\_DK → SKIP to PS147

TVI146. [If TVI145 = Yes] Why? \_\_\_\_\_

## Program Support

We are getting close to the end of our questions about program processes. I'd like to learn about any services the program provides to support your Partner role.

PS147. [ASK ALL] Have you used the Partner Portal?

1\_Yes

2\_No → SKIP to PS150

PS148. [If PS147 = Yes] For what?

\_\_\_\_\_

PS149. [If PS147 = Yes] What suggestions, if any, do you have to improve the Portal?

\_\_\_\_\_

PS150. [ASK ALL] Do you attend NYSERDA's regularly-scheduled Partner webinar meetings?

1\_Yes

2\_No → SKIP to PS153

PS151. [If PS150 = Yes] How are they useful?

---

PS152. [If PS150 = Yes] What would make them more useful?

---

PS153. [ASK ALL] Do you attend NYSERDA's annual MPP Partner conferences?

1\_Yes

2\_No → SKIP to PS156

PS154. [If PS153 = Yes] How are they useful?

---

PS155. [If PS153 = Yes] What would make them more useful?

---

PS156. [ASK ALL] Do you think it would be helpful if NYSERDA provided any additional training for Partners?

1\_Yes

2\_No → SKIP to Q158

PS157. [If PS156 = Yes] Please explain.

---

PS158. [ASK ALL] Thinking about the time from when you started as a Partner until now, what other support, if any, has NYSERDA provided to help you in your role as an MPP Partner?

---

PS159. [ASK ALL] What, if anything, has prevented you from being more successful with MPP?

---

PS160. How could MPP support Partners better in the future?

---

Thank you for helping us with our ongoing research. As a show of our appreciation we'd like to send a \$125 check [from RIA] to you or a charity of your choice. Let me verify your contact information.

\_\_\_\_\_Name \_\_\_\_\_Address (#, Street, City, State, Zip)

## Appendix B. Market Actor Statistical Analysis

**Table B-1. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Work on Multifamily Projects<sup>a</sup>**

Comparison Groups	Percentages	Test Statistic (p-value)
NY vs. PA	42% vs. 31%	$\chi^2=18.28, p<.001$
NY Upstate vs. NY Downstate	48% vs. 41%	$\chi^2=4.36, p=.04$
NY Architects vs. NY Engineers	48% vs. 62%	$\chi^2=9.68, p= 0.002$
NY Architects vs. NY Contractors	48% vs. 33%	$\chi^2=26.64, p <.001$
NY Architects vs. NY EE Consultants	48% vs. 58%	$\chi^2=3.64, p= 0.06$
NY Engineers vs. NY Contractors	62% vs. 33%	$\chi^2=52.41, p <.001$
NY Engineers vs. NY EE Consultants	62% vs. 58%	$\chi^2=0.54, p= 0.46$
NY Contractors vs. NY EE Consultants	33% vs. 58%	$\chi^2=29.13, p <.001$
Downstate Architects vs. Upstate Architects	45% vs. 56%	$\chi^2=3.06, p= 0.08$
Downstate Engineers vs. Upstate Engineers	67% vs. 49%	$\chi^2=5.08, p= 0.02$
Downstate Contractors vs. Upstate Contractors	32% vs. 40%	$\chi^2=2.31, p= 0.13$
Downstate EE Consultants vs. Upstate EE Consultants	64% vs. 47%	$\chi^2=3.56, p= 0.06$
PA Architects vs. PA Engineers	44% vs. 42%	$\chi^2=0.08, p= 0.78$
PA Architects vs. PA Contractors	44% vs. 21%	$\chi^2=20.08, p <.001$
PA Architects vs. PA EE Consultants	44% vs. 18%	$\chi^2=12.36, p <.001$
PA Engineers vs. PA Contractors	42% vs. 21%	$\chi^2=12.22, p <.001$
PA Engineers vs. PA EE Consultants	42% vs. 18%	$\chi^2=9.09, p= 0.003$
PA Contractors vs. PA EE Consultants	21% vs. 18%	$\chi^2=0.3, p= 0.58$
NY Architects vs. PA Architects	48% vs. 44%	$\chi^2=0.63, p= 0.43$
NY Engineers vs. PA Engineers	62% vs. 42%	$\chi^2=8.47, p= 0.004$
NY Contractors vs. PA Contractors	33% vs. 21%	$\chi^2=9.48, p= 0.002$
NY EE Consultants vs. PA EE Consultants	58% vs. 18%	$\chi^2=25.41, p <.001$

<sup>a</sup> Reference to Table 7-3

**Table B-2. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Conduct Marketing Activities<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value)
NY vs. PA	46% vs. 62%	$\chi^2 =9.27, p=.002$
NY Upstate vs. NY Downstate	53% vs. 43%	$\chi^2 =3.38, p=.07$
NY Architects/Engineers vs. NY Contractors	46% vs. 35%	$\chi^2 =3.20, p=.07$
NY Architects/Engineers vs. NY EE Consultants	46% vs. 64%	$\chi^2 =5.95, p=.02$
NY Contractors vs. NY EE Consultants	35% vs. 64%	$\chi^2 =12.74, p<.001$
PA Architects/Engineers vs. PA Contractors	62% vs. 61%	$\chi^2 =.01, p=.92$
PA Architects/Engineers vs. PA EE Consultants	62% vs. 67%	$\chi^2 =.08, p=.77$
PA Contractors vs. PA EE Consultants	61% vs. 67%	$\chi^2 =.10, p=.75$
continued		

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value)
NY Architects/Engineers vs. PA Architects/Engineers	46% vs. 62%	$\chi^2 = 6.06$ , $p = .01$
NY EE Consultants vs. PA EE Consultants	64% vs. 67%	$\chi^2 = .03$ , $p = .87$
NY Contractors vs. PA Contractors	35% vs. 61%	$\chi^2 = 6.05$ , $p = .01$

<sup>a</sup> Reference to Table 6-5

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

**Table B-3. Results from Chi-Square Test Comparing the Percentage of Market Actors Are Aware of BPI's MF Building Analyst Certification<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	34% vs. 18%	$\chi^2 = 11.03$ , $p = .001$
NY Upstate vs. NY Downstate	42% vs. 29%	$\chi^2 = 5.64$ , $p = .02$
NY Architects/Engineers vs. NY Contractors	29% vs. 30%	$\chi^2 = .01$ , $p = .93$
NY Architects/Engineers vs. NY EE Consultants	29% vs. 53%	$\chi^2 = 10.75$ , $p = .001$
NY Contractors vs. NY EE Consultants	30% vs. 53%	$\chi^2 = 8.02$ , $p = .005$
PA Architects/Engineers vs. PA Contractors	16% vs. 11%	$\chi^2 = .49$ , $p = .49$
PA Architects/Engineers vs. PA EE Consultants	16% vs. 56%	$\chi^2 = 8.00$ , $p = .005^c$
PA Contractors vs. PA EE Consultants	11% vs. 56%	$\chi^2 = 8.08$ , $p = .004^c$
NY Architects/Engineers vs. PA Architects/Engineers	29% vs. 16%	$\chi^2 = 5.45$ , $p = .02$
NY EE Consultants vs. PA EE Consultants	53% vs. 56%	$\chi^2 = .30$ , $p = .86$
NY Contractors vs. PA Contractors	30% vs. 11%	$\chi^2 = 4.14$ , $p = .04$

<sup>a</sup> Reference to Table 6-78

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-4. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer New Building Construction Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	64% vs. 70%	$\chi^2 = 1.56$ , $p = .21$
NY Upstate vs. NY Downstate	59% vs. 66%	$\chi^2 = 1.64$ , $p = .20$
NY Architects/Engineers vs. NY Contractors	64% vs. 72%	$\chi^2 = 1.50$ , $p = .22$
NY Architects/Engineers vs. NY EE Consultants	64% vs. 51%	$\chi^2 = 3.48$ , $p = .06$
NY Contractors vs. NY EE Consultants	72% vs. 51%	$\chi^2 = 6.90$ , $p = .01$
PA Architects/Engineers vs. PA Contractors	69% vs. 79%	$\chi^2 = 1.24$ , $p = .27$
PA Architects/Engineers vs. PA EE Consultants	69% vs. 56%	$\chi^2 = .63$ , $p = .43^c$
PA Contractors vs. PA EE Consultants	79% vs. 56%	$\chi^2 = 2.00$ , $p = .16^c$
NY Architects/Engineers vs. PA Architects/Engineers	64% vs. 69%	$\chi^2 = .48$ , $p = .49$
NY EE Consultants vs. PA EE Consultants	51% vs. 56%	$\chi^2 = .07$ , $p = .79^c$
NY Contractors vs. PA Contractors	72% vs. 79%	$\chi^2 = .68$ , $p = .41$

<sup>a</sup> Reference to Table 6-69

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.



**Table B-5. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Renovation/Remodeling Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	74% vs. 66%	$\chi^2 = 3.08$ , $p = .08$
NY Upstate vs. NY Downstate	66% vs. 78%	$\chi^2 = 5.43$ , $p = .02$
NY Architects/Engineers vs. NY Contractors	78% vs. 79%	$\chi^2 = .07$ , $p = .80$
NY Architects/Engineers vs. NY EE Consultants	78% vs. 57%	$\chi^2 = 9.39$ , $p < .001$
NY Contractors vs. NY EE Consultants	79% vs. 57%	$\chi^2 = 8.31$ , $p = .004$
PA Architects/Engineers vs. PA Contractors	65% vs. 76%	$\chi^2 = 1.15$ , $p = .28$
PA Architects/Engineers vs. PA EE Consultants	65% vs. 44%	$\chi^2 = 1.51$ , $p = .22^c$
PA Contractors vs. PA EE Consultants	76% vs. 44%	$\chi^2 = 3.14$ , $p = .08^c$
NY Architects/Engineers vs. PA Architects/Engineers	78% vs. 65%	$\chi^2 = 4.75$ , $p = .03$
NY EE Consultants vs. PA EE Consultants	57% vs. 44%	$\chi^2 = .53$ , $p = .47^c$
NY Contractors vs. PA Contractors	79% vs. 76%	$\chi^2 = .12$ , $p = .73$

<sup>a</sup> Reference to Table 6-67<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.**Table B-6. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer New building architectural Design Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	39% vs. 53%	$\chi^2 = 7.10$ , $p = .01$
NY Upstate vs. NY Downstate	52% vs. 33%	$\chi^2 = 10.48$ , $p < .001$
NY Architects/Engineers vs. NY Contractors	59% vs. 15%	$\chi^2 = 49.20$ , $p < .001$
NY Architects/Engineers vs. NY EE Consultants	59% vs. 20%	$\chi^2 = 27.92$ , $p < .001$
NY Contractors vs. NY EE Consultants	15% vs. 20%	$\chi^2 = .65$ , $p = .42$
PA Architects/Engineers vs. PA Contractors	67% vs. 24%	$\chi^2 = 16.33$ , $p < .001$
PA Architects/Engineers vs. PA EE Consultants	67% vs. 11%	$\chi^2 = 10.83$ , $p = .001^c$
PA Contractors vs. PA EE Consultants	24% vs. 11%	$\chi^2 = .70$ , $p = .40^c$
NY Architects/Engineers vs. PA Architects/Engineers	59% vs. 67%	$\chi^2 = 1.75$ , $p = .19$
NY EE Consultants vs. PA EE Consultants	20% vs. 11%	$\chi^2 = .38$ , $p = .54^c$
NY Contractors vs. PA Contractors	15% vs. 24%	$\chi^2 = 1.40$ , $p = .24$

<sup>a</sup> Reference to Table 6-67<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-7. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Retrofit architectural design Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	43% vs. 50%	$\chi^2 = 1.43$ , $p = .23$
NY Upstate vs. NY Downstate	52% vs. 39%	$\chi^2 = 5.29$ , $p = .02$
NY Architects/Engineers vs. NY Contractors	63% vs. 17%	$\chi^2 = 51.10$ , $p < .001$
NY Architects/Engineers vs. NY EE Consultants	63% vs. 26%	$\chi^2 = 24.47$ , $p < .001$
NY Contractors vs. NY EE Consultants	17% vs. 26%	$\chi^2 = 1.82$ , $p = .18$
PA Architects/Engineers vs. PA Contractors	64% vs. 14%	$\chi^2 = 22.12$ , $p < .001$
PA Architects/Engineers vs. PA EE Consultants	64% vs. 22%	$\chi^2 = 5.97$ , $p = .02^c$
PA Contractors vs. PA EE Consultants	14% vs. 22%	$\chi^2 = .37$ , $p = .55^c$
NY Architects/Engineers vs. PA Architects/Engineers	63% vs. 64%	$\chi^2 = .04$ , $p = .84$
NY EE Consultants vs. PA EE Consultants	26% vs. 22%	$\chi^2 = .07$ , $p = .80^c$
NY Contractors vs. PA Contractors	17% vs. 14%	$\chi^2 = .19$ , $p = .67^c$

<sup>a</sup> Reference to Table 6-67<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.**Table B-8. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Project oversight Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	73% vs. 80%	$\chi^2 = 1.84$ , $p = .18$
NY Upstate vs. NY Downstate	81% vs. 70%	$\chi^2 = 4.46$ , $p = .04$
NY Architects/Engineers vs. NY Contractors	71% vs. 77%	$\chi^2 = 1.15$ , $p = .28$
NY Architects/Engineers vs. NY EE Consultants	71% vs. 73%	$\chi^2 = .09$ , $p = .77$
NY Contractors vs. NY EE Consultants	77% vs. 73%	$\chi^2 = .33$ , $p = .56$
PA Architects/Engineers vs. PA Contractors	78% vs. 93%	$\chi^2 = 3.50$ , $p = .06$
PA Architects/Engineers vs. PA EE Consultants	78% vs. 56%	$\chi^2 = 2.13$ , $p = .14^c$
PA Contractors vs. PA EE Consultants	93% vs. 56%	$\chi^2 = 7.28$ , $p = .01^c$
NY Architects/Engineers vs. PA Architects/Engineers	71% vs. 78%	$\chi^2 = 1.16$ , $p = .28$
NY EE Consultants vs. PA EE Consultants	73% vs. 56%	$\chi^2 = 1.20$ , $p = .27^c$
NY Contractors vs. PA Contractors	77% vs. 93%	$\chi^2 = 3.55$ , $p = .06$

<sup>a</sup> Reference to Table 6-67<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-9. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer New Building Engineering Design Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	40% vs. 46%	$\chi^2 = 1.80$ , $p = .18$
NY Upstate vs. NY Downstate	43% vs. 38%	$\chi^2 = .92$ , $p = .34$
NY Architects/Engineers vs. NY Contractors	55% vs. 12%	$\chi^2 = 48.91$ , $p < .001$
NY Architects/Engineers vs. NY EE Consultants	55% vs. 37%	$\chi^2 = 5.87$ , $p = .02$
NY Contractors vs. NY EE Consultants	12% vs. 37%	$\chi^2 = 14.40$ , $p < .001$
PA Architects/Engineers vs. PA Contractors	56% vs. 24%	$\chi^2 = 8.99$ , $p < .001$
PA Architects/Engineers vs. PA EE Consultants	56% vs. 22%	$\chi^2 = 3.78$ , $p = .05^c$
PA Contractors vs. PA EE Consultants	24% vs. 22%	$\chi^2 = .01$ , $p = .91^c$
NY Architects/Engineers vs. PA Architects/Engineers	55% vs. 56%	$\chi^2 = .04$ , $p = .84$
NY EE Consultants vs. PA EE Consultants	37% vs. 22%	$\chi^2 = .76$ , $p = .38^c$
NY Contractors vs. PA Contractors	12% vs. 24%	$\chi^2 = 2.82$ , $p = .09^c$

<sup>a</sup> Reference to Table 6-67<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.**Table B-10. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Retrofit Engineering Design Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	43% vs. 39%	$\chi^2 = .44$ , $p = .51$
NY Upstate vs. NY Downstate	45% vs. 42%	$\chi^2 = .35$ , $p = .56$
NY Architects/Engineers vs. NY Contractors	56% vs. 12%	$\chi^2 = 50.97$ , $p < .001$
NY Architects/Engineers vs. NY EE Consultants	56% vs. 50%	$\chi^2 = .74$ , $p = .39$
NY Contractors vs. NY EE Consultants	12% vs. 50%	$\chi^2 = 27.85$ , $p < .001$
PA Architects/Engineers vs. PA Contractors	46% vs. 28%	$\chi^2 = 3.08$ , $p = .08$
PA Architects/Engineers vs. PA EE Consultants	46% vs. 11%	$\chi^2 = 4.08$ , $p = .04^c$
PA Contractors vs. PA EE Consultants	28% vs. 11%	$\chi^2 = 1.03$ , $p = .31^c$
NY Architects/Engineers vs. PA Architects/Engineers	56% vs. 46%	$\chi^2 = 2.51$ , $p = .11$
NY EE Consultants vs. PA EE Consultants	50% vs. 11%	$\chi^2 = 4.80$ , $p = .03^c$
NY Contractors vs. PA Contractors	12% vs. 28%	$\chi^2 = 4.28$ , $p = .04^c$

<sup>a</sup> Reference to Table 6-67<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-11. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Retro Commissioning Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	25% vs. 20%	$\chi^2 = 1.30$ , $p = .25$
NY Upstate vs. NY Downstate	22% vs. 26%	$\chi^2 = .76$ , $p = 0.38$
NY Architects/Engineers vs. NY Contractors	24% vs. 13%	$\chi^2 = 4.63$ , $p = .03$
NY Architects/Engineers vs. NY EE Consultants	24% vs. 45%	$\chi^2 = 9.12$ , $p < .001$
NY Contractors vs. NY EE Consultants	13% vs. 45%	$\chi^2 = 19.44$ , $p < .001$
PA Architects/Engineers vs. PA Contractors	23% vs. 7%	$\chi^2 = 3.58$ , $p = .06$
PA Architects/Engineers vs. PA EE Consultants	23% vs. 33%	$\chi^2 = .51$ , $p = .48$
PA Contractors vs. PA EE Consultants	7% vs. 33%	$\chi^2 = 4.20$ , $p = .04^c$
NY Architects/Engineers vs. PA Architects/Engineers	24% vs. 23%	$\chi^2 = .08$ , $p = .78$
NY EE Consultants vs. PA EE Consultants	45% vs. 33%	$\chi^2 = .43$ , $p = .51^c$
NY Contractors vs. PA Contractors	13% vs. 7%	$\chi^2 = .81$ , $p = .37^c$

<sup>a</sup> Reference to Table 6-67

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-12. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Building or System Energy Audits Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	29% vs. 24%	$\chi^2 = 1.44$ , $p = .23$
NY Upstate vs. NY Downstate	31% vs. 28%	$\chi^2 = .23$ , $p = 0.63$
NY Architects/Engineers vs. NY Contractors	27% vs. 15%	$\chi^2 = 5.59$ , $p = .02$
NY Architects/Engineers vs. NY EE Consultants	27% vs. 57%	$\chi^2 = 18.20$ , $p < .001$
NY Contractors vs. NY EE Consultants	15% vs. 57%	$\chi^2 = 31.35$ , $p < .001$
PA Architects/Engineers vs. PA Contractors	24% vs. 10%	$\chi^2 = 2.37$ , $p = .12$
PA Architects/Engineers vs. PA EE Consultants	24% vs. 67%	$\chi^2 = 7.60$ , $p = .01^c$
PA Contractors vs. PA EE Consultants	10% vs. 67%	$\chi^2 = 12.10$ , $p < .001^c$
NY Architects/Engineers vs. PA Architects/Engineers	27% vs. 24%	$\chi^2 = .43$ , $p = .51$
NY EE Consultants vs. PA EE Consultants	57% vs. 67%	$\chi^2 = .28$ , $p = .60^c$
NY Contractors vs. PA Contractors	15% vs. 10%	$\chi^2 = .36$ , $p = .55^c$

<sup>a</sup> Reference to Table 6-67

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-13. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer LEED Building Design Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	34% vs. 43%	$\chi^2 = 3.83$ , $p = .05$
NY Upstate vs. NY Downstate	35% vs. 33%	$\chi^2 = 0.19$ , $p = .66$
NY Architects/Engineers vs. NY Contractors	46% vs. 11%	$\chi^2 = 34.60$ , $p < .001$
NY Architects/Engineers vs. NY EE Consultants	46% vs. 33%	$\chi^2 = 3.10$ , $p = .08$
NY Contractors vs. NY EE Consultants	11% vs. 33%	$\chi^2 = 11.85$ , $p = .001$
PA Architects/Engineers vs. PA Contractors	54% vs. 17%	$\chi^2 = 11.90$ , $p < .001$
PA Architects/Engineers vs. PA EE Consultants	54% vs. 22%	$\chi^2 = 3.29$ , $p = 0.07^c$
PA Contractors vs. PA EE Consultants	17% vs. 22%	$\chi^2 = .11$ , $p = 0.74^c$
NY Architects/Engineers vs. PA Architects/Engineers	46% vs. 54%	$\chi^2 = 1.65$ , $p = 0.20$
NY EE Consultants vs. PA EE Consultants	33% vs. 22%	$\chi^2 = .41$ , $p = 0.52^c$
NY Contractors vs. PA Contractors	11% vs. 17%	$\chi^2 = .94$ , $p = 0.33^c$

<sup>a</sup> Reference to Table 6-67

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-14. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Whole Building Energy Modeling Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	26% vs. 28%	$\chi^2 = .21$ , $p = .65$
NY Upstate vs. NY Downstate	29% vs. 25%	$\chi^2 = .68$ , $p = .41$
NY Architects/Engineers vs. NY Contractors	30% vs. 11%	$\chi^2 = 12.71$ , $p < .001$
NY Architects/Engineers vs. NY EE Consultants	30% vs. 41%	$\chi^2 = 2.75$ , $p = .10$
NY Contractors vs. NY EE Consultants	11% vs. 41%	$\chi^2 = 19.80$ , $p < .001$
PA Architects/Engineers vs. PA Contractors	29% vs. 17%	$\chi^2 = 1.62$ , $p = .20$
PA Architects/Engineers vs. PA EE Consultants	29% vs. 56%	$\chi^2 = 2.62$ , $p = 0.11^c$
PA Contractors vs. PA EE Consultants	17% vs. 56%	$\chi^2 = 5.20$ , $p = .02^c$
NY Architects/Engineers vs. PA Architects/Engineers	30% vs. 29%	$\chi^2 = .00$ , $p = .96$
NY EE Consultants vs. PA EE Consultants	41% vs. 56%	$\chi^2 = .68$ , $p = .41^c$
NY Contractors vs. PA Contractors	11% vs. 17%	$\chi^2 = .94$ , $p = .33^c$

<sup>a</sup> Reference to Table 6-67

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-15. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer Installation of Equipment Services in the MF Sector<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	32% vs. 21%	$\chi^2 = 5.49$ , $p = .02$
NY Upstate vs. NY Downstate	28% vs. 34%	$\chi^2 = 1.47$ , $p = .22$
NY Architects/Engineers vs. NY Contractors	13% vs. 63%	$\chi^2 = 75.59$ , $p < .001$
NY Architects/Engineers vs. NY EE Consultants	13% vs. 45%	$\chi^2 = 30.10$ , $p < .001$
NY Contractors vs. NY EE Consultants	63% vs. 45%	$\chi^2 = 4.69$ , $p = .03$
PA Architects/Engineers vs. PA Contractors	8% vs. 66%	$\chi^2 = 42.32$ , $p < .001$
PA Architects/Engineers vs. PA EE Consultants	8% vs. 11%	$\chi^2 = .11$ , $p = .74^c$
PA Contractors vs. PA EE Consultants	66% vs. 11%	$\chi^2 = 8.15$ , $p = .004^c$
NY Architects/Engineers vs. PA Architects/Engineers	13% vs. 8%	$\chi^2 = 1.32$ , $p = .25$
NY EE Consultants vs. PA EE Consultants	45% vs. 11%	$\chi^2 = 3.77$ , $p = .05^c$
NY Contractors vs. PA Contractors	63% vs. 66%	$\chi^2 = .07$ , $p = .79$

<sup>a</sup> Reference to Table 6-67

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-16. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Have Done a Multifamily New Construction Project in the Past 2 years<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	62% vs. 61%	$\chi^2 = .01$ , $p = .93$
NY Upstate vs. NY Downstate	69% vs. 58%	$\chi^2 = 3.92$ , $p = .05$
NY Upstate Architects/Engineers vs. NY Downstate Architects/Engineers	75% vs. 61%	$\chi^2 = 3.70$ , $p = .05$
NY Upstate Contractors vs. NY Downstate Contractors	75% vs. 57%	$\chi^2 = 2.80$ , $p = .09$
NY Upstate EE Consultants vs. NY Downstate EE Consultants	39% vs. 52%	$\chi^2 = .92$ , $p = .34$
NY Architects/Engineers vs. NY Contractors	66% vs. 62%	$\chi^2 = .49$ , $p = .49$
NY Architects/Engineers vs. NY EE Consultants	66% vs. 48%	$\chi^2 = 6.31$ , $p = .01$
NY Contractors vs. NY EE Consultants	62% vs. 48%	$\chi^2 = 2.88$ , $p = .09$
PA Architects/Engineers vs. PA Contractors	66% vs. 59%	$\chi^2 = .56$ , $p = .45$
PA Architects/Engineers vs. PA EE Consultants	66% vs. 22%	$\chi^2 = 6.75$ , $p = .009^c$
PA Contractors vs. PA EE Consultants	59% vs. 22%	$\chi^2 = 3.64$ , $p = .06^c$
NY Architects/Engineers vs. PA Architects/Engineers	66% vs. 66%	$\chi^2 = .00$ , $p = .99$
NY EE Consultants vs. PA EE Consultants	48% vs. 22%	$\chi^2 = 2.17$ , $p = .14^c$
NY Contractors vs. PA Contractors	62% vs. 59%	$\chi^2 = .11$ , $p = .74$

<sup>a</sup> Reference to Table 6-9

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-17. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend New Construction Measures that Exceed Energy Code in Lighting<sup>a</sup>**

Comparison Groups	Percentage Increased <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	28% vs. 24%	$\chi^2 = .41$ , $p = .52$
NY Upstate vs. NY Downstate	37% vs. 23%	$\chi^2 = 3.85$ , $p = .05$
NY Architects/Engineers vs. NY Contractors	30% vs. 20%	$\chi^2 = 1.46$ , $p = .23$
NY Architects/Engineers vs. NY EE Consultants	30% vs. 37%	$\chi^2 = .55$ , $p = .46$
NY Contractors vs. NY EE Consultants	20% vs. 37%	$\chi^2 = 2.48$ , $p = .12$
PA Architects/Engineers vs. PA Contractors	21% vs. 25%	$\chi^2 = .09$ , $p = .76^{c*}$
PA Architects/Engineers vs. PA EE Consultants	21% vs. 100%	$\chi^2 = 6.51$ , $p = .01^{c*}$
PA Contractors vs. PA EE Consultants	25% vs. 100%	$\chi^2 = 4.50$ , $p = .03^{c*}$
NY Architects/Engineers vs. PA Architects/Engineers	30% vs. 21%	$\chi^2 = 1.26$ , $p = .26$
NY EE Consultants vs. PA EE Consultants	37% vs. 100%	$\chi^2 = 3.04$ , $p = .08^{c*}$
NY Contractors vs. PA Contractors	20% vs. 25%	$\chi^2 = .15$ , $p = .70^{c*}$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-18. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend New Construction Measures that Exceed Energy Code in Heating<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	33% vs. 26%	$\chi^2 = 1.11$ , $p = .29$
NY Upstate vs. NY Downstate	34% vs. 32%	$\chi^2 = .05$ , $p = .82$
NY Architects/Engineers vs. NY Contractors	36% vs. 25%	$\chi^2 = 1.87$ , $p = .17$
NY Architects/Engineers vs. NY EE Consultants	36% vs. 37%	$\chi^2 = .02$ , $p = .88$
NY Contractors vs. NY EE Consultants	25% vs. 37%	$\chi^2 = 1.33$ , $p = .25$
PA Architects/Engineers vs. PA Contractors	29% vs. 13%	$\chi^2 = 1.45$ , $p = .23^c$
PA Architects/Engineers vs. PA EE Consultants	29% vs. 50%	$\chi^2 = .42$ , $p = .51^c$
PA Contractors vs. PA EE Consultants	13% vs. 50%	$\chi^2 = 1.63$ , $p = .20^c$
NY Architects/Engineers vs. PA Architects/Engineers	36% vs. 29%	$\chi^2 = .80$ , $p = .37$
NY EE Consultants vs. PA EE Consultants	37% vs. 50%	$\chi^2 = .13$ , $p = .72^c$
NY Contractors vs. PA Contractors	25% vs. 13%	$\chi^2 = .84$ , $p = .36^c$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-19. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend New Construction Measures that Exceed Energy Code in Cooling<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	32% vs. 23%	$\chi^2 = 2.25$ , $p = .13$
NY Upstate vs. NY Downstate	35% vs. 31%	$\chi^2 = .41$ , $p = .52$
NY Architects/Engineers vs. NY Contractors	36% vs. 25%	$\chi^2 = 1.98$ , $p = .16$
NY Architects/Engineers vs. NY EE Consultants	36% vs. 33%	$\chi^2 = .06$ , $p = .81$
NY Contractors vs. NY EE Consultants	25% vs. 33%	$\chi^2 = .68$ , $p = .41$
PA Architects/Engineers vs. PA Contractors	23% vs. 19%	$\chi^2 = .14$ , $p = .71^c$
PA Architects/Engineers vs. PA EE Consultants	23% vs. 50%	$\chi^2 = .76$ , $p = .38^c$
PA Contractors vs. PA EE Consultants	19% vs. 50%	$\chi^2 = 1.00$ , $p = .32^c$
NY Architects/Engineers vs. PA Architects/Engineers	36% vs. 23%	$\chi^2 = 2.71$ , $p = .10$
NY EE Consultants vs. PA EE Consultants	33% vs. 50%	$\chi^2 = .23$ , $p = .63^c$
NY Contractors vs. PA Contractors	25% vs. 19%	$\chi^2 = .22$ , $p = .67^c$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-20. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend New Construction Measures that Exceed Energy Code in Water Heating<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	32% vs. 19%	$\chi^2 = 3.92$ , $p = .06$
NY Upstate vs. NY Downstate	34% vs. 30%	$\chi^2 = .28$ , $p = .60$
NY Architects/Engineers vs. NY Contractors	32% vs. 25%	$\chi^2 = .79$ , $p = .37$
NY Architects/Engineers vs. NY EE Consultants	32% vs. 41%	$\chi^2 = .72$ , $p = .40$
NY Contractors vs. NY EE Consultants	25% vs. 41%	$\chi^2 = 2.01$ , $p = .16$
PA Architects/Engineers vs. PA Contractors	22% vs. 6%	$\chi^2 = 2.31$ , $p = .13^c$
PA Architects/Engineers vs. PA EE Consultants	22% vs. 50%	$\chi^2 = .84$ , $p = .36^c$
PA Contractors vs. PA EE Consultants	6% vs. 50%	$\chi^2 = 3.70$ , $p = .05^c$
NY Architects/Engineers vs. PA Architects/Engineers	32% vs. 22%	$\chi^2 = 1.70$ , $p = .19$
NY EE Consultants vs. PA EE Consultants	41% vs. 50%	$\chi^2 = .07$ , $p = .80^c$
NY Contractors vs. PA Contractors	25% vs. 6%	$\chi^2 = 2.87$ , $p = .09^c$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.



**Table B-21. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend New Construction Measures that Exceed Energy Code in Insulation<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	38% vs. 32%	$\chi^2 = .75$ , $p = .39$
NY Upstate vs. NY Downstate	42% vs. 36%	$\chi^2 = .69$ , $p = .41$
NY Architects/Engineers vs. NY Contractors	43% vs. 33%	$\chi^2 = 1.24$ , $p = .27$
NY Architects/Engineers vs. NY EE Consultants	43% vs. 30%	$\chi^2 = 1.51$ , $p = .22$
NY Contractors vs. NY EE Consultants	33% vs. 30%	$\chi^2 = .11$ , $p = .74$
PA Architects/Engineers vs. PA Contractors	34% vs. 25%	$\chi^2 = .46$ , $p = .50$
PA Architects/Engineers vs. PA EE Consultants	34% vs. 50%	$\chi^2 = .22$ , $p = .64^c$
PA Contractors vs. PA EE Consultants	25% vs. 50%	$\chi^2 = .55$ , $p = .46^c$
NY Architects/Engineers vs. PA Architects/Engineers	43% vs. 34%	$\chi^2 = 1.16$ , $p = .28$
NY EE Consultants vs. PA EE Consultants	30% vs. 50%	$\chi^2 = .36$ , $p = .55^c$
NY Contractors vs. PA Contractors	33% vs. 25%	$\chi^2 = .39$ , $p = .53$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-22. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend New Construction Measures that Exceed Energy Code in Lighting, Heating, Cooling, Water Heating and Insulation<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	18% vs. 12%	$\chi^2 = 1.34$ , $p = .25$
NY Upstate vs. NY Downstate	22% vs. 15%	$\chi^2 = 1.31$ , $p = .25$
NY Architects/Engineers vs. NY Contractors	19% vs. 16%	$\chi^2 = .27$ , $p = .61$
NY Architects/Engineers vs. NY EE Consultants	19% vs. 15%	$\chi^2 = .31$ , $p = .58^c$
NY Contractors vs. NY EE Consultants	16% vs. 15%	$\chi^2 = .02$ , $p = .89^c$
PA Architects/Engineers vs. PA Contractors	13% vs. 50%	$\chi^2 = .59$ , $p = .44^c$
PA Architects/Engineers vs. PA EE Consultants	13% vs. 6%	$\chi^2 = 2.28$ , $p = .13^c$
PA Contractors vs. PA EE Consultants	6% vs. 50%	$\chi^2 = 3.70$ , $p = .05^c$
NY Architects/Engineers vs. PA Architects/Engineers	19% vs. 13%	$\chi^2 = 1.25$ , $p = .26$
NY EE Consultants vs. PA EE Consultants	15% vs. 50%	$\chi^2 = 1.62$ , $p = .20^c$
NY Contractors vs. PA Contractors	16% vs. 6%	$\chi^2 = 1.12$ , $p = .31^c$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-23. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend Model Energy Savings<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	11% vs. 9%	$\chi^2 = .18$ , $p = .67$
NY Upstate vs. NY Downstate	11% vs. 11%	$\chi^2 = .02$ , $p = .88$
NY Architects/Engineers vs. NY Contractors	5% vs. 19%	$\chi^2 = 8.11$ , $p = .004^c$
NY Architects/Engineers vs. NY EE Consultants	5% vs. 23%	$\chi^2 = 9.46$ , $p = .002^c$
NY Contractors vs. NY EE Consultants	19% vs. 23%	$\chi^2 = .20$ , $p = .66$
PA Architects/Engineers vs. PA Contractors	7% vs. 19%	$\chi^2 = 2.06$ , $p = .15^c$
PA Architects/Engineers vs. PA EE Consultants	7% vs. 0%	$\chi^2 = .15$ , $p = .70^c$
PA Contractors vs. PA EE Consultants	19% vs. 0%	$\chi^2 = .45$ , $p = .50^c$
NY Architects/Engineers vs. PA Architects/Engineers	5% vs. 7%	$\chi^2 = .38$ , $p = .54^c$
NY EE Consultants vs. PA EE Consultants	23% vs. 0%	$\chi^2 = .59$ , $p = .44^c$
NY Contractors vs. PA Contractors	19% vs. 19%	$\chi^2 = .00$ , $p = 1.0^c$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-24. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Recommend New Construction Measures that Exceed Energy Code in Lighting, Heating, Cooling, Water Heating, and Insulation, and Who Always Model Energy Savings<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	4% vs. 3%	$\chi^2 = .41$ , $p = .52^c$
NY Upstate vs. NY Downstate	7% vs. 3%	$\chi^2 = 2.20$ , $p = .14^c$
NY Architects/Engineers vs. NY Contractors	0% vs. 10%	$\chi^2 = 10.93$ , $p = .001^c$
NY Architects/Engineers vs. NY EE Consultants	0% vs. 11%	$\chi^2 = 12.27$ , $p < .001^c$
NY Contractors vs. NY EE Consultants	10% vs. 11%	$\chi^2 = .03$ , $p = .86^c$
PA Architects/Engineers vs. PA Contractors	4% vs. 0%	$\chi^2 = .61$ , $p = .43^c$
PA Architects/Engineers vs. PA EE Consultants	4% vs. 0%	$\chi^2 = .07$ , $p = .79^c$
PA Contractors vs. PA EE Consultants	0% vs. 0%	N/A
NY Architects/Engineers vs. PA Architects/Engineers	0% vs. 4%	$\chi^2 = 3.84$ , $p = .05^c$
NY EE Consultants vs. PA EE Consultants	11% vs. 0%	$\chi^2 = .25$ , $p = .62^c$
NY Contractors vs. PA Contractors	10% vs. 0%	$\chi^2 = 1.80$ , $p = .18^c$

<sup>a</sup> Reference to Table 6-10, Table 6-11, Table 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-25. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Indicated that Owners Always Adopt Recommendations<sup>a</sup>**

Comparison Groups	Accepts Recommendations that Exceed Energy Code		Accepts Recommendations from Model	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	21% vs. 23%	$\chi^2 = .10$ , p=.75	24% vs. 33%	$\chi^2 = .83$ , p=.36
NY Upstate vs. NY Downstate	14% vs. 25%	$\chi^2 = 2.81$ , p=.09	29% vs. 22%	$\chi^2 = .42$ , p=.52
NY Architects/Engineers vs. NY Contractors	23% vs. 17%	$\chi^2 = .59$ , p=.44	20% vs. 36%	$\chi^2 = 2.21$ , p=.14
NY Architects/Engineers vs. NY EE Consultants	23% vs. 22%	$\chi^2 = .01$ , p=.90	20% vs. 17%	$\chi^2 = .05$ , p=.83
NY Contractors vs. NY EE Consultants	17% vs. 22%	$\chi^2 = .21$ , p=.65 <sup>c</sup>	36% vs. 17%	$\chi^2 = 1.45$ , p=.23 <sup>c</sup>
PA Architects/Engineers vs. PA Contractors	23% vs. 20%	$\chi^2 = .04$ , p=.85 <sup>c</sup>	35% vs. 33%	$\chi^2 = .01$ , p=.94 <sup>c</sup>
PA Architects/Engineers vs. PA EE Consultants	23% vs. 50%	$\chi^2 = .78$ , p=.38 <sup>c</sup>	35% vs. 17%	$\chi^2 = .53$ , p=.47 <sup>c</sup>
PA Contractors vs. PA EE Consultants	20% vs. 50%	$\chi^2 = .80$ , p=.37 <sup>c</sup>	33% vs. 0%	$\chi^2 = .47$ , p=.50 <sup>c</sup>
NY Architects/Engineers vs. PA Architects/Engineers	23% vs. 23%	$\chi^2 = .01$ , p=.97 <sup>c</sup>	20% vs. 35%	$\chi^2 = 1.74$ , p=.19 <sup>c</sup>
NY EE Consultants vs. PA EE Consultants	22% vs. 50%	$\chi^2 = .81$ , p=.37 <sup>c</sup>	17% vs. 0%	$\chi^2 = .20$ , p=.66 <sup>c</sup>
NY Contractors vs. PA Contractors	17% vs. 20%	$\chi^2 = .05$ , p=.83 <sup>c</sup>	36% vs. 33%	$\chi^2 = .02$ , p=.90 <sup>c</sup>

<sup>a</sup> Reference to Figure 6-3, Figure 6-4<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.**Table B-26. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Make Recommendations on New Construction Projects more Frequently (Versus the Same or Less Frequently Compared to Five Years Ago)<sup>a</sup>**

Comparison Groups	Make Recommendations More Frequently		Model Energy Usage More Frequently	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	51% vs. 49%	$\chi^2 = 2.63$ , p=.37 <sup>c</sup>	61% vs. 64%	$\chi^2 = .17$ , p=.92
NY Upstate vs. NY Downstate	44% vs. 55%	$\chi^2 = 3.50$ , p=.17 <sup>c</sup>	70% vs. 55%	$\chi^2 = 2.09$ , p=.35 <sup>c</sup>
NY Architects/Engineers vs. NY Contractors	44% vs. 58%	$\chi^2 = 6.99$ , p=.03 <sup>c</sup>	50% vs. 77%	$\chi^2 = 4.35$ , p=.11 <sup>c</sup>
NY Architects/Engineers vs. NY EE Consultants	44% vs. 65%	$\chi^2 = 2.87$ , p=.09 <sup>c</sup>	50% vs. 64%	$\chi^2 = .80$ , p=.67 <sup>c</sup>
NY Contractors vs. NY EE Consultants	58% vs. 65%	$\chi^2 = 1.15$ , p=.56 <sup>c</sup>	77% vs. 64%	$\chi^2 = .72$ , p=.70 <sup>c</sup>
PA Architects/Engineers vs. PA Contractors	52% vs. 44%	$\chi^2 = .66$ , p=.72 <sup>c</sup>	63% vs. 80%	$\chi^2 = .76$ , p=.69 <sup>c</sup>
continued				

Comparison Groups	Make Recommendations More Frequently		Model Energy Usage More Frequently	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
PA Architects/Engineers vs. PA EE Consultants	52% vs. 0%	$\chi^2 = 2.49$ , $p = .29^c$	63% vs. 0%	$\chi^2 = 2.46$ , $p = .29^c$
PA Contractors vs. PA EE Consultants	44% vs. 0%	$\chi^2 = 2.04$ , $p = .36^c$	80% vs. 0%	$\chi^2 = 2.40$ , $p = .12^c$
NY Architects/Engineers vs. PA Architects/Engineers	44% vs. 52%	$\chi^2 = 5.08$ , $p = .08^c$	50% vs. 63%	$\chi^2 = 1.36$ , $p = .51^c$
NY EE Consultants vs. PA EE Consultants	65% vs. 0%	$\chi^2 = 3.18$ , $p = .08^c$	64% vs. 0%	$\chi^2 = 2.18$ , $p = .34^c$
NY Contractors vs. PA Contractors	58% vs. 44%	$\chi^2 = .77$ , $p = .68^c$	77% vs. 80%	$\chi^2 = .24$ , $p = .89^c$

<sup>a</sup> Reference to Figure 6-6, Figure 6-7

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-27. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Have Done a Multifamily Existing Building Project in the Past 2 years<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	62% vs. 55%	$\chi^2 = 1.80$ , $p = .18$
NY Upstate vs. NY Downstate	65% vs. 61%	$\chi^2 = .60$ , $p = .44$
NY Architects/Engineers vs. NY Contractors	63% vs. 60%	$\chi^2 = 1.91$ , $p = .17$
NY Architects/Engineers vs. NY EE Consultants	63% vs. 71%	$\chi^2 = 1.34$ , $p = .25$
NY Contractors vs. NY EE Consultants	60% vs. 71%	$\chi^2 = 4.40$ , $p = .04$
Downstate Architects/Engineers vs. Upstate Architects/Engineers	64% vs. 62%	$\chi^2 = .07$ , $p = .79$
Downstate Contractors vs. Upstate Contractors	47% vs. 71%	$\chi^2 = 4.70$ , $p = .03$
Downstate EE Consultants vs. Upstate EE Consultants	73% vs. 67%	$\chi^2 = .23$ , $p = .63$
PA Architects/Engineers vs. PA Contractors	55% vs. 55%	$\chi^2 = .00$ , $p = .91$
PA Architects/Engineers vs. PA EE Consultants	55% vs. 56%	$\chi^2 = .00$ , $p = .98^c$
PA Contractors vs. PA EE Consultants	55% vs. 56%	$\chi^2 = .00$ , $p = .98^c$
NY Architects/Engineers vs. PA Architects/Engineers	63% vs. 55%	$\chi^2 = 1.52$ , $p = .22$
NY EE Consultants vs. PA EE Consultants	71% vs. 56%	$\chi^2 = .87$ , $p = .35^c$
NY Contractors vs. PA Contractors	60% vs. 55%	$\chi^2 = .01$ , $p = .93$

<sup>a</sup> Reference to Table 6-13

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-28. Results from Chi-Square Test Comparing the Percentage of Market Actors Involved in a MF Existing Building Project in the Past Two Years Who Ever Provide an Energy Audit (rarely, sometimes, often or always)<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	62% vs. 61%	$\chi^2 = .05$ , $p = .83$
NY Upstate vs. NY Downstate	68% vs. 59%	$\chi^2 = 1.55$ , $p = .21$
NY Architects/Engineers vs. NY Contractors	50% vs. 79%	$\chi^2 = 11.55$ , $p = .001$
NY Architects/Engineers vs. NY EE Consultants	50% vs. 75%	$\chi^2 = 7.85$ , $p = .005$
NY Contractors vs. NY EE Consultants	79% vs. 75%	$\chi^2 = .23$ , $p = .63$
PA Architects/Engineers vs. PA Contractors	51% vs. 80%	$\chi^2 = 3.95$ , $p = .05$
PA Architects/Engineers vs. PA EE Consultants	51% vs. 100%	$\chi^2 = 4.41$ , $p = .04^c$
PA Contractors vs. PA EE Consultants	80% vs. 100%	$\chi^2 = 1.18$ , $p = .28^c$
NY Architects/Engineers vs. PA Architects/Engineers	50% vs. 51%	$\chi^2 = .01$ , $p = .95$
NY EE Consultants vs. PA EE Consultants	75% vs. 100%	$\chi^2 = 1.61$ , $p = .20^c$
NY Contractors vs. PA Contractors	79% vs. 75%	$\chi^2 = .01$ , $p = .95^c$

<sup>a</sup> Reference to Table 6-14<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.**Table B-29. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Address Lighting Measures during Audits<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	49% vs. 44%	$\chi^2 = .30$ , $p = .58$
NY Upstate vs. NY Downstate	53% vs. 46%	$\chi^2 = .58$ , $p = .45$
NY Architects/Engineers vs. NY Contractors	47% vs. 43%	$\chi^2 = .15$ , $p = .70$
NY Architects/Engineers vs. NY EE Consultants	47% vs. 58%	$\chi^2 = .87$ , $p = .35$
NY Contractors vs. NY EE Consultants	43% vs. 58%	$\chi^2 = 1.43$ , $p = .23$
PA Architects/Engineers vs. PA Contractors	50% vs. 17%	$\chi^2 = 3.74$ , $p = .05^c$
PA Architects/Engineers vs. PA EE Consultants	50% vs. 80%	$\chi^2 = 1.51$ , $p = .22^c$
PA Contractors vs. PA EE Consultants	17% vs. 80%	$\chi^2 = 6.20$ , $p = .01^c$
NY Architects/Engineers vs. PA Architects/Engineers	47% vs. 50%	$\chi^2 = .05$ , $p = .83$
NY EE Consultants vs. PA EE Consultants	58% vs. 80%	$\chi^2 = .91$ , $p = .34^c$
NY Contractors vs. PA Contractors	43% vs. 17%	$\chi^2 = 2.75$ , $p = .10^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-30. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Address Heating Measures during Audits<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	52% vs. 42%	$\chi^2 = 1.27$ , $p = .26$
NY Upstate vs. NY Downstate	51% vs. 52%	$\chi^2 = .01$ , $p = .92$
NY Architects/Engineers vs. NY Contractors	59% vs. 35%	$\chi^2 = 4.98$ , $p = .03$
NY Architects/Engineers vs. NY EE Consultants	59% vs. 58%	$\chi^2 = .01$ , $p = .92$
NY Contractors vs. NY EE Consultants	35% vs. 58%	$\chi^2 = 3.54$ , $p = .06$
PA Architects/Engineers vs. PA Contractors	50% vs. 17%	$\chi^2 = 3.74$ , $p = .05^c$
PA Architects/Engineers vs. PA EE Consultants	50% vs. 60%	$\chi^2 = .17$ , $p = .68^c$
PA Contractors vs. PA EE Consultants	17% vs. 60%	$\chi^2 = 3.19$ , $p = .07^c$
NY Architects/Engineers vs. PA Architects/Engineers	59% vs. 50%	$\chi^2 = .51$ , $p = .47$
NY EE Consultants vs. PA EE Consultants	58% vs. 60%	$\chi^2 = .01$ , $p = .92^c$
NY Contractors vs. PA Contractors	35% vs. 17%	$\chi^2 = 1.46$ , $p = .23^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-31. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Address Cooling Measures during Audits<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	41% vs. 39%	$\chi^2 = .03$ , $p = .87$
NY Upstate vs. NY Downstate	37% vs. 43%	$\chi^2 = .47$ , $p = .50$
NY Architects/Engineers vs. NY Contractors	49% vs. 22%	$\chi^2 = 6.73$ , $p = .009$
NY Architects/Engineers vs. NY EE Consultants	49% vs. 46%	$\chi^2 = .11$ , $p = .74$
NY Contractors vs. NY EE Consultants	22% vs. 46%	$\chi^2 = 4.18$ , $p = .04$
PA Architects/Engineers vs. PA Contractors	46% vs. 17%	$\chi^2 = 2.95$ , $p = .09$
PA Architects/Engineers vs. PA EE Consultants	46% vs. 60%	$\chi^2 = .33$ , $p = .56^c$
PA Contractors vs. PA EE Consultants	17% vs. 60%	$\chi^2 = 3.19$ , $p = .07^c$
NY Architects/Engineers vs. PA Architects/Engineers	49% vs. 46%	$\chi^2 = .07$ , $p = .79$
NY EE Consultants vs. PA EE Consultants	46% vs. 60%	$\chi^2 = .39$ , $p = .54^c$
NY Contractors vs. PA Contractors	22% vs. 17%	$\chi^2 = .17$ , $p = .69^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-32. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Address Heating Measures during Audits<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	45% vs. 34%	$\chi^2 = 1.58, p = .21$
NY Upstate vs. NY Downstate	41% vs. 48%	$\chi^2 = .65, p = .42$
NY Architects/Engineers vs. NY Contractors	50% vs. 38%	$\chi^2 = 1.35, p = .25$
NY Architects/Engineers vs. NY EE Consultants	50% vs. 46%	$\chi^2 = .17, p = .68$
NY Contractors vs. NY EE Consultants	38% vs. 46%	$\chi^2 = .42, p = .52$
PA Architects/Engineers vs. PA Contractors	38% vs. 17%	$\chi^2 = 1.64, p = .20^c$
PA Architects/Engineers vs. PA EE Consultants	38% vs. 60%	$\chi^2 = .86, p = .35^c$
PA Contractors vs. PA EE Consultants	17% vs. 60%	$\chi^2 = 3.19, p = .07^c$
NY Architects/Engineers vs. PA Architects/Engineers	50% vs. 38%	$\chi^2 = 1.07, p = .30$
NY EE Consultants vs. PA EE Consultants	46% vs. 60%	$\chi^2 = .37, p = .54^c$
NY Contractors vs. PA Contractors	38% vs. 17%	$\chi^2 = 1.85, p = .17^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-33. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Address Insulation Measures during Audits<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	52% vs. 34%	$\chi^2 = 3.78, p = .05$
NY Upstate vs. NY Downstate	55% vs. 49%	$\chi^2 = .40, p = .53$
NY Architects/Engineers vs. NY Contractors	59% vs. 51%	$\chi^2 = .48, p = .49$
NY Architects/Engineers vs. NY EE Consultants	59% vs. 39%	$\chi^2 = 3.11, p = .08$
NY Contractors vs. NY EE Consultants	51% vs. 39%	$\chi^2 = 1.01, p = .32$
PA Architects/Engineers vs. PA Contractors	38% vs. 17%	$\chi^2 = 1.64, p = .20^c$
PA Architects/Engineers vs. PA EE Consultants	38% vs. 60%	$\chi^2 = .86, p = .35^c$
PA Contractors vs. PA EE Consultants	17% vs. 60%	$\chi^2 = 3.19, p = .07^c$
NY Architects/Engineers vs. PA Architects/Engineers	59% vs. 38%	$\chi^2 = 3.04, p = .08$
NY EE Consultants vs. PA EE Consultants	39% vs. 60%	$\chi^2 = .76, p = .38^c$
NY Contractors vs. PA Contractors	51% vs. 17%	$\chi^2 = 4.45, p = .04^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-34. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Address All Measures during Audits<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	23% vs. 24%	$\chi^2 = .04$ , $p = .84$
NY Upstate vs. NY Downstate	25% vs. 22%	$\chi^2 = .12$ , $p = .73$
NY Architects/Engineers vs. NY Contractors	26% vs. 16%	$\chi^2 = 1.32$ , $p = .25$
NY Architects/Engineers vs. NY EE Consultants	26% vs. 24%	$\chi^2 = .05$ , $p = .83$
NY Contractors vs. NY EE Consultants	16% vs. 24%	$\chi^2 = .70$ , $p = .40$
PA Architects/Engineers vs. PA Contractors	25% vs. 8%	$\chi^2 = 1.42$ , $p = .23^c$
PA Architects/Engineers vs. PA EE Consultants	25% vs. 60%	$\chi^2 = 2.37$ , $p = .12^c$
PA Contractors vs. PA EE Consultants	8% vs. 60%	$\chi^2 = 5.24$ , $p = .02^c$
NY Architects/Engineers vs. PA Architects/Engineers	26% vs. 25%	$\chi^2 = .02$ , $p = .90$
NY EE Consultants vs. PA EE Consultants	24% vs. 60%	$\chi^2 = 2.70$ , $p = .10^c$
NY Contractors vs. PA Contractors	16% vs. 8%	$\chi^2 = .46$ , $p = .50^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-35. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Estimate Energy Savings Costs on Existing Building Projects<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	40% vs. 47%	$\chi^2 = .74$ , $p = .39$
NY Upstate vs. NY Downstate	40% vs. 39%	$\chi^2 = .03$ , $p = .87$
NY Architects/Engineers vs. NY Contractors	24% vs. 42%	$\chi^2 = 3.3$ , $p = .07$
NY Architects/Engineers vs. NY EE Consultants	24% vs. 64%	$\chi^2 = 13.86$ , $p < .001$
NY Contractors vs. NY EE Consultants	42% vs. 64%	$\chi^2 = 2.98$ , $p = .08$
PA Architects/Engineers vs. PA Contractors	40% vs. 50%	$\chi^2 = .25$ , $p = .62^c$
PA Architects/Engineers vs. PA EE Consultants	40% vs. 80%	$\chi^2 = 2.68$ , $p = .10^c$
PA Contractors vs. PA EE Consultants	50% vs. 80%	$\chi^2 = 1.17$ , $p = .28^c$
NY Architects/Engineers vs. PA Architects/Engineers	24% vs. 40%	$\chi^2 = 2.14$ , $p = .14$
NY EE Consultants vs. PA EE Consultants	64% vs. 80%	$\chi^2 = .52$ , $p = .47^c$
NY Contractors vs. PA Contractors	42% vs. 50%	$\chi^2 = .15$ , $p = .70^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.



**Table B-36. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Estimate Installed Costs on Existing Building Projects<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	37% vs. 39%	$\chi^2 = .02$ , $p = .90$
NY Upstate vs. NY Downstate	38% vs. 44%	$\chi^2 = 1.38$ , $p = .24$
NY Architects/Engineers vs. NY Contractors	29% vs. 29%	$\chi^2 = .01$ , $p = .94$
NY Architects/Engineers vs. NY EE Consultants	29% vs. 61%	$\chi^2 = 8.54$ , $p = .003$
NY Contractors vs. NY EE Consultants	29% vs. 61%	$\chi^2 = 7.07$ , $p = .008$
PA Architects/Engineers vs. PA Contractors	32% vs. 33%	$\chi^2 = .01$ , $p = .94^c$
PA Architects/Engineers vs. PA EE Consultants	32% vs. 80%	$\chi^2 = 4.00$ , $p = .05^c$
PA Contractors vs. PA EE Consultants	33% vs. 80%	$\chi^2 = 2.80$ , $p = .09^c$
NY Architects/Engineers vs. PA Architects/Engineers	29% vs. 32%	$\chi^2 = .06$ , $p = .81$
NY EE Consultants vs. PA EE Consultants	61% vs. 80%	$\chi^2 = .70$ , $p = .40^c$
NY Contractors vs. PA Contractors	29% vs. 33%	$\chi^2 = .08$ , $p = .78^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-37. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Provide Modeled Energy Savings on Existing Building Projects<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	19% vs. 15%	$\chi^2 = .33$ , $p = .57$
NY Upstate vs. NY Downstate	21% vs. 17%	$\chi^2 = .37$ , $p = .54$
NY Architects/Engineers vs. NY Contractors	9% vs. 27%	$\chi^2 = 5.29$ , $p = .02$
NY Architects/Engineers vs. NY EE Consultants	9% vs. 28%	$\chi^2 = 5.97$ , $p = .02^c$
NY Contractors vs. NY EE Consultants	27% vs. 28%	$\chi^2 = .02$ , $p = .88$
PA Architects/Engineers vs. PA Contractors	12% vs. 9%	$\chi^2 = .07$ , $p = .80^c$
PA Architects/Engineers vs. PA EE Consultants	12% vs. 40%	$\chi^2 = 2.35$ , $p = .13^c$
PA Contractors vs. PA EE Consultants	9% vs. 40%	$\chi^2 = 2.16$ , $p = .14^c$
NY Architects/Engineers vs. PA Architects/Engineers	9% vs. 12%	$\chi^2 = .23$ , $p = .63^c$
NY EE Consultants vs. PA EE Consultants	28% vs. 40%	$\chi^2 = .29$ , $p = .59^c$
NY Contractors vs. PA Contractors	27% vs. 9%	$\chi^2 = 1.45$ , $p = .23^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-38. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Provide Owner with a Written Report for Existing Building Projects<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	39% vs. 39%	$\chi^2 = .002$ , $p = .96$
NY Upstate vs. NY Downstate	40% vs. 39%	$\chi^2 = .02$ , $p = .90$
NY Architects/Engineers vs. NY Contractors	22% vs. 40%	$\chi^2 = 3.28$ , $p = .07$
NY Architects/Engineers vs. NY EE Consultants	22% vs. 67%	$\chi^2 = 17.40$ , $p < .001$
NY Contractors vs. NY EE Consultants	40% vs. 67%	$\chi^2 = 4.85$ , $p = .03$
PA Architects/Engineers vs. PA Contractors	44% vs. 22%	$\chi^2 = 1.33$ , $p = .25^c$
PA Architects/Engineers vs. PA EE Consultants	44% vs. 40%	$\chi^2 = .03$ , $p = .87^c$
PA Contractors vs. PA EE Consultants	22% vs. 40%	$\chi^2 = .50$ , $p = .48^c$
NY Architects/Engineers vs. PA Architects/Engineers	22% vs. 44%	$\chi^2 = 3.96$ , $p = .05$
NY EE Consultants vs. PA EE Consultants	67% vs. 40%	$\chi^2 = 1.33$ , $p = .25^c$
NY Contractors vs. PA Contractors	40% vs. 22%	$\chi^2 = .98$ , $p = .32^c$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-39. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Perform All Modeling Related Activities on Existing Building Projects<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	11% vs. 12%	$\chi^2 = .03$ , $p = .86^{c*}$
NY Upstate vs. NY Downstate	17% vs. 8%	$\chi^2 = 2.34$ , $p = .13$
NY Architects/Engineers vs. NY Contractors	0% vs. 17%	$\chi^2 = 10.63$ , $p = .001^{c*}$
NY Architects/Engineers vs. NY EE Consultants	0% vs. 25%	$\chi^2 = 15.92$ , $p < .001^{c*}$
NY Contractors vs. NY EE Consultants	17% vs. 25%	$\chi^2 = .62$ , $p = .43$
PA Architects/Engineers vs. PA Contractors	8% vs. 9%	$\chi^2 = .01$ , $p = .91^{c*}$
PA Architects/Engineers vs. PA EE Consultants	8% vs. 40%	$\chi^2 = 3.69$ , $p = .06^{c*}$
PA Contractors vs. PA EE Consultants	9% vs. 40%	$\chi^2 = 2.16$ , $p = .14^{c*}$
NY Architects/Engineers vs. PA Architects/Engineers	0% vs. 8%	$\chi^2 = 4.76$ , $p = .03^{c*}$
NY EE Consultants vs. PA EE Consultants	25% vs. 40%	$\chi^2 = .49$ , $p = .48^{c*}$
NY Contractors vs. PA Contractors	17% vs. 9%	$\chi^2 = .42$ , $p = .52^{c*}$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-40. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Always Address all Measures during Audits and Also Always Estimate Energy Savings Costs on Existing Building Projects<sup>a</sup>**

Comparison Groups	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	6% vs. 12%	$\chi^2 = 1.43$ , $p = .23^{c*}$
NY Upstate vs. NY Downstate	8% vs. 5%	$\chi^2 = .50$ , $p = .48^{c*}$
NY Architects/Engineers vs. NY Contractors	0% vs. 8%	$\chi^2 = 4.86$ , $p = .03^{c*}$
NY Architects/Engineers vs. NY EE Consultants	0% vs. 15%	$\chi^2 = 9.30$ , $p = .002^{c*}$
NY Contractors vs. NY EE Consultants	8% vs. 15%	$\chi^2 = .86$ , $p = .36^{c*}$
PA Architects/Engineers vs. PA Contractors	8% vs. 8%	$\chi^2 = .00$ , $p = .97^{c*}$
PA Architects/Engineers vs. PA EE Consultants	8% vs. 40%	$\chi^2 = 3.69$ , $p = .06^{c*}$
PA Contractors vs. PA EE Consultants	8% vs. 40%	$\chi^2 = 2.44$ , $p = .12^{c*}$
NY Architects/Engineers vs. PA Architects/Engineers	0% vs. 8%	$\chi^2 = 4.76$ , $p = .03^{c*}$
NY EE Consultants vs. PA EE Consultants	15% vs. 40%	$\chi^2 = 1.78$ , $p = .18^{c*}$
NY Contractors vs. PA Contractors	8% vs. 8%	$\chi^2 = .00$ , $p = .98^{c*}$

<sup>a</sup> Reference to Table 6-15, Table 6-16, Table 6-17

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-41. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Indicated that Owners Always Accept Recommendations<sup>a</sup>**

Comparison Groups	Estimated Cost Recommendations		Model Recommendations	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	20% vs. 24%	$\chi^2 = .29$ , $p = .59$	14% vs. 16%	$\chi^2 = .07$ , $p = .79^c$
NY Upstate vs. NY Downstate	22% vs. 19%	$\chi^2 = .12$ , $p = .74$	19% vs. 11%	$\chi^2 = 1.17$ , $p = .28$
NY Architects/Engineers vs. NY Contractors	16% vs. 27%	$\chi^2 = 1.33$ , $p = .35$	10% vs. 26%	$\chi^2 = 3.27$ , $p = .07$
NY Architects/Engineers vs. NY EE Consultants	16% vs. 20%	$\chi^2 = .18$ , $p = .67$	10% vs. 5%	$\chi^2 = .40$ , $p = .53^c$
NY Contractors vs. NY EE Consultants	27% vs. 20%	$\chi^2 = .37$ , $p = .54$	26% vs. 5%	$\chi^2 = 3.62$ , $p = .06^c$
PA Architects/Engineers vs. PA Contractors	21% vs. 38%	$\chi^2 = .89$ , $p = .35^c$	14% vs. 14%	$\chi^2 = .00$ , $p = 1.0^c$
PA Architects/Engineers vs. PA EE Consultants	21% vs. 20%	$\chi^2 = .00$ , $p = .97^c$	14% vs. 33%	$\chi^2 = .69$ , $p = .41^c$
PA Contractors vs. PA EE Consultants	38% vs. 20%	$\chi^2 = .44$ , $p = .51^c$	14% vs. 33%	$\chi^2 = .48$ , $p = .49^c$
NY Architects/Engineers vs. PA Architects/Engineers	16% vs. 21%	$\chi^2 = .23$ , $p = .63^c$	10% vs. 14%	$\chi^2 = .28$ , $p = .59^c$
NY EE Consultants vs. PA EE Consultants	20% vs. 20%	$\chi^2 = .00$ , $p = 1.0^c$	5% vs. 33%	$\chi^2 = 2.64$ , $p = .10^c$
NY Contractors vs. PA Contractors	27% vs. 38%	$\chi^2 = .39$ , $p = .53^c$	26% vs. 13%	$\chi^2 = .42$ , $p = .52^c$

<sup>a</sup> Reference to Figure 6-9, Figure 6-10

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-42. Results from Chi-Square Test Comparing the Percentage of Market Actors Who Conduct Audits and Model Energy Usage on Existing Building Projects more Frequently (Versus the Same or Less Frequently Compared to Five Years Ago)<sup>a</sup>**

Comparison Groups	Conduct Audits More Frequently		Model Energy Usage More Frequently	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	46% vs. 31%	$\chi^2 = 2.98, p = .23$	50% vs. 45%	$\chi^2 = .41, p = .82^c$
NY Upstate vs. NY Downstate	37% vs. 51%	$\chi^2 = 2.59, p = .27^c$	47% vs. 52%	$\chi^2 = 3.73, p = .16^c$
NY Architects/Engineers vs. NY Contractors	40% vs. 40%	$\chi^2 = 1.70, p = .43^c$	58% vs. 43%	$\chi^2 = 1.73, p = .42^c$
NY Architects/Engineers vs. NY EE Consultants	40% vs. 62%	$\chi^2 = 4.60, p = .10^c$	58% vs. 44%	$\chi^2 = .87, p = .65^c$
NY Contractors vs. NY EE Consultants	40% vs. 62%	$\chi^2 = 5.55, p = .06^c$	43% vs. 44%	$\chi^2 = .13, p = .94^c$
PA Architects/Engineers vs. PA Contractors	36% vs. 11%	$\chi^2 = 2.29, p = .32^c$	50% vs. 38%	$\chi^2 = .36, p = .55^c$
PA Architects/Engineers vs. PA EE Consultants	36% vs. 40%	$\chi^2 = .22, p = .90^c$	50% vs. 33%	$\chi^2 = 6.97, p = .03^c$
PA Contractors vs. PA EE Consultants	11% vs. 40%	$\chi^2 = 1.95, p = .38^c$	38% vs. 33%	$\chi^2 = 3.02, p = .22^c$
NY Architects/Engineers vs. PA Architects/Engineers	40% vs. 36%	$\chi^2 = .24, p = .89^c$	58% vs. 50%	$\chi^2 = 1.64, p = .44^c$
NY EE Consultants vs. PA EE Consultants	62% vs. 40%	$\chi^2 = .86, p = .35^c$	44% vs. 33%	$\chi^2 = 2.31, p = .32^c$
NY Contractors vs. PA Contractors	40% vs. 11%	$\chi^2 = 3.00, p = .22^c$	43% vs. 38%	$\chi^2 = .42, p = .81^c$

<sup>a</sup> Reference to Figure 6-11, Figure 6-12

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-43. Results from Chi-Square Test Comparing the Percentage of Market Actors Who are Aware of New York Incentive Programs<sup>a</sup>**

Comparison Groups	Utility Programs		NYSERDA Home Performance	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY Upstate vs. NY Downstate	66% vs. 58%	$\chi^2 = 2.06, p = .15$	84% vs. 67%	$\chi^2 = 10.70, p < .001$
NY Architects/Engineers vs. NY Contractors	59% vs. 47%	$\chi^2 = 3.43, p = .06$	77% vs. 57%	$\chi^2 = 11.79, p < .001$
NY Architects/Engineers vs. NY EE Consultants	59% vs. 84%	$\chi^2 = 12.63, p < .001$	77% vs. 82%	$\chi^2 = .66, p = .42$
NY Contractors vs. NY EE Consultants	47% vs. 84%	$\chi^2 = 21.17, < .001$	57% vs. 82%	$\chi^2 = 10.45, p = .001$

<sup>a</sup> Reference to Table 6-18, Table 6-19

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-44. Results from Chi-Square Test Comparing the Percentage of Market Actors Who are Aware of New York Incentive Programs<sup>a</sup>**

Comparison Groups	NYSERDA New Construction		NYSERDA MPP	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY Upstate vs. NY Downstate	75% vs. 57%	$\chi^2 = 10.76$ , $p < .001$	63% vs. 50%	$\chi^2 = 5.07$ , $p = .02$
NY Architects/Engineers vs. NY Contractors	66% vs. 50%	$\chi^2 = 6.59$ , $p = .01$	53% vs. 45%	$\chi^2 = 1.75$ , $p = .19$
NY Architects/Engineers vs. NY EE Consultants	66% vs. 73%	$\chi^2 = .93$ , $p = .33$	53% vs. 74%	$\chi^2 = 8.06$ , $p = .005$
NY Contractors vs. NY EE Consultants	50% vs. 73%	$\chi^2 = 7.87$ , $p = .005$	45% vs. 74%	$\chi^2 = 12.71$ , $p < .001$

<sup>a</sup> Reference to Table 6-18, Table 6-19

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-45. Results from Chi-Square Test Comparing the Percentage of Market Actors Who are Aware of Pennsylvania Incentive Programs<sup>a</sup>**

Comparison Groups	Utility Programs		Government Programs	
	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>	Percentages <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
PA Architects/Engineers vs. PA Contractors	56% vs. 52%	$\chi^2 = .14$ , $p = .71$	50% vs. 48%	$\chi^2 = .03$ , $p < .87$
PA Architects/Engineers vs. PA EE Consultants	56% vs. 78%	$\chi^2 = 1.63$ , $p = .20^c$	50% vs. 67%	$\chi^2 = .91$ , $p = .34^c$
PA Contractors vs. PA EE Consultants	52% vs. 78%	$\chi^2 = 1.91$ , $p = .17^c$	48% vs. 67%	$\chi^2 = .93$ , $p = .33^c$

<sup>a</sup> Reference to Table 6-21

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-46. Results from Chi-Square Test Comparing the Percentage of Market Actors that offer MF services by Market Actors who have participated in an MPP supported project and those that have not<sup>a</sup>**

Comparison Groups	Percentages (Participated in MPP vs. Have Not Participated in MPP)	Test Statistic (p-value) <sup>b</sup>
Installation of equipment	39% vs. 24%	$\chi^2 = 3.78$ , $p = .05$
New building construction	76% vs. 61%	$\chi^2 = 4.20$ , $p = .04$
Project oversight	83% vs. 70%	$\chi^2 = 2.98$ , $p = .08$
Whole building energy modeling	36% vs. 29%	$\chi^2 = .88$ , $p = .35$
Retro commissioning services	36% vs. 30%	$\chi^2 = .65$ , $p = .42$
continued		

Comparison Groups	Percentages (Participated in MPP vs. Have Not Participated in MPP)	Test Statistic (p-value) <sup>b</sup>
LEED building design	40% vs. 37%	$\chi^2 = .09$ , $p = .76$
Building or system energy audits	40% vs. 38%	$\chi^2 = .08$ , $p = .78$
Renovation/remodeling	76% vs. 75%	$\chi^2 = .00$ , $p = .96$
New building engineering design	40% vs. 41%	$\chi^2 = .01$ , $p = .93$
Retrofit engineering design	47% vs. 50%	$\chi^2 = .18$ , $p = .67$
New building architectural design	36% vs. 44%	$\chi^2 = .98$ , $p = .35$

<sup>a</sup> Reference to Table 6-23

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

**Table B-47. Results from Chi-Square Test Comparing the Percentage of Market Actors that Have Witnessed an Increase in Employee Engagement in EE Work in the past Five Years (versus no Change or Decreased)<sup>a</sup>**

Comparison Groups	Percentage Increased <sup>b</sup>	Test Statistic (p-value) <sup>b</sup>
NY vs. PA	<b>26% vs. 20%</b>	<b><math>\chi^2 = 16.67</math>, <math>p &lt; .001</math></b>
NY Upstate vs. NY Downstate	21% vs. 28%	$\chi^2 = 4.11$ , $p = .13$
NY Architects/Engineers vs. NY Contractors	23% vs. 24%	$\chi^2 = .65$ , $p = .72$
NY Architects/Engineers vs. NY EE Consultants	23% vs. 38%	$\chi^2 = 4.45$ , $p = .11$
NY Contractors vs. NY EE Consultants	24% vs. 38%	$\chi^2 = 2.94$ , $p = .23^c$
PA Architects/Engineers vs. PA Contractors	21% vs. 15%	$\chi^2 = .68$ , $p = .71^c$
PA Architects/Engineers vs. PA EE Consultants	21% vs. 25%	$\chi^2 = 1.86$ , $p = .39^c$
PA Contractors vs. PA EE Consultants	15% vs. 25%	$\chi^2 = 1.58$ , $p = .45^c$
NY Architects/Engineers vs. PA Architects/Engineers	<b>23% vs. 21%</b>	<b><math>\chi^2 = 10.86</math>, <math>p = .004</math></b>
NY EE Consultants vs. PA EE Consultants	38% vs. 25%	$\chi^2 = .97$ , $p = .62^c$
NY Contractors vs. PA Contractors	<b>24% vs. 15%</b>	<b><math>\chi^2 = 5.27</math>, <math>p = .07</math></b>

<sup>a</sup> Reference to Table 6-15

<sup>b</sup> Those who answered 'Don't Know' or refused to answer were excluded from this percentage calculation as well as the Chi-square Test.

<sup>c</sup> Chi-square results may be invalid due to low expected cell count.

## Appendix C. Participant Statistical Analysis

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### Analyses on Partner Experience Variable

Because the Partner experience variable is significantly skewed by the Predominant Partner, the PE/MCA team determined that it was inappropriate to use a continuous measure of Partner experience in the analyses. Three dichotomous variables were created to examine the effect of Partner experience overall and the effect of whether the participant worked with the Predominant Partner: 1) low/moderate experience (25 projects or fewer) versus high experience (26 or more projects); 2) low/moderate experience versus high experience, excluding the Predominant Partner; and 3) Predominant Partner versus other Partner. As shown in Table C-1, most effects that are significant when comparing the responses of participants who worked with the Predominant Partner to those of participants who worked with another Partner are not significant when examining the effects of low/moderate versus high experience, suggesting that it was the Predominant Partner who drove differences in participants' experiences. However, there are two effects that are significant when comparing low/moderate to high experience that are not significant when comparing the Predominant Partner to other partners: 1) motivation to participate in MPP to reduce energy use and 2) satisfaction with the program's ability to maximize energy savings potential at their property.

**Table C-1. Test Statistics Across Partner Experience Variable Options**

Effect	Predominant vs. Other Partner	Low /Moderate vs. High Experience	Low /Moderate vs. High Experience Without Predominant Partner
Prior knowledge about how to reduce energy use	<b>Mann-Whitney U = 464, <math>p = .06</math></b>	Mann-Whitney U = 2467, $p = .27$	Mann-Whitney U = 157, $p = .62$
Pursued LEED certification prior to MPP participation	$\chi^2 = 4.29, p = .04$	$\chi^2 = 1.35, p = .25$	$\chi^2 = .38, p = .54$
Motivated by financial factors	$\chi^2 = 4.68, p = .03$	$\chi^2 = .21, p = .65$	$\chi^2 = .04, p = .83$
Motivated to reduce energy use	$\chi^2 = .05, p = .82$	<b><math>\chi^2 = 3.18, p = .07</math></b>	<b><math>\chi^2 = 3.69, p = .06</math></b>
Motivated by Partner and Partner services	$\chi^2 = 2.72, p = .10$	$\chi^2 = 2.07, p = .15$	$\chi^2 = .86, p = .36$
Received financing for project	<b><math>\chi^2 = 16.9, p &lt; .001</math></b>	$\chi^2 = 2.62, p = .11$	$\chi^2 = .17, p = .68$
Additional financing required for recommended upgrades	<b><math>\chi^2 = 11.6, p = .001</math></b>	$\chi^2 = .56, p = .45$	$\chi^2 = .03, p = .85$
Used tax credits to finance project	<b><math>\chi^2 = 8.46, p = .004</math></b>	$\chi^2 = 4.52, p = .03^a$	$\chi^2 = 1.82, p = .18$
Used grant/subsidy to finance project	<b><math>\chi^2 = 4.81, p = .03</math></b>	$\chi^2 = .26, p = .61$	$\chi^2 = .07, p = .79$
Used city funds to finance project	<b><math>\chi^2 = 4.77, p = .03</math></b>	$\chi^2 = .04, p = .84$	$\chi^2 = .99, p = .32$
Likelihood of seeking training for building operators	<b><math>\chi^2 = 5.36, p = .07</math></b>	$\chi^2 = .64, p = .73$	$\chi^2 = .07, p = .97$
Program requirements have slowed pace of the project	<b><math>\chi^2 = 11.3, p = .001</math></b>	$\chi^2 = 2.32, p = .13$	$\chi^2 = .32, p = .57$
Satisfaction with Partner's explanation of program steps	<b>Mann-Whitney U = 1510, <math>p = .06</math></b>	Mann-Whitney U = 728, $p = .69$	Mann-Whitney U = 427, $p = .39$
Satisfaction with technical assistance provided by Partner	<b>Mann-Whitney U = 1578, <math>p = .009</math></b>	Mann-Whitney U = 691, $p = .82$	Mann-Whitney U = 371, $p = .61$
Satisfaction with energy savings potential maximization	Mann-Whitney U = 1041, $p = .88$	<b>Mann-Whitney U = 416, <math>p = .08</math></b>	<b>Mann-Whitney U = 246, <math>p = .05</math></b>

<sup>a</sup> The effect is not statistically reliable due to the small number of cases in one cell of the comparison.



## Participant Interview Chapter Statistical Tests

Significant effects are presented in bold font.

**Table C-2. Differences across Comparison Variables**

Effect	Statistics
Building type by market type	$\chi^2 = 15.9, p < .001, \lambda = .15$
Building type by region	$\chi^2 = 10.6, p < .001, \lambda = .10$
Building type by first time working with MPP	$\chi^2 = 5.48, p = .02, \lambda = .05$
Building type by has one property in NYS	$\chi^2 = 10.4, p < .001, \lambda = .10$
Building type by worked with Predominant Partner	$\chi^2 = 50.5, p < .001, \lambda = .47$
Project number of units by building type	<b>Mann-Whitney U = 1879, p = .005</b>
Market type by region	$\chi^2 = 7.30, p = .007, \lambda = .07$
Market type by units leased or owned	$\chi^2 = 47.4, p < .001, \lambda = .70$
Market type by first time working with MPP	$\chi^2 = 3.44, p = .06, \lambda = .03$
Market type by has one NYS property	$\chi^2 = 23.0, p < .001, \lambda = .21$
Market type by worked with Predominant Partner	$\chi^2 = 12.0, p < .001, \lambda = .11$
Project number of units by market type	<b>Mann-Whitney U = 1274, p = .09</b>
Region by units leased or owned	$\chi^2 = 11.4, p = .001, \lambda = .17$
Region by first time working with MPP	$\chi^2 = 4.0, p = .05, \lambda = .04$
Region by worked with Predominant Partner	$\chi^2 = 18.0, p < .001, \lambda = .16$
Project number of units by region	<b>Mann-Whitney U = 852, p = .01</b>
Units leased or owned by has one NYS property	$\chi^2 = 9.90, p = .002, \lambda = .15$
First time working with MPP by has one NYS property	$\chi^2 = 24.4, p < .001, \lambda = .23$
Has one NYS property by worked with Predominant Partner	$\chi^2 = 12.3, p < .001, \lambda = .11$

<sup>a</sup>  $\lambda$  (lambda) < .20 weak relationship,  $.20 \geq \lambda < .40$  moderate relationship,  $\lambda \geq .40$  strong relationship

**Table C-3. Comparisons between Interview Sample and Eligible Population**

Effect	Statistics
Building type by source	$\chi^2 = 1.49, p = .22$
Market type by source	$\chi^2 = 2.04, p = .15$
Region by source	$\chi^2 = 3.47, p = .06, \lambda = .01$
Units leased or owned by source	$\chi^2 = .19, p = .67$
Project number of units by source	Mann-Whitney U = 27501, p = .59

<sup>a</sup>  $\lambda$  (lambda)  $\leq .20$  weak relationship

**Table C-4. Statistical Tests for Participant Interview Chapter Energy Efficiency Measure Comparisons**

Effect	Statistics
Pursued LEED certification by first time working with MPP	$\chi^2 = 4.53, p = .03$
Pursued LEED certification by worked with Predominant Partner	$\chi^2 = 4.29, p = .04$

**Table C-5. Pre-MPP Knowledge Self-Ratings**

Effect	Statistics
Knowledge self-rating by building type	Mann-Whitney U = 849, $p = .01$
Knowledge self-rating by region	Mann-Whitney U = 794, $p = .02$
Knowledge self-rating by worked with Predominant Partner	Mann-Whitney U = 464, $p = .06$
Knowledge self-rating by received a pre-MPP comprehensive energy audit	Mann-Whitney U = 250, $p = .02$

**Table C-6. Inclination toward Energy Efficiency Measures**

Effect	Statistics
Inclination toward energy efficiency measures by building type	Mann-Whitney U = 909, $p = .005$
Inclination toward energy efficiency measures by market type	Mann-Whitney U = 527, $p = .09$

**Table C-7. Pre-Participation Energy Efficiency Measures Considered**

Effect	Statistics
Heating and cooling: Boilers by building type	$\chi^2 = 8.17, p = .004$
Building envelope: Windows by building type	$\chi^2 = 5.15, p = .02$
Building envelope: Windows by region	$\chi^2 = 4.07, p = .04$

**Table C-8. Importance of Reasons for Upgrading Property**

Effect	Statistics
Importance of lowering utility costs for tenants by units leased or owned	Mann-Whitney U = 455, $p = .01$
Importance of lowering utility costs for tenants by has one NYS Property	Mann-Whitney U = 849, $p = .08$
Importance of lowering utility costs for tenants by market type	Mann-Whitney U = 1117, $p = .56$

**Table C-9. Reasons for Participating in MPP**

Effect	Statistics
Financial reasons by building type	$\chi^2 = 6.12, p = .01$
Incentives by building type	$\chi^2 = 3.37, p = .07$
Program structure/ease of participation by building type	$\chi^2 = 5.27, p = .02$
Required to implement efficiency measures by building type	$\chi^2 = 3.20, p = .07$
Incentives by worked with Predominant Partner	$\chi^2 = 4.68, p = .03$
Reducing energy use by worked with Predominant Partner	$\chi^2 = 2.72, p = .10$
Partner and associated services by units leased or owned	$\chi^2 = 5.14, p = .02$

**Table C-10. How Respondent Connected with Partner**

Effect	Statistics
Preexisting relationship with Partner by first time working with MPP	$\chi^2 = 10.4, p = .001$
Preexisting relationship with Partner by has one NYS property	$\chi^2 = 7.58, p = .006$

**Table C-11. Received Financing and Required Additional Financing to Cover Costs of Recommended Measures**

Effect	Statistics
Received financing by building type	$\chi^2 = 29.9, p < .001$
Required additional financing by building type	$\chi^2 = 10.1, p < .02$
Received financing by region	$\chi^2 = 9.80, p = .002$
Required additional financing by region	$\chi^2 = 5.85, p = .02$
Received financing by market type	$\chi^2 = 11.5, p < .001$
Required additional financing by first time working with MPP	$\chi^2 = 3.33, p = .07$
Required additional financing by has one NYS property	$\chi^2 = 3.12, p = .08$
Received financing by worked with Predominant Partner	$\chi^2 = 16.9, p < .001$
Required additional financing by worked with Predominant Partner	$\chi^2 = 11.6, p = .001$

**Table C-12. Types of Financing Considered**

Effect	Statistics
Tax credits by building type	$\chi^2 = 7.99, p = .005$
Tax credits by first time working with MPP	$\chi^2 = 9.71, p = .003$
Tax credits by firm has one NYS property	$\chi^2 = 5.91, p = .02$
Tax credits by worked with Predominant Partner	$\chi^2 = 8.46, p = .004$
Loan by first time working with MPP	$\chi^2 = 5.16, p = .02$
Tax-exempt bonds by first time working with MPP	$\chi^2 = 8.59, p = .003$
Grant/subsidy by worked with Predominant Partner	$\chi^2 = 4.81, p = .03$

**Table C-13. Considered City Funds**

Effect	Statistics
Considered city funds by building type	$\chi^2 = 9.74, p = .002$
Considered city funds by region	$\chi^2 = 3.83, p = .05$
Considered city funds by firm has one NYS property	$\chi^2 = 5.36, p = .02$
Considered city funds by worked with Predominant Partner	$\chi^2 = 4.77, p = .03$

**Table C-14. Breadth of Recommendations Pursued**

Effect	Statistics
Breadth of recommendations pursued by first time working with MPP	$\chi^2 = 4.61, p = .03$
Project number of units by breadth of recommendations pursued	Mann-Whitney U = 1115, $p = .03$

**Table C-15. Likelihood of Seeking Training for Building Operators and Hiring Trained Building Technicians in the Future**

Effect	Statistics
Seek training for building operators by region	$\chi^2 = 6.92, p = .03$
Seek training for building operators by worked with Predominant Partner	$\chi^2 = 5.36, p = .07$
Hire trained building technician by building type	$\chi^2 = 5.22, p = .07$

**Table C-16. Inspection Revealed Issues**

Effect	Statistics
Building number of units by inspection revealed issues	Mann-Whitney U = 300, $p < .001$

**Table C-17. Partner/ERP Suggested Project Could Receive 20% Savings Bonus**

Effect	Statistics
Partner/ERP suggested Bonus by building type	$\chi^2 = 3.84, p = .05$
Partner/ERP suggested Bonus by market type	$\chi^2 = 4.15, p = .04$
Partner/ERP suggested Bonus by region	$\chi^2 = 14.3, p < .001$
Partner/ERP suggested Bonus by units leased or owned	$\chi^2 = 10.7, p = .001$

**Table C-18. Satisfaction with Program Elements**

Effect	Statistics
How Partner explained program steps by market type	Mann-Whitney U = 633, $p = .004$
How Partner explained program steps by units leased or owned	Mann-Whitney U = 330, $p = .05$
How Partner explained program steps by has one NYS property	Mann-Whitney U = 723, $p = .01$
How Partner explained program steps by worked with Predominant Partner	Mann-Whitney U = 1510, $p = .06$
Technical assistance provided by Partner by market type	Mann-Whitney U = 646, $p = .08$
Technical assistance provided by Partner by worked with Predominant Partner	Mann-Whitney U = 1578, $p = .009$
Allowing flexibility in project scoping by region	Mann-Whitney U = 1348, $p = .01$

**Table C-19. Program Requirements Slowed Pace of the Project**

Effect	Statistics
Requirements slowed project by building type	$\chi^2 = 3.52$ , $p = .06$
Requirements slowed project by market type	$\chi^2 = 3.81$ , $p = .05$
Requirements slowed project by region	$\chi^2 = 7.38$ , $p = .007$
Requirements slowed project by first time working with MPP	$\chi^2 = 6.76$ , $p = .009$
Requirements slowed project by has one NYS property	$\chi^2 = 8.28$ , $p = .004$
Requirements slowed project by worked with Predominant Partner	$\chi^2 = 11.3$ , $p = .001$



## Appendix D. Market Characterization County Level Tables

**Table D-1. Multifamily Property Information by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2013, March)

County	Total Assessed Value (\$1,000)	Total Living Area sq. ft.	Number of Buildings	Number of Properties	Number of Units
Albany	\$715,938	14,352,587	1,572	1,016	18,984
Allegany	\$20,306	612,905	107	82	846
Bronx	\$5,408,243	356,397,733	10,722	8,177	427,267
Brooklyn	\$10,323,886	481,944,162	28,298	24,797	400,784
Broome	\$126,207	8,052,278	946	721	7,918
Cattaraugus	\$39,429	975,038	319	271	1,149
Cayuga	\$51,434	941,617	143	104	1,773
Chautauqua	\$79,051	1,780,847	542	467	2,919
Chemung	\$69,454	1,611,512	219	166	2,404
Chenango	\$18,153	549,270	171	137	631
Clinton	\$131,482	2,556,644	389	242	3,425
Columbia	\$59,700	1,031,909	196	140	1,196
Cortland	\$50,272	1,147,906	211	146	1,938
Delaware	\$16,791	439,694	159	136	551
Dutchess	\$1,021,999	6,946,130	3,559	3,196	7,712
Erie	\$1,257,512	23,666,835	5,266	4,617	43,263
Essex	\$31,509	609,223	120	88	631
Franklin	\$18,043	522,702	114	94	711
Fulton	\$16,487	693,689	106	93	927
Genesee	\$39,103	941,874	118	89	1,469
Greene	\$69,332	1,676,579	753	626	1,131
Hamilton	\$2,316	27,945	13	10	25
Herkimer	\$28,781	1,160,127	132	112	1,378
Jefferson	\$235,703	2,484,109	423	261	4,601
Lewis	\$12,291	180,842	44	38	306
Livingston	\$59,346	1,289,964	209	127	1,795
Madison	\$34,895	844,406	161	129	1,369
Manhattan	\$60,072,033	800,392,722	25,240	22,081	857,332
Monroe	\$1,774,903	28,342,249	2,922	1,702	54,337
Continued					

County	Total Assessed Value (\$1,000)	Total Living Area sq. ft.	Number of Buildings	Number of Properties	Number of Units
Montgomery	\$11,587	798,353	150	106	787
Nassau	\$384,292	7,285,688	3,328	3,210	7,422
Niagara	\$194,515	5,256,274	1,049	845	8,704
Oneida	\$136,612	4,946,139	772	586	7,553
Onondaga	\$736,816	16,787,986	2,330	1,838	31,255
Ontario	\$201,007	2,440,882	509	382	4,343
Orange	\$270,787	3,881,822	1,334	1,177	6,410
Orleans	\$19,348	696,129	105	75	948
Oswego	\$69,541	1,791,350	307	219	2,776
Otsego	\$44,366	537,274	203	183	810
Putnam	\$74,381	730,896	273	225	985
Queens	\$8,607,584	315,210,319	23,983	10,743	365,606
Rensselaer	\$142,831	1,115,568	922	808	1,589
Rockland	\$830,788	7,718,785	7,199	6,937	10,946
Saratoga	\$542,835	6,956,792	812	473	10,892
Schenectady	\$274,436	4,592,552	509	384	6,932
Schoharie	\$25,659	698,313	132	80	719
Schuyler	\$5,504	110,002	26	20	130
Seneca	\$24,027	437,263	71	47	868
St. Lawrence	\$45,941	1,411,059	323	213	1,860
Staten Island	\$458,340	29,340,827	7,610	673	30,860
Steuben	\$59,393	1,282,306	228	144	2,145
Suffolk	\$322,374	414,147	5,765	5,711	0
Sullivan	\$91,030	2,073,830	1,086	921	2,859
Tioga	\$13,236	410,676	74	61	492
Tompkins	\$404,782	3,913,451	608	422	6,924
Ulster	\$301,124	3,983,006	970	579	6,320
Warren	\$103,019	2,116,336	293	158	2,499
Washington	\$47,711	678,798	142	98	1,267
Wayne	\$63,218	1,584,229	224	139	2,496
Westchester	\$1,122,666	62,363,873	25,275	25,081	62,424
Wyoming	\$15,544	425,231	76	56	666
Yates	\$9,533	212,451	49	32	278
<b>Total NYS</b>	<b>\$97,439,425</b>	<b>2,234,376,105</b>	<b>169,911</b>	<b>132,491</b>	<b>2,439,537</b>



**Table D-2. Multifamily Properties by Number-of-Stories Class by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	20+ Stories	Total
Albany	109	841	52	10	4	0	1,016
Allegany	7	73	1	0	1	0	82
Broome	28	677	11	4	1	0	721
Bronx	0	1,400	4,185	2,364	192	36	8,177
Brooklyn	0	8,794	13,873	1,843	223	64	24,797
Cattaraugus	146	124	0	1	0	0	271
Cayuga	1	97	3	1	2	0	104
Chautauqua	204	255	8	0	0	0	467
Chemung	2	162	0	2	0	0	166
Chenango	80	57	0	0	0	0	137
Clinton	2	233	2	4	1	0	242
Columbia	4	135	1	0	0	0	140
Cortland	5	138	3	0	0	0	146
Delaware	62	73	1	0	0	0	136
Dutchess	2,769	410	13	2	2	0	3,196
Erie	3,033	1,482	61	32	8	1	4,617
Essex	2	83	3	0	0	0	88
Franklin	3	89	1	1	0	0	94
Fulton	3	88	2	0	0	0	93
Genesee	4	84	0	1	0	0	89
Greene	431	193	1	0	1	0	626
Hamilton	2	8	0	0	0	0	10
Herkimer	5	101	3	3	0	0	112
Jefferson	53	200	5	3	0	0	261
Lewis	11	27	0	0	0	0	38
Livingston	12	114	0	0	0	1	127
Madison	15	113	1	0	0	0	129
Manhattan	1	1,212	12,175	6,102	1,940	651	22,081
Monroe	299	1,347	28	10	17	1	1,702
Montgomery	23	78	4	1	0	0	106
Nassau	3,001	162	12	34	0	1	3,210
Niagara	309	531	2	2	1	0	845
Continued							

County	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	20+ Stories	Total
Oneida	138	430	10	6	2	0	586
Onondaga	339	1,448	27	14	7	3	1,838
Ontario	197	179	3	1	1	1	382
Orange	838	328	10	1	0	0	1,177
Orleans	1	73	1	0	0	0	75
Oswego	53	162	4	0	0	0	219
Otsego	80	102	0	0	0	1	183
Putnam	150	70	1	0	1	3	225
Queens	0	6,192	2,463	1,897	166	25	10,743
Rensselaer	697	109	1	0	1	0	808
Rockland	6,541	379	7	10	0	0	6,937
Saratoga	10	459	3	1	0	0	473
Schenectady	5	366	12	1	0	0	384
Schoharie	12	68	0	0	0	0	80
Schuyler	10	10	0	0	0	0	20
Seneca	2	44	1	0	0	0	47
St Lawrence	25	186	0	0	1	1	213
Staten Island	0	562	36	70	5	0	673
Steuben	12	131	1	0	0	0	144
Suffolk	5,696	15	0	0	0	0	5,711
Sullivan	732	182	6	1	0	0	921
Tioga	1	60	0	0	0	0	61
Tompkins	12	384	21	5	0	0	422
Ulster	215	353	9	2	0	0	579
Warren	1	154	0	2	1	0	158
Washington	5	93	0	0	0	0	98
Wayne	8	130	1	0	0	0	139
Westchester	23,206	1,082	479	218	92	4	25,081
Wyoming	3	52	0	0	1	0	56
Yates	3	29	0	0	0	0	32
<b>Total NYS</b>	<b>49,618</b>	<b>33,213</b>	<b>33,547</b>	<b>12,649</b>	<b>2,671</b>	<b>793</b>	<b>132,491</b>

**Table D-3. Multifamily Properties by Unit-Size Class by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Albany	216	585	91	44	25	36	18	1	1,016
Allegany	15	47	6	14	0	0	0	0	82
Bronx	0	2,130	1,215	2,700	1,646	313	117	56	8,177
Brooklyn	0	18,231	3,297	2,192	703	229	97	48	24,797
Broome	142	381	130	44	13	10	1	0	721
Cattaraugus	175	69	12	13	2	0	0	0	271
Cayuga	6	67	17	7	3	3	1	0	104
Chautauqua	250	170	18	20	6	2	1	0	467
Chemung	12	111	20	11	10	2	0	0	166
Chenango	87	36	6	6	2	0	0	0	137
Clinton	19	146	42	21	11	3	0	0	242
Columbia	22	98	9	7	4	0	0	0	140
Cortland	38	74	17	8	6	2	1	0	146
Delaware	83	42	3	8	0	0	0	0	136
Dutchess	2,909	186	44	20	15	15	7	0	3,196
Erie	3,046	878	279	204	102	80	27	1	4,617
Essex	30	46	6	5	0	1	0	0	88
Franklin	14	65	11	4	0	0	0	0	94
Fulton	11	68	9	4	0	0	1	0	93
Genesee	12	53	5	10	7	2	0	0	89
Greene	526	63	22	15	0	0	0	0	626
Hamilton	6	4	0	0	0	0	0	0	10
Herkimer	12	76	6	13	4	1	0	0	112
Jefferson	94	97	21	29	9	6	5	0	261
Lewis	16	15	4	1	2	0	0	0	38
Livingston	28	54	14	24	6	1	0	0	127
Madison	19	75	15	18	2	0	0	0	129
Manhattan	1	7,636	6,062	5,015	1,803	895	541	128	22,081
Monroe	313	717	191	195	124	106	53	3	1,702
Montgomery	31	66	3	3	3	0	0	0	106
Nassau	3,019	71	37	29	36	15	3	0	3,210
Niagara	315	341	81	78	19	9	2	0	845
Continued									

County	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Oneida	172	293	42	42	21	15	1	0	586
Onondaga	861	483	190	145	83	50	25	1	1,838
Ontario	226	85	16	27	19	8	1	0	382
Orange	861	208	31	38	31	8	0	0	1,177
Orleans	9	46	5	13	1	1	0	0	75
Oswego	64	91	22	32	7	3	0	0	219
Otsego	99	73	5	4	1	1	0	0	183
Putnam	153	52	5	12	2	1	0	0	225
Queens	0	6,279	1,258	1,276	1,102	570	211	47	10,743
Rensselaer	724	51	19	8	4	1	1	0	808
Rockland	6,590	201	42	43	32	20	8	1	6,937
Saratoga	144	169	41	62	32	18	7	0	473
Schenectady	9	252	70	24	13	14	2	0	384
Schoharie	31	31	9	7	2	0	0	0	80
Schuyler	10	6	1	3	0	0	0	0	20
Seneca	5	22	4	13	2	1	0	0	47
St Lawrence	62	115	20	9	6	1	0	0	213
Staten Island	0	287	115	91	96	58	22	4	673
Steuben	22	77	17	17	9	2	0	0	144
Suffolk	5,711	0	0	0	0	0	0	0	5,711
Sullivan	757	108	24	20	10	2	0	0	921
Tioga	12	35	8	6	0	0	0	0	61
Tompkins	61	260	36	35	18	8	4	0	422
Ulster	223	250	51	24	18	12	1	0	579
Warren	28	86	21	15	3	3	2	0	158
Washington	14	63	8	9	2	2	0	0	98
Wayne	13	75	11	30	7	3	0	0	139
Westchester	23,524	848	224	165	154	63	102	1	25,081
Wyoming	6	30	5	15	0	0	0	0	56
Yates	6	22	2	1	1	0	0	0	32
<b>Total NYS</b>	<b>51,864</b>	<b>43,296</b>	<b>13,995</b>	<b>12,948</b>	<b>6,239</b>	<b>2,596</b>	<b>1,262</b>	<b>291</b>	<b>132,491</b>

**Table D-4. Multifamily Properties by Age-of-Building Class per County**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2012	Total
Albany	110	163	354	271	84	34	1,016
Allegany	7	9	31	12	20	3	82
Bronx	0	43	6,822	632	165	515	8,177
Brooklyn	0	538	21,446	386	388	2,039	24,797
Broome	30	0	4	560	120	7	721
Cattaraugus	147	20	56	20	23	5	271
Cayuga	1	2	48	31	21	1	104
Chautauqua	205	62	94	59	44	3	467
Chemung	4	2	57	69	26	8	166
Chenango	75	6	13	23	19	1	137
Clinton	26	3	37	85	84	7	242
Columbia	5	10	19	67	36	3	140
Cortland	5	7	6	81	41	6	146
Delaware	68	1	17	27	20	3	136
Dutchess	2,752	36	170	124	85	29	3,196
Erie	3,035	127	779	460	156	60	4,617
Essex	2	0	52	16	16	2	88
Franklin	2	3	64	7	14	4	94
Fulton	3	3	67	11	8	1	93
Genesee	4	15	20	30	18	2	89
Greene	432	2	27	62	95	8	626
Hamilton	2	0	1	6	1	0	10
Herkimer	7	8	66	15	16	0	112
Jefferson	53	22	40	85	51	10	261
Lewis	11	3	8	4	11	1	38
Livingston	12	1	29	37	36	12	127
Madison	15	2	8	41	61	2	129
Manhattan	1	264	19,292	1,090	673	761	22,081
Monroe	297	48	776	355	140	86	1,702
Montgomery	14	5	15	67	5	0	106
Nassau	3,002	0	58	100	39	11	3,210
Niagara	311	32	178	135	182	7	845
Continued							

County	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2012	Total
Oneida	136	20	56	269	98	7	586
Onondaga	336	16	322	571	554	39	1,838
Ontario	197	24	57	41	40	23	382
Orange	840	43	102	92	76	24	1,177
Orleans	1	4	15	30	22	3	75
Oswego	58	4	17	72	64	4	219
Otsego	86	14	11	26	45	1	183
Putnam	0	169	24	41	26	5	265
Queens	0	41	7,278	1,500	931	993	10,743
Rensselaer	600	31	54	80	29	14	808
Rockland	6,547	23	43	167	98	59	6,937
Saratoga	12	10	51	144	215	41	473
Schenectady	202	1	28	53	76	24	384
Schoharie	16	3	26	11	17	7	80
Schuyler	10	0	1	3	5	1	20
Seneca	2	4	6	19	13	3	47
St Lawrence	26	10	17	100	56	4	213
Staten Island	0	7	249	171	213	33	673
Steuben	12	21	32	34	42	3	144
Suffolk	5,641	0	2	11	52	5	5,711
Sullivan	734	4	80	58	39	6	921
Tioga	1	6	14	12	22	6	61
Tompkins	400	0	2	4	2	14	422
Ulster	215	13	75	173	78	25	579
Warren	3	1	11	86	37	20	158
Washington	12	0	16	46	16	8	98
Wayne	8	10	19	39	51	12	139
Westchester	21,422	32	630	1,216	1,659	122	25,081
Wyoming	3	4	18	12	13	6	56
Yates	3	5	2	15	6	1	32
<b>Total NYS</b>	<b>48,161</b>	<b>1,957</b>	<b>59,912</b>	<b>10,064</b>	<b>7,293</b>	<b>5,144</b>	<b>132,531</b>

**Table D-5. Multifamily Buildings by Number-of-Stories Class by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	More than 20 Stories	Total
Albany	109	1,389	58	12	4	0	1,572
Allegany	7	98	1	0	1	0	107
Bronx	14	2,593	4,657	2,882	435	141	10,722
Brooklyn	94	9,947	15,360	2,394	350	153	28,298
Broome	29	900	11	5	1	0	946
Cattaraugus	148	170	0	1	0	0	319
Cayuga	1	136	3	1	2	0	143
Chautauqua	204	330	8	0	0	0	542
Chemung	2	215	0	2	0	0	219
Chenango	84	87	0	0	0	0	171
Clinton	2	379	2	5	1	0	389
Columbia	9	186	1	0	0	0	196
Cortland	5	200	6	0	0	0	211
Delaware	63	95	1	0	0	0	159
Dutchess	2,785	746	19	2	7	0	3,559
Erie	3,047	2,104	62	39	13	1	5,266
Essex	2	115	3	0	0	0	120
Franklin	3	109	1	1	0	0	114
Fulton	3	101	2	0	0	0	106
Genesee	4	113	0	1	0	0	118
Greene	431	318	2	0	2	0	753
Hamilton	2	11	0	0	0	0	13
Herkimer	6	120	3	3	0	0	132
Jefferson	53	362	5	3	0	0	423
Lewis	11	33	0	0	0	0	44
Livingston	13	195	0	0	0	1	209
Madison	17	143	1	0	0	0	161
Manhattan	30	1,367	13,813	6,689	2,453	888	25,240
Monroe	304	2,504	37	19	56	2	2,922
Montgomery	32	112	4	2	0	0	150
Nassau	3,007	257	23	38	0	3	3,328
Niagara	309	730	2	7	1	0	1,049
							Continued

County	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	More than 20 Stories	Total
Oneida	144	604	13	9	2	0	772
Onondaga	342	1,908	31	23	14	12	2,330
Ontario	197	305	4	1	1	1	509
Orange	860	460	12	2	0	0	1,334
Orleans	1	103	1	0	0	0	105
Oswego	53	250	4	0	0	0	307
Otsego	82	120	0	0	0	1	203
Putnam	150	111	2	0	1	9	273
Queens	39	17,970	2,842	2,761	331	40	23,983
Rensselaer	759	161	1	0	1	0	922
Rockland	6,542	608	23	26	0	0	7,199
Saratoga	10	787	14	1	0	0	812
Schenectady	5	486	17	1	0	0	509
Schoharie	13	119	0	0	0	0	132
Schuyler	10	16	0	0	0	0	26
Seneca	2	68	1	0	0	0	71
St Lawrence	26	289	0	0	5	3	323
Staten Island	0	7,297	108	192	13	0	7,610
Steuben	12	215	1	0	0	0	228
Suffolk	5,729	36	0	0	0	0	5,765
Sullivan	740	337	8	1	0	0	1,086
Tioga	1	73	0	0	0	0	74
Tompkins	12	546	40	10	0	0	608
Ulster	271	678	18	3	0	0	970
Warren	1	288	0	3	1	0	293
Washington	5	137	0	0	0	0	142
Wayne	8	215	1	0	0	0	224
Westchester	23,211	1,217	506	240	96	5	25,275
Wyoming	3	71	0	0	2	0	76
Yates	3	46	0	0	0	0	49
<b>Total NYS</b>	<b>50,061</b>	<b>61,686</b>	<b>37,732</b>	<b>15,379</b>	<b>3,793</b>	<b>1,260</b>	<b>169,911</b>



**Table D-6. Multifamily Buildings by Unit-Size Class by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Albany	300	607	132	76	76	217	139	25	1,572
Allegany	16	57	10	24	0	0	0	0	107
Bronx	0	2,577	1,397	3,005	1,919	757	463	604	10,722
Brooklyn	0	19,451	3,753	2,993	1,044	466	219	372	28,298
Broome	225	423	143	83	21	42	9	0	946
Cattaraugus	186	83	21	27	2	0	0	0	319
Cayuga	6	72	22	28	4	5	6	0	143
Chautauqua	255	197	31	28	15	14	2	0	542
Chemung	14	120	26	21	33	5	0	0	219
Chenango	93	52	13	8	5	0	0	0	171
Clinton	24	185	80	43	38	19	0	0	389
Columbia	32	121	12	9	22	0	0	0	196
Cortland	50	100	31	14	11	3	2	0	211
Delaware	87	57	4	11	0	0	0	0	159
Dutchess	3,051	224	68	38	64	47	67	0	3,559
Erie	3,048	981	354	339	211	214	113	6	5,266
Essex	44	57	12	6	0	1	0	0	120
Franklin	15	70	17	12	0	0	0	0	114
Fulton	12	77	12	4	0	0	1	0	106
Genesee	15	63	8	14	15	3	0	0	118
Greene	545	98	73	37	0	0	0	0	753
Hamilton	9	4	0	0	0	0	0	0	13
Herkimer	14	85	6	13	13	1	0	0	132
Jefferson	143	107	31	53	39	28	22	0	423
Lewis	16	16	5	2	5	0	0	0	44
Livingston	41	63	22	44	36	3	0	0	209
Madison	21	90	22	26	2	0	0	0	161
Manhattan	0	7,998	6,591	5,816	2,274	1,147	792	622	25,240
Monroe	336	796	252	350	346	424	406	12	2,922
Montgomery	43	77	4	6	20	0	0	0	150
Nassau	3,065	92	41	40	61	23	6	0	3,328
Niagara	315	382	112	129	52	52	7	0	1,049
Continued									

County	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Oneida	184	330	67	86	40	62	3	0	772
Onondaga	944	526	230	208	195	142	83	2	2,330
Ontario	245	110	22	46	44	38	4	0	509
Orange	901	232	45	74	69	13	0	0	1,334
Orleans	10	49	12	29	1	4	0	0	105
Oswego	71	106	35	64	25	6	0	0	307
Otsego	108	80	5	6	1	3	0	0	203
Putnam	158	74	9	21	10	1	0	0	273
Queens	0	7,188	1,838	2,600	3,315	5,703	2,717	622	23,983
Rensselaer	798	66	29	10	9	4	6	0	922
Rockland	6,645	239	56	66	97	55	30	11	7,199
Saratoga	159	213	64	126	88	72	90	0	812
Schenectady	9	262	76	45	36	64	17	0	509
Schoharie	37	47	15	18	15	0	0	0	132
Schuyler	10	10	1	5	0	0	0	0	26
Seneca	7	27	9	19	5	4	0	0	71
St Lawrence	71	161	44	27	14	6	0	0	323
Staten Island	0	493	359	1,147	3,232	1,748	588	43	7,610
Steuben	24	101	25	42	28	8	0	0	228
Suffolk	5,765	0	0	0	0	0	0	0	5,765
Sullivan	774	135	70	60	40	7	0	0	1,086
Tioga	12	40	12	10	0	0	0	0	74
Tompkins	68	295	52	95	50	39	9	0	608
Ulster	241	373	142	68	80	61	5	0	970
Warren	40	105	44	61	7	21	15	0	293
Washington	14	75	12	31	4	6	0	0	142
Wayne	17	92	18	59	15	23	0	0	224
Westchester	23,539	866	234	206	196	115	118	1	25,275
Wyoming	7	36	7	26	0	0	0	0	76
Yates	6	26	4	4	9	0	0	0	49
<b>Total NYS</b>	<b>52,885</b>	<b>47,739</b>	<b>16,841</b>	<b>18,558</b>	<b>13,953</b>	<b>11,676</b>	<b>5,939</b>	<b>2,320</b>	<b>169,911</b>

**Table D-7. Multifamily Buildings by Age-of-Building Class by County**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2013	Total
Albany	110	168	433	537	226	98	1,572
Allegany	7	9	39	18	29	5	107
Bronx	0	37	7,992	1,184	670	839	10,722
Brooklyn	0	582	23,427	844	948	2,497	28,298
Broome	31	0	4	725	169	17	946
Cattaraugus	149	20	64	32	43	11	319
Cayuga	1	2	51	43	30	16	143
Chautauqua	205	64	113	95	61	4	542
Chemung	5	2	60	79	56	17	219
Chenango	77	8	19	35	31	1	171
Clinton	32	3	44	143	156	11	389
Columbia	11	10	23	86	52	14	196
Cortland	5	12	9	106	69	10	211
Delaware	69	1	19	42	23	5	159
Dutchess	2,762	39	219	251	205	83	3,559
Erie	3,049	137	932	689	265	194	5,266
Essex	2	0	62	25	29	2	120
Franklin	2	3	65	9	26	9	114
Fulton	3	3	72	13	14	1	106
Genesee	4	17	25	47	23	2	118
Greene	432	3	34	129	130	25	753
Hamilton	2	0	1	9	1	0	13
Herkimer	8	9	73	19	23	0	132
Jefferson	53	24	50	115	157	24	423
Lewis	11	3	8	4	17	1	44
Livingston	13	1	32	57	72	34	209
Madison	17	2	11	47	82	2	161
Manhattan	0	432	21,526	1,552	885	845	25,240
Monroe	298	52	861	948	462	301	2,922
Montgomery	15	5	20	102	8	0	150
Nassau	3,006	0	96	142	72	12	3,328
Niagara	311	38	202	220	259	19	1,049
Continued							

County	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2013	Total
Oneida	141	21	74	341	177	18	772
Onondaga	339	17	353	768	754	99	2,330
Ontario	197	36	67	68	88	53	509
Orange	863	43	116	150	121	41	1,334
Orleans	1	4	16	35	41	8	105
Oswego	67	4	19	94	115	8	307
Otsego	90	14	12	32	54	1	203
Putnam	150	2	16	52	44	9	273
Queens	0	55	12,015	8,405	2,217	1,291	23,983
Rensselaer	612	36	68	130	49	27	922
Rockland	6,548	26	55	293	193	84	7,199
Saratoga	12	11	60	196	396	137	812
Schenectady	216	1	37	88	106	61	509
Schoharie	20	5	31	17	41	18	132
Schuyler	10	0	1	4	8	3	26
Seneca	2	5	7	28	24	5	71
St Lawrence	27	10	22	144	113	7	323
Staten Island	0	20	512	1,022	5,970	86	7,610
Steuben	12	28	41	57	73	17	228
Suffolk	5,643	0	7	20	89	6	5,765
Sullivan	743	4	108	134	82	15	1,086
Tioga	1	7	15	15	28	8	74
Tompkins	547	0	4	9	2	46	608
Ulster	271	14	94	331	189	71	970
Warren	4	2	15	125	95	52	293
Washington	12	0	16	58	36	20	142
Wayne	8	11	23	63	96	23	224
Westchester	21,428	36	650	1,297	1,742	122	25,275
Wyoming	3	4	19	17	21	12	76
Yates	3	6	2	15	22	1	49
<b>Total NYS</b>	<b>48,660</b>	<b>2,108</b>	<b>71,061</b>	<b>22,355</b>	<b>18,279</b>	<b>7,448</b>	<b>169,911</b>

**Table D-8. Multifamily Units by Number-of-Stories Class by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	More than 20 Stories	Total
Albany	0	16,297	1,250	985	452	0	18,984
Allegany	0	816	30	0	0	0	846
Bronx	988	14,107	111,383	185,793	76,043	38,953	427,267
Brooklyn	2,848	60,023	167,773	105,051	43,298	21,791	400,784
Broome	0	7,540	167	95	116	0	7,918
Cattaraugus	9	1,041	0	99	0	0	1,149
Cayuga	0	1,502	22	6	243	0	1,773
Chautauqua	0	2,788	131	0	0	0	2,919
Chemung	160	2,078	0	166	0	0	2,404
Chenango	6	625	0	0	0	0	631
Clinton	0	3,007	60	234	124	0	3,425
Columbia	0	1,181	15	0	0	0	1,196
Cortland	0	1,564	374	0	0	0	1,938
Delaware	0	546	5	0	0	0	551
Dutchess	314	6,953	206	239	0	0	7,712
Erie	66	35,262	2,835	3,794	1,282	24	43,263
Essex	0	457	174	0	0	0	631
Franklin	5	683	14	9	0	0	711
Fulton	0	846	81	0	0	0	927
Genesee	6	1,332	0	131	0	0	1,469
Greene	0	1,126	0	0	5	0	1,131
Hamilton	0	25	0	0	0	0	25
Herkimer	0	1,090	73	215	0	0	1,378
Jefferson	0	4,280	209	112	0	0	4,601
Lewis	0	306	0	0	0	0	306
Livingston	45	1,744	0	0	0	6	1,795
Madison	52	1,317	0	0	0	0	1,369
Manhattan	1,357	11,195	181,715	222,352	252,658	188,055	857,332
Monroe	330	47,277	1,353	830	4,043	504	54,337
Montgomery	0	694	24	69	0	0	787
Nassau	104	3,076	594	3,640	0	8	7,422
Niagara	0	8,290	32	132	250	0	8,704
							Continued

County	Missing	1 to 3 Stories	4 to 5 Stories	6 to 10 Stories	11 to 20 Stories	More than 20 Stories	Total
Oneida	175	6,027	504	661	186	0	7,553
Onondaga	0	26,251	1,024	1,556	1,516	908	31,255
Ontario	42	4,209	33	51	8	0	4,343
Orange	1,330	4,786	229	65	0	0	6,410
Orleans	0	918	30	0	0	0	948
Oswego	0	2,587	189	0	0	0	2,776
Otsego	0	804	0	0	0	6	810
Putnam	0	886	8	0	8	83	985
Queens	1,226	79,117	49,591	180,220	43,455	11,997	365,606
Rensselaer	57	1,525	0	0	7	0	1,589
Rockland	779	8,499	859	809	0	0	10,946
Saratoga	0	10,416	365	111	0	0	10,892
Schenectady	0	6,385	486	61	0	0	6,932
Schoharie	0	719	0	0	0	0	719
Schuyler	0	130	0	0	0	0	130
Seneca	0	828	40	0	0	0	868
St Lawrence	0	1,846	0	0	7	7	1,860
Staten Island	172	15,062	1,696	12,579	1,351	0	30,860
Steuben	0	2,063	82	0	0	0	2,145
Suffolk	0	0	0	0	0	0	0
Sullivan	11	2,612	144	92	0	0	2,859
Tioga	0	492	0	0	0	0	492
Tompkins	0	5,850	767	307	0	0	6,924
Ulster	183	5,733	293	111	0	0	6,320
Warren	0	2,491	0	0	8	0	2,499
Washington	0	1,267	0	0	0	0	1,267
Wayne	0	2,431	65	0	0	0	2,496
Westchester	290	10,822	9,732	18,319	22,629	632	62,424
Wyoming	0	661	0	0	5	0	666
Yates	0	278	0	0	0	0	278
<b>Total NYS</b>	<b>10,555</b>	<b>444,763</b>	<b>534,657</b>	<b>738,894</b>	<b>447,694</b>	<b>262,974</b>	<b>2,439,537</b>

**Table D-9. Multifamily Units by Unit-Size Class by County (2012)**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Albany	0	3,792	1,339	1,476	1,909	5,411	4,537	520	18,984
Allegany	0	305	88	453	0	0	0	0	846
Bronx	0	15,010	19,193	91,844	109,247	41,212	35,325	115,436	427,267
Brooklyn	0	124,463	50,706	70,794	48,736	30,866	30,018	45,201	400,784
Broome	0	2,417	1,804	1,324	924	1,203	246	0	7,918
Cattaraugus	0	426	171	375	177	0	0	0	1,149
Cayuga	0	423	230	246	173	371	330	0	1,773
Chautauqua	0	1,044	266	629	460	218	302	0	2,919
Chemung	0	698	282	369	757	298	0	0	2,404
Chenango	0	224	85	196	126	0	0	0	631
Clinton	0	955	605	653	768	444	0	0	3,425
Columbia	0	610	119	207	260	0	0	0	1,196
Cortland	0	449	218	227	437	247	360	0	1,938
Delaware	0	264	36	251	0	0	0	0	551
Dutchess	0	1,157	658	636	1,130	2,020	2,111	0	7,712
Erie	0	5,690	4,016	6,519	7,313	11,278	7,831	616	43,263
Essex	0	288	93	128	0	122	0	0	631
Franklin	0	431	152	128	0	0	0	0	711
Fulton	0	399	135	153	0	0	240	0	927
Genesee	0	328	77	323	482	259	0	0	1,469
Greene	0	406	299	426	0	0	0	0	1,131
Hamilton	0	25	0	0	0	0	0	0	25
Herkimer	0	463	86	414	303	112	0	0	1,378
Jefferson	0	608	296	934	778	781	1,204	0	4,601
Lewis	0	90	63	22	131	0	0	0	306
Livingston	0	340	208	677	460	110	0	0	1,795
Madison	0	475	210	560	124	0	0	0	1,369
Manhattan	0	59,213	96,826	158,960	126,430	126,251	161,183	128,469	857,332
Monroe	0	4,566	2,777	6,465	8,846	15,414	14,731	1,538	54,337
Montgomery	0	401	48	69	269	0	0	0	787
Nassau	0	454	544	1,038	2,623	2,092	671	0	7,422
Niagara	0	2,151	1,136	2,282	1,409	1,226	500	0	8,704
Continued									

County	Missing	5 to 10 Units	11 to 20 Units	21 to 50 Units	51 to 100 Units	101 to 200 Units	201 to 500 Units	>500 Units	Total
Oneida	0	1,777	621	1,431	1,494	1,960	270	0	7,553
Onondaga	0	3,166	2,785	4,693	5,913	6,933	7,168	597	31,255
Ontario	0	542	239	941	1,368	1,013	240	0	4,343
Orange	0	1,323	464	1,294	2,252	1,077	0	0	6,410
Orleans	0	296	74	380	96	102	0	0	948
Oswego	0	553	330	1,096	439	358	0	0	2,776
Otsego	0	452	72	122	54	110	0	0	810
Putnam	0	335	57	321	136	136	0	0	985
Queens	0	39,374	19,846	42,446	79,240	78,920	61,438	44,342	365,606
Rensselaer	0	328	259	208	340	174	280	0	1,589
Rockland	0	1,259	615	1,427	2,312	2,734	2,095	504	10,946
Saratoga	0	1,113	625	2,099	2,420	2,419	2,216	0	10,892
Schenectady	0	1,624	1,014	722	929	1,991	652	0	6,932
Schoharie	0	196	128	266	129	0	0	0	719
Schuyler	0	34	16	80	0	0	0	0	130
Seneca	0	138	58	416	138	118	0	0	868
St Lawrence	0	737	285	292	409	137	0	0	1,860
Staten Island	0	1,909	1,755	3,120	7,064	7,500	7,143	2,369	30,860
Steuben	0	485	232	545	631	252	0	0	2,145
Suffolk	0	0	0	0	0	0	0	0	0
Sullivan	0	706	348	686	752	367	0	0	2,859
Tioga	0	218	109	165	0	0	0	0	492
Tompkins	0	1,724	526	1,037	1,187	1,246	1,204	0	6,924
Ulster	0	1,607	743	784	1,300	1,659	227	0	6,320
Warren	0	549	292	453	233	462	510	0	2,499
Washington	0	386	104	329	116	332	0	0	1,267
Wayne	0	477	171	1,010	495	343	0	0	2,496
Westchester	0	5,730	3,374	5,743	11,133	8,479	27,420	545	62,424
Wyoming	0	179	75	412	0	0	0	0	666
Yates	0	127	32	28	91	0	0	0	278
<b>Total NYS</b>	<b>0</b>	<b>295,909</b>	<b>218,015</b>	<b>421,324</b>	<b>434,943</b>	<b>358,757</b>	<b>370,452</b>	<b>340,137</b>	<b>2,439,537</b>



**Table D-10. Multifamily Units by Age-of-Building Class by County**

Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2013	Total
Albany	6	1,172	4,121	8,592	3,101	1,992	18,984
Allegany	0	51	187	165	389	54	846
Bronx	0	1,308	241,786	149,945	13,938	20,290	427,267
Brooklyn	0	6,296	267,285	63,033	17,289	46,881	400,784
Broome	12	0	0	5,064	2,659	183	7,918
Cattaraugus	87	134	245	157	500	26	1,149
Cayuga	0	11	312	947	473	30	1,773
Chautauqua	12	596	641	948	601	121	2,919
Chemung	200	12	351	972	731	138	2,404
Chenango	13	30	43	234	303	8	631
Clinton	307	37	301	1,386	1,253	141	3,425
Columbia	52	55	95	444	446	104	1,196
Cortland	0	8	12	929	565	424	1,938
Delaware	24	5	79	133	280	30	551
Dutchess	284	177	969	1,615	2,637	2,030	7,712
Erie	162	1,232	11,312	18,598	8,022	3,937	43,263
Essex	0	0	244	89	268	30	631
Franklin	0	15	394	44	224	34	711
Fulton	0	48	491	92	296	0	927
Genesee	6	90	116	638	558	61	1,469
Greene	5	11	78	339	603	95	1,131
Hamilton	0	0	7	10	8	0	25
Herkimer	55	37	549	314	423	0	1,378
Jefferson	0	144	308	1,002	2,536	611	4,601
Lewis	0	13	31	26	231	5	306
Livingston	45	0	144	522	724	360	1,795
Madison	52	5	44	327	869	72	1,369
Manhattan	0	6,178	484,294	200,207	105,362	61,291	857,332
Monroe	243	366	8,954	24,727	12,923	7,124	54,337
Montgomery	0	22	46	613	106	0	787
Nassau	134	0	663	5,209	1,172	244	7,422
Niagara	24	206	1,459	3,090	3,672	253	8,704
Continued							

County	Missing	Before 1900	1900 to 1949	1950 to 1974	1975 to 1999	2000 to 2013	Total
Oneida	86	124	547	3,623	2,993	180	7,553
Onondaga	0	187	3,478	16,671	8,309	2,610	31,255
Ontario	42	163	403	1,020	1,489	1,226	4,343
Orange	1,338	268	709	1,548	1,828	719	6,410
Orleans	0	12	120	286	478	52	948
Oswego	97	24	115	1,020	1,450	70	2,776
Otsego	39	63	34	191	483	0	810
Putnam	136	10	77	290	397	75	985
Queens	0	1,272	146,167	173,452	20,992	23,723	365,606
Rensselaer	46	29	79	443	544	448	1,589
Rockland	869	113	274	4,667	4,400	623	10,946
Saratoga	11	52	219	1,538	5,902	3,170	10,892
Schenectady	2,083	5	340	1,701	1,553	1,250	6,932
Schoharie	37	17	77	136	299	153	719
Schuyler	0	0	6	15	85	24	130
Seneca	0	28	35	311	348	146	868
St Lawrence	9	40	84	935	775	17	1,860
Staten Island	0	233	3,576	14,723	11,533	795	30,860
Steuben	0	136	234	759	800	216	2,145
Suffolk	0	0	0	0	0	0	0
Sullivan	38	29	536	1,124	830	302	2,859
Tioga	0	28	65	88	223	88	492
Tompkins	5,921	0	42	255	0	706	6,924
Ulster	183	159	589	2,927	1,722	740	6,320
Warren	6	8	38	890	911	646	2,499
Washington	27		80	300	251	609	1,267
Wayne	0	56	104	524	1,438	374	2,496
Westchester	354	131	5,664	21,760	34,232	283	62,424
Wyoming	0	20	136	132	262	116	666
Yates	0	32	10	88	148	0	278
<b>Total NYS</b>	<b>13,045</b>	<b>21,498</b>	<b>1,189,399</b>	<b>741,828</b>	<b>287,837</b>	<b>185,930</b>	<b>2,439,537</b>

**Table D-11. Multifamily New Building Permits by County and Year (2004-2012)**

Source: U.S. Census Building Permits Survey (004-2012)

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Albany	34	38	5	4	8	0	5	11	16	121
Allegany	2	0	0	1	0	0	0	0	0	3
Bronx	72	96	70	50	59	43	19	30	51	490
Brooklyn	240	328	319	324	443	42	52	44	105	1,897
Broome	1	1	0	2	0	3	0	0	0	7
Cattaraugus	0	0	2	0	4	0	1	0	0	7
Cayuga	0	0	0	0	0	0	1	0	0	1
Chautauqua	1	17	0	0	2	2	0	3	3	28
Chemung	0	0	0	0	0	1	0	8	8	17
Chenango	8	8	10	10	11	6	8	7	12	80
Clinton	2	1	6	2	2	2	1	4	2	22
Columbia	0	0	1	0	0	0	0	0	1	2
Cortland	1	0	0	0	4	1	0	0	0	6
Delaware	4	0	0	2	0	0	0	0	0	6
Dutchess	9	8	14	30	27	2	0	2	2	94
Erie	32	23	16	17	17	3	11	30	21	170
Essex	0	0	0	0	0	0	0	0	2	2
Franklin	0	0	1	0	0	0	0	0	0	1
Fulton	0	0	0	0	0	0	0	0	5	5
Genesee	0	0	0	4	0	1	0	0	0	5
Greene	0	2	0	1	0	1	0	0	0	4
Hamilton	0	0	0	0	0	0	0	0	0	0
Herkimer	0	0	1	0	0	0	0	0	0	1
Jefferson	0	0	1	5	0	0	8	7	28	49
Lewis	0	0	0	0	0	0	0	0	0	0
Livingston	0	0	0	2	0	1	3	7	3	16
Madison	0	0	0	1	1	0	0	0	0	2
Manhattan	71	104	101	106	149	30	8	26	36	631
Monroe	9	4	8	12	10	17	21	11	12	104
Montgomery	0	0	0	0	0	0	11	12	8	31
Nassau	8	4	13	5	38	1	2	20	14	105
Niagara	1	1	1	9	4	2	0	1	1	20
Oneida	0	3	5	5	2	2	3	0	1	21
Onondaga	3	18	13	8	7	7	7	16	10	89
Continued										

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Ontario	1	3	8	1	14	0	1	5	4	37
Orange	22	68	37	36	40	9	46	51	43	352
Orleans	0	0	0	2	0	0	1	1	0	4
Oswego	0	1	0	0	0	10	1	9	0	21
Otsego	0	0	0	0	0	1	0	0	1	2
Putnam	0	0	1	3	1	1	1	5	0	12
Queens	103	150	142	134	184	46	47	37	41	884
Rensselaer	13	37	7	0	0	5	13	5	12	92
Rockland	5	7	23	17	4	3	6	21	16	102
St. Lawrence	0	0	0	0	1	1	2	0	0	4
Saratoga	6	27	8	43	10	7	6	54	53	214
Schenectady	6	7	4	22	11	5	0	1	5	61
Schoharie	2	4	10	2	1	0	0	0	0	19
Schuyler	0	0	0	3	0	0	0	0	1	4
Seneca	0	0	0	0	0	1	1	1	1	4
Staten Island	4	6	8	3	33	6	1	1	4	66
Steuben	0	0	2	0	0	0	0	2	0	4
Suffolk	15	47	11	4	34	9	4	3	15	142
Sullivan	8	20	1	2	1	1	0	0	0	33
Tioga	0	0	0	1	0	1	0	0	0	2
Tompkins	0	13	15	5	7	3	5	7	18	73
Ulster	4	11	2	7	2	6	9	8	5	54
Warren	10	1	5	0	0	0	0	0	0	16
Washington	0	46	1	1	2	2	2	1	1	56
Wayne	0	10	0	0	7	4	2	0	0	23
Westchester	33	12	8	10	4	6	4	27	15	119
Wyoming	2	1	0	0	0	0	0	1	0	4
Yates	5	8	0	0	0	0	0	0	0	13
<b>NYS Total</b>	<b>737</b>	<b>1,135</b>	<b>880</b>	<b>896</b>	<b>1,144</b>	<b>294</b>	<b>313</b>	<b>479</b>	<b>576</b>	<b>6,454</b>

**Table D-12. Multifamily New Units Permitted by County and Year (2004-2012)**

Source: U.S. Census Building Permits Survey (2004-2012)

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Albany	296	350	70	34	372	0	38	92	200	1,452
Allegany	46	0	0	8	0	0	0	0	0	54
Bronx	3,092	3,038	2,456	1,669	1,924	1,435	961	1,024	2,356	17,955
Brooklyn	3,950	5,729	6,495	8,825	11,858	765	1,877	1,195	2,959	43,653
Broome	13	12	0	18	0	40	0	0	0	83
Cattaraugus	0	0	27	0	32	0	8	0	0	67
Cayuga	0	0	0	0	0	0	13	0	0	13
Chautauqua	7	228	0	0	40	37	0	41	53	406
Chemung	0	0	0	0	0	32	0	96	80	208
Chenango	40	40	52	51	60	30	41	39	68	421
Clinton	16	60	50	24	119	55	15	20	35	394
Columbia	0	0	96	0	0	0	0	0	32	128
Cortland	12	0	0	0	127	6	0	0	0	145
Delaware	28	0	0	10	0	0	0	0	0	38
Dutchess	96	138	124	353	381	11	0	16	54	1,173
Erie	491	231	416	280	406	207	422	273	258	2,984
Essex	0	0	0	0	0	0	0	0	94	94
Franklin	0	0	6	0	0	0	0	0	0	6
Fulton	0	0	0	0	0	0	0	0	116	116
Genesee	0	0	0	63	0	42	0	0	0	105
Greene	0	20	0	8	0	21	0	0	0	49
Hamilton	0	0	0	0	0	0	0	0	0	0
Herkimer	0	0	5	0	0	0	0	0	0	5
Jefferson	0	0	30	37	0	0	86	84	247	484
Lewis	0	0	0	0	0	0	0	0	0	0
Livingston	0	0	0	24	0	8	17	39	15	103
Madison	0	0	0	24	27	0	0	0	0	51
Manhattan	4,497	8,464	8,759	9,485	9,697	1,347	697	2,531	2,320	47,797
Monroe	468	313	170	140	104	340	142	174	235	2,086
Montgomery	0	0	0	0	0	0	108	86	96	290
Nassau	374	187	119	63	1,040	5	32	540	274	2,634
Niagara	109	77	50	250	49	113	0	6	8	662
Oneida	0	28	50	43	16	82	22	0	9	250
Onondaga	40	144	276	160	151	121	288	455	724	2,359
Continued										

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Ontario	49	26	64	32	106	0	8	30	100	415
Orange	226	508	283	299	515	214	530	497	554	3,626
Orleans	0	0	0	25	0	0	10	10	0	45
Oswego	0	7	0	0	0	72	7	52	0	138
Otsego	0	0	0	0	0	24	0	0	15	39
Putnam	0	0	5	18	8	12	5	86	0	134
Queens	2,755	3,522	3,166	4,682	6,599	771	1,415	2,502	950	26,362
Rensselaer	135	466	140	0	0	60	130	34	128	1,093
Rockland	136	52	299	158	22	75	164	130	126	1,162
St. Lawrence	0	0	0	0	7	12	11	0	0	30
Saratoga	97	391	159	511	138	74	76	637	551	2,634
Schenectady	62	51	34	420	90	46	0	5	114	822
Schoharie	24	36	91	16	18	0	0	0	0	185
Schuyler	0	0	0	24	0	0	0	0	12	36
Seneca	0	0	0	0	0	40	33	43	64	180
Staten Island	42	106	95	31	769	170	60	80	276	1,629
Steuben	0	0	26	0	0	0	0	214	0	240
Suffolk	129	940	153	57	424	199	61	91	228	2,282
Sullivan	82	174	49	36	24	28	0	0	0	393
Tioga	0	0	0	24	0	6	0	0	0	30
Tompkins	0	102	129	103	103	15	32	35	119	638
Ulster	34	114	63	159	230	95	168	66	55	984
Warren	78	48	40	0	0	0	0	0	0	166
Washington	0	389	8	24	24	24	20	12	58	559
Wayne	0	80	0	0	110	27	16	0	0	233
Westchester	687	333	293	1,300	106	276	152	735	308	4,190
Wyoming	16	24	0	0	0	0	0	8	0	48
Yates	40	60	0	0	0	0	0	0	0	100
<b>Totals</b>	<b>18,167</b>	<b>26,488</b>	<b>24,348</b>	<b>29,488</b>	<b>35,696</b>	<b>6,937</b>	<b>7,665</b>	<b>11,978</b>	<b>13,891</b>	<b>174,658</b>

**Table D-13. New Multifamily Construction Costs (\$1,000,000) by County and Year (2004-2012)**

Source: U.S. Census Building Permits Survey (2004-2012)

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Albany	\$19	\$30	\$6	\$3	\$61	\$0	\$3	\$11	\$40	\$172
Allegany	\$3	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3
Bronx	\$205	\$224	\$193	\$139	\$175	\$158	\$112	\$95	\$217	\$1,518
Brooklyn	\$264	\$421	\$512	\$722	\$920	\$83	\$218	\$112	\$273	\$3,525
Broome	\$1	\$0	\$0	\$1	\$0	\$2	\$0	\$0	\$0	\$5
Cattaraugus	\$0	\$0	\$2	\$0	\$3	\$0	\$1	\$0	\$0	\$6
Cayuga	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Chautauqua	\$0	\$9	\$0	\$0	\$15	\$11	\$0	\$6	\$8	\$50
Chemung	\$0	\$0	\$0	\$0	\$0	\$4	\$0	\$6	\$6	\$16
Chenango	\$2	\$2	\$2	\$2	\$3	\$1	\$2	\$2	\$3	\$19
Clinton	\$1	\$6	\$3	\$1	\$12	\$7	\$3	\$1	\$4	\$37
Columbia	\$0	\$0	\$2	\$0	\$0	\$0	\$0	\$0	\$5	\$7
Cortland	\$2	\$0	\$0	\$0	\$14	\$0	\$0	\$0	\$0	\$16
Delaware	\$2	\$0	\$0	\$3	\$0	\$0	\$0	\$0	\$0	\$5
Dutchess	\$7	\$11	\$8	\$37	\$29	\$1	\$0	\$4	\$10	\$106
Erie	\$36	\$13	\$32	\$36	\$22	\$15	\$21	\$18	\$26	\$220
Essex	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9	\$9
Franklin	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fulton	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$9	\$9
Genesee	\$0	\$0	\$0	\$8	\$0	\$6	\$0	\$0	\$0	\$13
Greene	\$0	\$2	\$0	\$0	\$0	\$3	\$0	\$0	\$0	\$5
Hamilton	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Herkimer	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Jefferson	\$0	\$0	\$2	\$1	\$0	\$0	\$6	\$5	\$20	\$33
Lewis	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Livingston	\$0	\$0	\$0	\$3	\$0	\$1	\$1	\$2	\$1	\$7
Madison	\$0	\$0	\$0	\$2	\$2	\$0	\$0	\$0	\$0	\$4
Manhattan	\$299	\$635	\$691	\$792	\$909	\$143	\$79	\$225	\$219	\$3,994
Monroe	\$32	\$17	\$12	\$7	\$5	\$36	\$10	\$17	\$25	\$160
Montgomery	\$0	\$0	\$0	\$0	\$0	\$0	\$10	\$7	\$7	\$24
Nassau	\$58	\$32	\$21	\$10	\$121	\$1	\$1	\$54	\$24	\$319
Niagara	\$5	\$6	\$6	\$22	\$7	\$10	\$0	\$0	\$0	\$57
Oneida	\$0	\$3	\$4	\$3	\$0	\$21	\$1	\$0	\$2	\$34
Onondaga	\$2	\$3	\$15	\$9	\$14	\$7	\$18	\$26	\$46	\$141
Continued										

County	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total
Ontario	\$3	\$2	\$5	\$4	\$10	\$0	\$1	\$3	\$8	\$36
Orange	\$17	\$42	\$29	\$27	\$42	\$14	\$30	\$47	\$56	\$304
Orleans	\$0	\$0	\$0	\$2	\$0	\$0	\$1	\$1	\$0	\$5
Oswego	\$0	\$0	\$0	\$0	\$0	\$3	\$1	\$3	\$0	\$7
Otsego	\$0	\$0	\$0	\$0	\$0	\$2	\$0	\$0	\$6	\$8
Putnam	\$0	\$0	\$1	\$3	\$1	\$1	\$0	\$10	\$0	\$15
Queens	\$182	\$250	\$249	\$382	\$620	\$80	\$165	\$232	\$91	\$2,252
Rensselaer	\$8	\$31	\$12	\$0	\$0	\$2	\$9	\$3	\$11	\$76
Rockland	\$20	\$7	\$32	\$20	\$3	\$10	\$16	\$11	\$12	\$132
St. Lawrence	\$0	\$0	\$0	\$0	\$1	\$1	\$1	\$0	\$0	\$3
Saratoga	\$21	\$37	\$25	\$67	\$15	\$3	\$5	\$70	\$47	\$290
Schenectady	\$5	\$5	\$4	\$28	\$6	\$3	\$0	\$0	\$5	\$55
Schoharie	\$1	\$2	\$4	\$0	\$0	\$0	\$0	\$0	\$0	\$9
Schuyler	\$0	\$0	\$0	\$1	\$0	\$0	\$0	\$0	\$2	\$3
Seneca	\$0	\$0	\$0	\$0	\$0	\$5	\$4	\$5	\$8	\$23
Staten Island	\$3	\$8	\$8	\$2	\$72	\$19	\$7	\$7	\$23	\$149
Steuben	\$0	\$0	\$7	\$0	\$0	\$0	\$0	\$19	\$0	\$25
Suffolk	\$28	\$76	\$15	\$5	\$31	\$31	\$7	\$8	\$43	\$242
Sullivan	\$5	\$12	\$4	\$2	\$3	\$4	\$0	\$0	\$0	\$28
Tioga	\$0	\$0	\$0	\$2	\$0	\$0	\$0	\$0	\$0	\$3
Tompkins	\$0	\$7	\$12	\$10	\$21	\$2	\$3	\$4	\$14	\$72
Ulster	\$4	\$9	\$7	\$19	\$23	\$6	\$10	\$6	\$3	\$87
Warren	\$2	\$5	\$3	\$0	\$0	\$0	\$0	\$0	\$0	\$10
Washington	\$0	\$15	\$0	\$2	\$1	\$1	\$1	\$1	\$4	\$24
Wayne	\$0	\$7	\$0	\$0	\$9	\$2	\$1	\$0	\$0	\$18
Westchester	\$115	\$24	\$47	\$320	\$16	\$43	\$19	\$75	\$46	\$704
Wyoming	\$0	\$2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3
Yates	\$2	\$2	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4
<b>Totals</b>	<b>\$1,353</b>	<b>\$1,956</b>	<b>\$1,978</b>	<b>\$2,698</b>	<b>\$3,184</b>	<b>\$741</b>	<b>\$764</b>	<b>\$1,097</b>	<b>\$1,330</b>	<b>\$15,102</b>



**Table D-14. New Construction and Renovation Summary Statistics by County (2004-2012)**

Sources: McGraw Hill Dodge Players Reports 2004-2012; 2005 and 2010 data incomplete

County	Projects	Buildings	Value (\$1000)	Area (1000 sq. ft.)
Albany	54	204	230,187	2,832
Allegany	2	2	5,000	24
Bronx	1,346	1,947	2,766,861	23,058
Brooklyn (Kings)s	4,075	5,576	8,726,523	66,177
Broome	11	30	122,519	587
Cattaraugus	42	167	90,623	948
Cayuga	1	0	4,900	0
Chautauqua	19	53	49,941	393
Chemung	4	1	3,529	7
Chenango	0	0	0	0
Clinton	6	7	19,788	214
Columbia	2	7	8,000	50
Cortland	6	13	21,625	175
Delaware	1	4	2,000	29
Dutchess	24	568	152,020	2,008
Erie	103	269	506,286	2,558
Essex	1	9	5,000	0
Franklin	4	3	5,509	30
Fulton	9	7	12,351	55
Genesee	3	1	2,522	0
Greene	0	0	0	0
Hamilton	0	0	0	0
Herkimer	1	0	350	0
Jefferson	13	128	124,110	1,017
Lewis	0	0	0	0
Livingston	2	16	3,000	10
Madison	2	10	14,993	81
Manhattan (New York)	6,714	4,698	14,275,899	77,538
Monroe	93	499	394,479	2,660
Montgomery	6	7	7,711	65
Nassau	36	120	452,137	2,655
Niagara	19	100	107,641	1,747
Oneida	9	27	43,232	336
Continued				

County	Projects	Buildings	Value (\$1000)	Area (1000 sq. ft.)
Onondaga	83	185	196,685	1,169
Ontario	15	151	88,975	1,006
Orange	17	353	226,760	1,685
Orleans	1	0	250	0
Oswego	5	9	17,725	0
Otsego	2	0	2,000	0
Putnam	1	3	5,000	60
Queens	1,714	2,411	3,819,691	30,601
Rensselaer	39	187	176,553	1,173
Rockland	12	73	84,742	1,330
St. Lawrence	6	0	1,105	0
Saratoga	38	258	242,148	3,284
Schenectady	27	47	43,951	401
Schoharie	0	0	0	0
Schuyler	0	0	0	0
Seneca	0	0	0	0
Staten Island (Richmond)	217	236	387,235	2,550
Steuben	7	1	9,626	20
Suffolk	44	340	339,514	3,437
Sullivan	8	105	45,625	431
Tioga	0	0	0	0
Tompkins	13	39	119,100	585
Ulster	13	77	43,843	344
Warren	19	59	33,996	386
Washington	0	0	0	0
Wayne	5	4	11,581	57
Westchester	72	195	531,197	4,475
Wyoming	0	0	0	0
Yates	1	6	2,800	36
<b>Totals</b>	<b>14,967</b>	<b>19,212</b>	<b>34,588,838</b>	<b>238,284</b>

**Table D-15. Multifamily New Construction Only Building Projects by County (2004-2012)**

Source: McGraw Hill Dodge Players Reports 2004-2012; 2005 and 2010 data incomplete

County	Projects	Buildings	Value (\$1000)	Area (1000 sq. ft.)
Albany	35	197	134,957	2,351
Allegany	1	1	1,800	24
Bronx	734	1,555	2,283,879	21,700
Brooklyn	2,014	3,057	6,833,520	56,355
Broome	4	28	108,250	583
Cattaraugus	23	134	79,161	889
Cayuga	0	0	0	0
Chautauqua	13	53	43,866	393
Chemung	1	1	750	7
Chenang	0	0	0	0
Clinton	3	7	16,300	214
Columbia	1	7	7,500	50
Cortland	5	13	21,250	175
Delaware	1	4	2,000	29
Dutchess	14	563	129,700	1,991
Erie	42	245	264,556	2,208
Essex	1	9	5,000	0
Franklin	1	2	5,000	29
Fulton	2	5	2,500	45
Genesee	0	0	0	0
Greene	0	0	0	0
Jefferson	7	113	117,499	1,017
Lewis	0	0	0	0
Livingston	1	16	1,000	10
Madison	1	10	14,000	81
Manhattan	564	626	10,523,585	62,176
Monroe	50	422	279,624	2,636
Montgomery	1	7	6,000	65
Nassau	20	88	349,899	2,655
Niagara	8	97	58,205	1,728
Oneida	5	25	34,000	330
Onondaga	35	143	130,733	981
Ontario	13	151	88,600	1,006
Orange	12	341	200,467	1,570
Continued				

County	Projects	Buildings	Value (\$1000)	Area (1000 sq. ft.)
Orleans	0	0	0	0
Oswego	0	0	0	0
Otsego	0	0	0	0
Putnam	1	3	5,000	60
Queens	1,091	1,938	3,425,029	28,547
Rensselaer	17	172	128,690	1,141
Rockland	10	68	76,750	1,330
Saratoga	28	251	236,474	3,284
Schenectady	14	46	35,637	358
Scholarie	0	0	0	0
Schuyler	0	0	0	0
Staten Island	64	83	163,586	1,395
Steuben	1	1	7,000	20
Suffolk	34	333	316,048	3,437
Sullivan	6	105	34,625	431
Tioga	0	0	0	0
Tompkins	10	38	103,600	585
Ulster	9	76	42,950	343
Warren	10	45	13,055	188
Washington	0	0	0	0
Wayne	2	4	9,000	57
Westchester	38	183	480,514	4,204
Wyoming	0	0	0	0
Yates	1	6	2,800	36

**Table D-16. Multifamily New Construction and Renovation Buildings by Stories Class and County (2004-2012)**

Source: McGraw Hill Dodge Players Reports 2004-2012

County	Missing	1 to 3	4 to 5	6 to 10	11 to 20	More than 20	Total
Albany	14	156	34	0	0	0	204
Allegany	1	1	0	0	0	0	2
Bronx	153	1,234	268	233	57	2	1,947
Brooklyn	1,526	1,859	1,394	619	110	68	5,576
Broome	1	28	1	0	0	0	30
Cattaraugus	13	137	15	2	0	0	167
Cayuga	0	0	0	0	0	0	0
Chautauqua	0	46	7	0	0	0	53
Chemung	0	1	0	0	0	0	1
Chenango	0	0	0	0	0	0	0
Clinton	0	3	4	0	0	0	7
Columbia	0	7	0	0	0	0	7
Cortland	0	11	2	0	0	0	13
Delaware	0	4	0	0	0	0	4
Dutchess	0	567	0	0	1	0	568
Erie	61	188	18	1	1	0	269
Essex	0	9	0	0	0	0	9
Franklin	0	3	0	0	0	0	3
Fulton	1	6	0	0	0	0	7
Genesee	1	0	0	0	0	0	1
Greene	0	0	0	0	0	0	0
Hamilton	0	0	0	0	0	0	0
Herkimer	0	0	0	0	0	0	0
Jefferson	15	113	0	0	0	0	128
Lewis	0	0	0	0	0	0	0
Livingston	0	16	0	0	0	0	16
Madison	0	10	0	0	0	0	10
Manhattan	1,539	100	559	795	1,241	464	4,698
Monroe	119	374	5	1	0	0	499
Montgomery	0	7	0	0	0	0	7
Nassau	31	79	5	2	3	0	120
Niagara	0	100	0	0	0	0	100
Continued							

County	Missing	1 to 3	4 to 5	6 to 10	11 to 20	More than 20	Total
Oneida	0	27	0	0	0	0	27
Onondaga	92	92	1	0	0	0	185
Ontario	0	151	0	0	0	0	151
Orange	17	336	0	0	0	0	353
Orleans	0	0	0	0	0	0	0
Oswego	9	0	0	0	0	0	9
Otsego	0	0	0	0	0	0	0
Putnam	0	3	0	0	0	0	3
Queens	199	1,286	634	223	51	18	2,411
Rensselaer	8	176	3	0	0	0	187
Rockland	78	133	10	5	7	3	236
Saratoga	16	56	0	1	0	0	73
Schenectady	12	219	24	3	0	0	258
Schoharie	3	43	1	0	0	0	47
Schuyler	0	0	0	0	0	0	0
Seneca	0	0	0	0	0	0	0
St Lawrence	0	0	0	0	0	0	0
Staten Island	78	133	10	5	7	3	236
Steuben	0	1	0	0	0	0	1
Suffolk	36	302	2	0	0	0	340
Sullivan	0	104	0	1	0	0	105
Tioga	0	0	0	0	0	0	0
Tompkins	0	31	7	1	0	0	39
Ulster	39	38	0	0	0	0	77
Warren	10	44	2	3	0	0	59
Washington	0	0	0	0	0	0	4
Wayne	0	4	0	0	0	0	4
Westchester	17	146	14	7	7	4	195
Wyoming	0	0	0	0	0	0	0
Yates	0	6	0	0	0	0	6
<b>Total</b>	<b>4,089</b>	<b>8,390</b>	<b>3,020</b>	<b>1,902</b>	<b>1,485</b>	<b>562</b>	<b>19,452</b>

**Table D-17. MPP Participation as a Percentage of Multifamily Properties by County (2012)**

In the table, the term “MPP Properties Participants” refers to the number of properties that participated in MPP. MPP participation as a percentage of properties is calculated as the number of MPP Property Participants by county, divided by the total number of multifamily properties in the county.

Sources: CRIS Database 3/5/2013, PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department 2004-2012

County	MPP Properties Participants	MPP Participation as a Percentage of Properties
Albany	16	2%
Allegany	0	0%
Bronx	152	2%
Brooklyn	133	1%
Broome	6	1%
Cattaraugus	3	1%
Cayuga	1	1%
Chautauqua	4	1%
Chemung	4	2%
Chenango	0	0%
Clinton	0	0%
Columbia	3	2%
Cortland	1	1%
Delaware	0	0%
Dutchess	17	1%
Erie	82	2%
Essex	1	1%
Franklin	6	6%
Fulton	0	0%
Genesee	2	2%
Greene	0	0%
Hamilton	0	0%
Herkimer	4	4%
Jefferson	9	3%
Lewis	1	3%
Livingston	2	2%
Madison	2	2%
Manhattan	236	1%
Monroe	43	3%
Montgomery	1	1%
Continued		

County	MPP Properties Participants	MPP Participation as a Percentage of Properties
Nassau	2	0%
Niagara	21	2%
Oneida	7	1%
Onondaga	65	4%
Ontario	3	1%
Orange	9	1%
Orleans	1	1%
Oswego	6	3%
Otsego	1	1%
Putnam	0	0%
Queens	65	1%
Rensselaer	4	0%
Rockland	6	0%
Saratoga	6	1%
Schenectady	2	1%
Schoharie	0	0%
Schuyler	0	0%
Seneca	2	4%
St. Lawrence	6	3%
Staten Island	8	1%
Steuben	4	3%
Suffolk	1	0%
Sullivan	6	1%
Tioga	0	0%
Tompkins	9	2%
Ulster	6	1%
Warren	1	1%
Washington	0	0%
Wayne	1	1%
Westchester	75	0%
Wyoming	0	0%
Yates	0	0%



**Table D-18. MPP Participation as a Percentage of Multifamily Buildings by County (2012)**

In the table, the term “MPP Building Participants” refers to the number of participating buildings. The MPP participation as a percentage of buildings is calculated as the number of participating buildings, divided by the total number of multifamily buildings in each county.

Sources: CRIS Database 3/5/2013, PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2012, March)

County	MPP Building Participants	MPP Participation as a Percentage of MF Buildings
Albany	91	6%
Allegany	0	0%
Bronx	324	3%
Brooklyn	238	1%
Broome	9	1%
Cattaraugus	31	10%
Cayuga	1	1%
Chautauqua	13	2%
Chemung	63	29%
Chenango	0	0%
Clinton	0	0%
Columbia	15	8%
Cortland	8	4%
Delaware	0	0%
Dutchess	71	2%
Erie	520	10%
Essex	1	1%
Franklin	13	11%
Fulton	0	0%
Genesee	5	4%
Greene	0	0%
Hamilton	0	0%
Herkimer	20	15%
Jefferson	159	38%
Lewis	20	45%
Livingston	2	1%
Madison	14	9%
Manhattan	428	2%
Monroe	328	11%
Montgomery	19	13%
Continued		

County	MPP Building Participants	MPP Participation as a Percentage of MF Buildings
Nassau	29	1%
Niagara	161	15%
Oneida	88	11%
Onondaga	314	13%
Ontario	16	3%
Orange	29	2%
Orleans	1	1%
Oswego	8	3%
Otsego	1	0%
Putnam	0	0%
Queens	222	1%
Rensselaer	129	14%
Rockland	28	0%
Saratoga	12	1%
Schenectady	15	3%
Schoharie	0	0%
Schuyler	0	0%
Seneca	2	3%
St. Lawrence	48	15%
Staten Island	13	0%
Steuben	11	5%
Suffolk	5	0%
Sullivan	23	2%
Tioga	0	0%
Tompkins	35	6%
Ulster	25	3%
Warren	1	0%
Washington	0	0%
Wayne	1	0%
Westchester	251	1%
Wyoming	0	0%
Yates	0	0%

## Appendix E. Census New Construction Data

**Table E-1. Multifamily Permits by Number of Units, Number of Buildings, and Value of Construction by Year (1960-2013)**

Source: U.S. Census Building Permits Survey (1960-2013)

Year	Total Units	Total Buildings	Valuation of Construction (\$1,000)
1960	36,756		\$329,546
1961	57,343		\$516,334
1962	61,437		\$604,117
1963	45,125		\$423,578
1964	19,026		\$171,265
1965	29,917		\$302,386
1966	26,850		\$274,958
1967	29,042		\$275,431
1968	34,101		\$364,469
1969	28,431		\$312,448
1970	34,647		\$603,455
1971	53,444		\$888,957
1972	62,189		\$1,108,402
1973	36,237		\$705,866
1974	20,652		\$414,505
1975	5,556		\$84,206
1976	3,891		\$64,148
1977	10,333		\$205,860
1978	16,063		\$331,250
1979	11,523		\$245,346
1980	7,540	296	\$253,977
1981	9,199	386	\$281,067
1982	9,577	388	\$374,388
1983	13,106	500	\$415,008
1984	12,259	509	\$665,580
1985	21,761	864	\$1,234,878
1986	11,926	839	\$560,331
1987	13,584	724	\$928,227
Continued			
1988	11,471	755	\$545,587
1989	11,298	592	\$659,319

Year	Total Units	Total Buildings	Valuation of Construction (\$1,000)
1990	6,460	314	\$420,313
1991	3,546	219	\$237,623
1992	3,630	271	\$151,085
1993	4,116	218	\$181,121
1994	5,273	365	\$229,188
1995	4,791	292	\$216,527
1996	10,420	498	\$475,716
1997	9,449	379	\$453,304
1998	10,995	472	\$612,226
1999	12,025	645	\$670,134
2000	13,276	548	\$891,986
2001	13,697	594	\$935,652
2002	14,841	671	\$1,070,988
2003	16,286	786	\$1,239,454
2004	18,167	737	\$1,353,390
2005	26,488	1,135	\$1,955,730
2006	24,348	880	\$1,977,659
2007	29,488	896	\$2,697,628
2008	35,696	1,144	\$3,184,330
2009	6,937	294	\$741,283
2010	7,665	313	\$764,482
2011	11,978	479	\$1,097,044
2012	13,891	576	\$1,330,359
2013	21,669	920	\$2,025,974