



**NYSERDA**

# **NYSERDA Residential Statewide Baseline Study**

**Volume 2: Multifamily Report**

**Final Report**

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# **NYSERDA Residential Statewide Baseline Study**

## **Volume 2: Multifamily Report**

*Final Report*

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## Notice

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## Abstract for Volume 2

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Volume 2 presents the multifamily findings from the statewide residential baseline study that was conducted from 2011–2014. The study included the single-family and multifamily residential housing segments, including new construction, and a broad range of energy uses and efficiency measures. The overall objective of the study is to understand the residential building stock and associated energy use, including the saturations of energy-consuming equipment (electric, natural gas, and other fuels) and the penetrations of energy efficient equipment, building characteristics, and energy management practices. The study also collected customer household and demographic information that can be correlated with energy usage features. This information will be used to establish more accurate baselines for calculating program energy savings and to support program planning in New York State. The residential baseline study conducted data collection on multifamily tenant units and buildings, including common area equipment for the three climates zones of New York State. Data were first collected via 379 Web or telephone surveys with tenants that were used to help identify multifamily property managers or owners. A total of 219 telephone surveys were then conducted with the property managers or owners. These surveys were followed by on-site inspection and data collection at 67 multifamily buildings. The results of the residential baseline study are presented in five volumes of reports. Multifamily is the second volume of the five.

## Keywords

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Energy efficiency, multifamily homes, market characterization, baseline study

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# 1 Introduction

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## 1.1 Background and Study Objectives

In 2011 through 2014, the New York State Energy Research and Development Authority (NYSERDA), in collaboration with the E2 Working Group<sup>1</sup> Statewide Study Subcommittee led by the New York State Department of Public Service (DPS), conducted a residential statewide baseline study. The NYSERDA evaluation group, in coordination with the lead contractor of this study, Tetra Tech MA, Inc. (Tetra Tech), and its subcontractors, Performance Systems Development (PSD), and GDS Associates, Inc. (GDS), developed and implemented a detailed work plan to complete this study.

The study included single-family and multifamily residential housing segments and a broad range of energy uses and efficiency measures. The overall objective of the study is to understand the residential building stock and associated energy use, including the saturations of energy-consuming equipment (electric, natural gas, and other fuels) and the penetrations of energy efficient equipment, building characteristics, and energy management practices. The study also collected customer household and demographic information that can be correlated with energy usage features.

Residential energy users throughout New York State were included in the scope of this study. Random samples were drawn individually by each of the major electric utilities' from their residential accounts. Those utility samples represented 90 percent of the State's residential households—most of the remaining 10 percent are served by municipal and cooperative utilities. Samples were designed to ensure some representation in each of the 10 Economic Development Regions, and to meet 90/10 confidence level statewide and for the three climate zones for most data collection activities. One exception was multifamily on-site inspections where the sample size was designed to achieve a 90/10 confidence/precision statewide, and not at the climate zone level due to technical barriers, costs, and difficulty in engaging the key decision makers. Multifamily tenant surveys and property manager and owner surveys were also conducted that would meet the climate zone 90/10 confidence/precision level for multifamily sector analysis. Having robust sample sizes at the climate zone was important to identify

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<sup>1</sup> Prior to the creation of the E2 Working Group, the former Evaluation Advisory Group held a similar role on this study.

differences that should be considered in program planning and to calculate more accurate energy savings for the potential analysis and future program evaluations. In particular, climate zone 4 is aligned to the Downstate region of New York State and has some very distinct differences from Upstate New York represented by climate zones 5 and 6.

The information gleaned from this study will be used by NYSERDA, DPS, New York program administrators, and other stakeholders to set more accurate baselines for evaluation purposes and help inform program planning.

The project has three main components:

- **Residential Baseline Study.** The evaluation team conducted a comprehensive statewide baseline study of the residential market across a broad range of customer segments and energy measures, including (1) new and existing single family buildings (one to four units), and (2) new and existing multifamily buildings (five units or more), including dwelling units, common areas, and whole buildings. Data were first collected through a combination of Web and telephone surveys. On-site inspection data collection was then completed for a sample of the Web and telephone survey respondents along with residential contact sample lists from other sources as described in the methodology volume.
- **HVAC Market Assessment.** Data were collected in baseline study surveys and on-site inspections, contractor interviews, and distributor sales reports to assess the market for non-electric heating, air conditioning, and water heating equipment. Data on the baseline efficiency of new equipment installed in New York State were gathered during HVAC contractor interviews and from D&R International (D&R) which reported New York State-specific Heating, Air-conditioning and Refrigeration Distributors International (HARDI) sales data for 2013. This information will be used to set more accurate baselines for calculating program energy savings.
- **Residential Potential Study.** The data for the baseline analysis and the HVAC market assessment were then used for the potential analysis. The analysis identified the technical, economical, and achievable residential energy efficiency opportunities in New York over the next three and five years, (2016 and 2018, respectively), relative to base year 2013.

The NYSERDA evaluation group, in coordination with the lead contractor of this study, Tetra Tech MA, Inc. (“Tetra Tech”) and its subcontractors, Performance Systems Development, (“PSD”) and GDS Associates, Inc. (“GDS”), developed a detailed work plan that was updated during the project. There are five volumes for the Residential Baseline Study. This second volume provides the highlights of the residential baseline study for the multifamily home segment. The other volumes describe the single-family baseline results (Volume 1), HVAC market assessment (Volume 3), potential analysis (Volume 4), and methodology and data tables (Volume 5).

## 1.2 Methodology

The methodology for the entire residential statewide baseline study is in Volume 5 (Methodology and Data Tables). This section summarizes the methodology, data comparisons, and data weighting for the multifamily component. The sample of tenants for the multifamily baseline study was primarily populated from the random sample of residential electric utility accounts provided by each of the electric utilities in New York State. Multifamily homes, for purposes of this study, were defined as two types:

- Low-rise multifamily: five or more units and three stories or less.
- High-rise multifamily: five or more units with four stories or more.

Master-metered buildings were excluded from this study because these buildings are more closely aligned with commercial buildings and the associated energy usage characteristics. It is important to note that the definitions used for this study most closely aligned with those used for code enforcement and NYSERDA staff for multifamily programs. Other data sources from the U.S. Census, including American Community Survey and Residential Energy Consumptions survey, included master-metered buildings. In addition, the data was typically collected from the occupants in tenant units and not for the multifamily building. The use of multifamily occupant survey data from the U.S. Census was a concern in making comparisons to the residential baseline study results for heating and cooling systems. The multifamily U.S. Census data does not differentiate between central building systems and individual tenant unit systems. In addition, other sources for multifamily data were only available at the national level and did not provide New York State data and did not provide definitions of multifamily in terms of number of units. Age of building was the one factor that could be used directly for comparison and there was a close match, within two percentage points.

The residential baseline study had a specific definition for the multifamily population and the survey data was weighted according to New York State data on the number of multifamily units in counties. The sample data by county was rolled up to climate zone. It is a geographic weighting, which is all that can be done without comparable data from other sources to be used for weighting.

Although lacking the ability to confirm the multifamily data with other sources, the survey team followed a very rigorous process in working the list of property managers and owners that started from the tenant accounts pulled in the random draw from the utility records. In many cases, up to 20 attempts were made before dropping the property manager or owner from the list. A rigorous survey process is not the total answer but it is a best practice to reducing self-selection bias in the telephone surveys without comparable data for post-weighting.

One survey instrument was developed and implemented for both single-family homeowners or occupants, and multifamily tenants. Based on responses to the single-family and tenant telephone and Web survey, people whose home fit the definition of multifamily for this study were asked for contact information for their property owner or facilities manager. Property owner or managers from the tenant contacts, as well as contact information identified through Internet research were then asked to complete a telephone survey. The survey also asked about their willingness to participate in on-site inspection data collection at their multifamily building, thus creating a nested sample that began with the single-family and tenant telephone and Web surveys.

Table 1 shows the number of surveys and on-site inspections completed with tenants and property managers or owners by climate zone. The on-site inspection data collection included common areas and tenant units. For existing multifamily buildings, data were collected for an average of five tenant units per building. Statewide results and climate zones 4 and 5 all meet the 90/10 confidence and precision with 68 or more completed surveys. Climate zone 6, which includes 5 percent of the total multifamily buildings in New York State, meets a 90/15 confidence and precision with 31 completed property manager and owner surveys and 90/12.5 with 47 tenant surveys.

**Table 1. Completed Multifamily Tenant and Property Manager or Owner Surveys by Climate Zone**

| Data Source                                 | Climate Zone   |                |                | Total |
|---------------------------------------------|----------------|----------------|----------------|-------|
|                                             | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 |       |
| Phone complete                              | 83             | 32             | 13             | 128   |
| Web complete                                | 168            | 49             | 34             | 251   |
| Total tenant surveys                        | 251            | 81             | 47             | 379   |
| Property owner or manager telephone surveys | 120            | 68             | 31             | 219   |

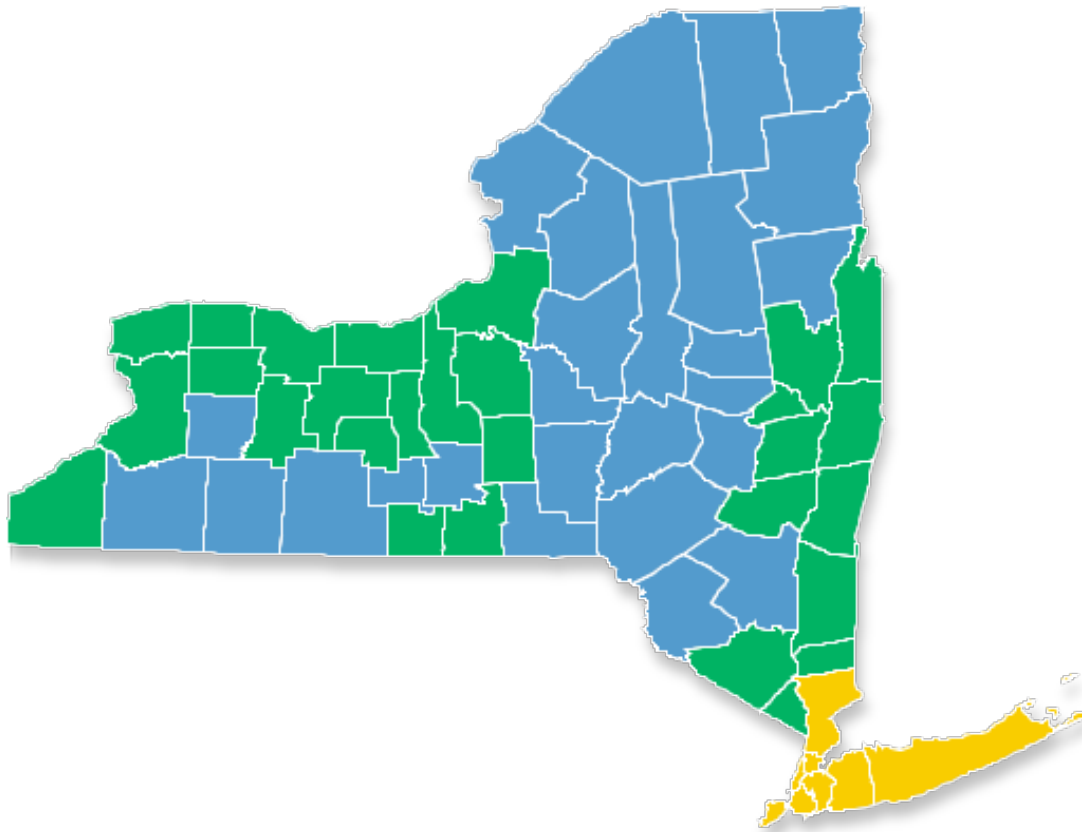
Table 2 summarizes the completed telephone and Web surveys and on-site inspection data collection by timeframe of construction (new and existing) and by climate zone. There were 11 tenants in new construction buildings that completed a telephone or Web survey. The 67 completed on-site inspections include eight new construction multifamily buildings (built 2012 and later) with 33 tenant units inspected in new construction. The multifamily building on-site inspections include data collected from 305 tenant units that were inspected although some tenant units did not provide energy consumption data and were not counted as a completed on-site inspection. Given the small number of new construction multifamily completions, the data is weighted and only reported for buildings and tenant units statewide. Data for the 67 on-site inspections meets the 90/10 confidence and precision statewide. Where possible, based on the number of data points, the results are presented by climate zone as described in Figure 1 and Table 3.

**Table 2. Completed Multifamily Property Owner or Manager Surveys and On-site Inspections by Construction Age and Climate Zone**

| Climate Zone   | Tenant Web or Telephone Surveys     |                                   |                   | Multifamily Building Surveys and On-site Inspections |                                                                           |                                                                        |
|----------------|-------------------------------------|-----------------------------------|-------------------|------------------------------------------------------|---------------------------------------------------------------------------|------------------------------------------------------------------------|
|                | Existing Construction (before 2012) | New Construction (2012 and after) | Overall Statewide | Property Owner or Manager Surveys                    | New and Existing Construction Multifamily Tenant Unit On-site Inspections | New and Existing Construction Multifamily Building On-site Inspections |
| Climate zone 4 | 249                                 | 2                                 | 251               | 120                                                  | 149                                                                       | 35                                                                     |
| Climate zone 5 | 74                                  | 7                                 | 81                | 68                                                   | 99                                                                        | 22                                                                     |
| Climate zone 6 | 45                                  | 2                                 | 47                | 31                                                   | 57                                                                        | 10                                                                     |
| Total state    | 368                                 | 11                                | 379               | 219                                                  | 305                                                                       | 67                                                                     |

**Figure 1. Climate Zone Map of New York State**

Colors on the map correspond to climate zones shown in Table 3.



**Table 3. Climate Zones by County of New York State**

Source: <http://energycode.pnl.gov/EnergyCodeReqs/?state=New%20York>

| Climate Zone 4 |            |              |             |
|----------------|------------|--------------|-------------|
| Bronx          | Nassau     | Queens       | Suffolk     |
| Kings          | New York   | Richmond     | Westchester |
| Climate Zone 5 |            |              |             |
| Albany         | Erie       | Ontario      | Saratoga    |
| Cayuga         | Genesee    | Orange       | Schenectady |
| Chautauqua     | Greene     | Orleans      | Seneca      |
| Chemung        | Livingston | Oswego       | Tioga       |
| Columbia       | Monroe     | Putnam       | Washington  |
| Cortland       | Niagara    | Rensselaer   | Wayne       |
| Dutchess       | Onondaga   | Rockland     | Yates       |
| Climate Zone 6 |            |              |             |
| Allegany       | Franklin   | Montgomery   | Sullivan    |
| Broome         | Fulton     | Oneida       | Tompkins    |
| Cattaraugus    | Hamilton   | Otsego       | Ulster      |
| Chenango       | Herkimer   | Schoharie    | Warren      |
| Clinton        | Jefferson  | Schuyler     | Wyoming     |
| Delaware       | Lewis      | St. Lawrence |             |
| Essex          | Madison    | Steuben      |             |

### 1.3 New York State Statistics

Table 4 and Table 5 show the total multifamily properties, buildings, and tenant units in New York State by region and by climate zone. Statewide, there are an average of almost 1.3 buildings at each multifamily property and an average of 14.4 tenant units in each multifamily building, with New York City having the highest with 21.7 tenant units per building. The New York City Region has about half of the multifamily properties but even more, 85 percent, of the multifamily tenant units in New York State. Climate zone 4, which includes New York City and Long Island Regions, and Westchester County, represents about 75 percent of the multifamily buildings in the state and about 88 percent of the tenant units. To ensure statewide representation, the sampling strategy recognized the proportions by climate zone by including more completes in climate zone 4, while ensuring there was sufficient representation in all three climate zones.

**Table 4. Multifamily Property Information by Region (2012)**

Source: Summarized by Region from the NYSEDA *Multifamily Performance Program/Process Evaluation and Market Characterization/2010-2014 Final Report*. Table D-4 Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (March 2013)

| Region                   | Total Living Area (sq. ft.) | Number of Multifamily Buildings | Number of Multifamily Properties | Number of Tenant Units | Average Number of Tenant Units/ Building |
|--------------------------|-----------------------------|---------------------------------|----------------------------------|------------------------|------------------------------------------|
| Capital District         | 32,521,121                  | 5,199                           | 3,703                            | 44,490                 | 8.6                                      |
| Central New York         | 21,513,265                  | 3,152                           | 2,436                            | 39,111                 | 12.4                                     |
| Finger Lakes             | 36,370,272                  | 4,283                           | 2,649                            | 67,200                 | 15.7                                     |
| Long Island              | 7,699,835                   | 9,093                           | 8,921                            | 7,422                  | 0.8                                      |
| Mid-Hudson               | 87,698,342                  | 39,696                          | 38,116                           | 97,656                 | 2.5                                      |
| Mohawk Valley            | 8,833,895                   | 1,495                           | 1,160                            | 12,174                 | 8.1                                      |
| New York City            | 1,983,285,763               | 95,853                          | 66,471                           | 2,081,849              | 21.7                                     |
| North Country            | 7,792,524                   | 1,426                           | 946                              | 11,559                 | 8.1                                      |
| Southern Tier            | 16,369,189                  | 2,431                           | 1,807                            | 21,195                 | 8.7                                      |
| Western New York         | 32,291,899                  | 7,283                           | 6,282                            | 56,881                 | 7.8                                      |
| <b>Overall Statewide</b> | <b>2,234,376,105</b>        | <b>169,911</b>                  | <b>132,491</b>                   | <b>2,439,537</b>       | <b>14.4</b>                              |

**Table 5. Multifamily Property Information by Climate Zone (2012)**

Source: Summarized by climate zone from the NYSEDA *Multifamily Performance Program/Process Evaluation and Market Characterization/2010-2014 Final Report*. Table D-4 Sources: PLUTO™ V12v2 ©NYC Department of City Planning, and New York State Tax Records from New York State Taxation and Finance Department (2013, March)

| Climate Zone             | Total Living Area (sq. ft.) | Number of Buildings | Number of Properties | Number of Units  |
|--------------------------|-----------------------------|---------------------|----------------------|------------------|
| Climate zone 4           | 2,053,349,471               | 130,221             | 100,473              | 2,151,695        |
| Climate zone 5           | 139,022,462                 | 31,619              | 26,136               | 230,102          |
| Climate zone 6           | 42,004,172                  | 8,071               | 5,882                | 57,740           |
| <b>Overall statewide</b> | <b>2,234,376,105</b>        | <b>169,911</b>      | <b>132,491</b>       | <b>2,439,537</b> |

## 1.4 Summary of Major Findings on the Multifamily Sector

The multifamily baseline study provides a wealth of information on the building, central systems, and tenant units and equipment. Key findings are presented in this report. This section highlights some of the major findings and what implications they may have for future programs when information is available to support those conclusions.

**Overall population:** The majority of multifamily buildings (about three-fourths) are located in climate zone 4, which includes New York City and Long Island Regions, and Westchester County. The percentage of tenant units in that climate zone is even higher with 88 percent. The largest opportunity for energy savings in the multifamily sector is also in climate zone 4.

**Multifamily building characteristics:** The multifamily buildings located in the three climate zones are each very different in their characteristics. In addition to having the largest percentage of multifamily buildings, climate zone 4 has by far the oldest and the largest buildings in terms of number of units, and the most central systems for heating, cooling, and water heating.

**Building age:** Close to 40 percent of multifamily buildings in climate zone 4 are more than 75 years old compared to less than nine percent of the buildings in the other two climate zones. Programs should consider ways to target older buildings in climate zone 4 with energy efficiency measures. At the same time, multifamily programs should recognize that while low rise buildings may fit the definition of multifamily, they are quite different in terms of what end uses may be within the tenant unit versus central systems for the building.

**Heating equipment:** Approximately three-fourths (73 percent) of multifamily buildings have central heating systems that supply tenant units. The majority are central boiler systems. The central heating systems are primarily fueled with natural gas (62 percent) and fuel oil (26 percent). About one-quarter of the natural gas central heating systems are over 20 years old, and could be replaced with newer, more efficient systems. Heating equipment in tenant units that are not supplied by central systems is primarily fueled by natural gas (50 percent) and electricity (44 percent).

**Cooling equipment:** Statewide, 94 percent of the tenants report that their unit contains some type of air conditioning system; 78 percent have room or window air conditioning, nine percent have central air conditioners, and seven percent receive air conditioning from a building central cooling system. Air conditioning is most prevalent in climate zone 4 (96 percent), and least prevalent in climate zone 6 (69 percent). Because 69 percent of property owners or managers say they provide no air conditioning to tenants, many tenants provide their own equipment. The age of the equipment in tenant units vary with newer equipment (mostly room and window air conditioning) reported for climate zone 4—almost one-quarter is less than 2 years old.

**Water heating equipment:** Natural gas is used for most water heating systems in both tenant units and central systems (over 60 percent), with the remainder being primarily electric water heating, according to the property manager and owner surveys. Eighty-six percent of property owners and managers surveyed report that their building contains a central water heating system. These central water heating systems are much more prevalent in climate zone 4 (93 percent). Central water heating systems in climate zone 4 are more likely to use fuel oil (over a third of the central systems) than the other two climate zones. In addition, many of the Climate zone 4 central water heating systems are part of the heating system boiler (74 percent). Climate zone 4 has the oldest central water heating systems as well with 32 percent being over 20 years old, thus offering opportunities for more energy savings through equipment replacements.

**Lighting equipment:** Property managers or owners report that over half of the lighting in common areas is either compact fluorescent lights (CFLs; 45 percent) or light-emitting diodes (LEDs; 11 percent), with climate zone 4 having slightly more LED lighting (12 percent) in those areas than the other two climate zones. At the same time, tenants report having an average of two incandescent lights (or about one-third of the lights) used more than two hours per day. A multifamily program that targets tenant unit lighting could result in substantial energy savings.

**Appliances:** According to tenants, less than 50 percent of tenant unit refrigerators and dishwashers that are less than 10 years old are reported as ENERGY STAR®. At the same time, the analysis of surveys and on-site inspections for single family found that the survey respondents tend to over-state the proportion of ENERGY STAR with actual observations showing 30 to 50 percent less ENERGY STAR appliances in the on-site inspection data. Over 20 percent of all appliances types are over 10 years old. About one-quarter of the tenant units use electricity for cooking, while 73 percent use natural gas. The presence of natural gas in the home for cooking does not influence the type of clothes dryers. Over three-quarters (77 percent) of the clothes dryers in tenant units are reported as being electric. Sixty-seven percent of property owners or managers report having a common area laundry in their building. Opposite to the high proportion of tenant units' electric dryers, 68 percent of common area dryers are fueled with natural gas.

**Computers:** Most tenants report having approximately two computers that are used three to four hours per day. Only half of the computers are turned off when not in use. Fourteen percent of tenants say they use a smart strip to power off computers, printers, and other equipment after periods of inactivity. Given that one out of two tenants on average have multifunction devices (printer/copier/scanner/fax combined), it would be useful to provide more education to tenants on the energy consumption of plug loads and phantom loads that occurs even when the equipment is powered off. In addition, there are opportunities to promote the use of smart strips in tenant units along with more efficient appliances.

**Televisions and other electronics:** Tenant units typically have about 1.6 televisions for an average of about two occupants per tenant unit. The majority of televisions are flat screen LCD/LED (an average of 0.9 per tenant unit). Among LCD/LED and plasma TVs, over two-thirds of tenants indicate the LCD/LEDs to be ENERGY STAR rated. On average, at least one out of every two tenants housing units have DVD/Blu-Ray players, cable/satellite/set top boxes, cell phones and smart phones, cordless phones, and stereo systems.

**Other common area equipment:** About one-third of low rise buildings and buildings in climate zone 5 reported having swimming pools with 40 percent of them being heated. Statewide, the majority of those heated pools (69 percent) were reported as having high efficiency pool pumps. At the same time, there are still over 30 percent that could be targeted for high efficiency pool pumps in a multifamily program. About 24 percent of property owners or managers report having a common area exercise room. Common area exercise rooms are more common in low rise buildings (34 percent versus 20 percent of high rise).

**Energy efficiency program awareness:** Very few tenants (7.6 percent) reported participating in an energy efficiency program. Those tenants who participated most frequently installed lighting (52 percent), air conditioning (27 percent), and insulation or weatherization (20 percent). The most frequently cited reasons tenants mentioned for not participating were lack of awareness (53 percent), the fact that they rent (46 percent), and low energy bills (16 percent). Sixty-five percent of property owners or managers report being aware of energy efficiency programs offered to multifamily properties (65 percent aware in climate zones 4 and 5 and 57 percent aware in climate zone 6). Those property owners or managers who were aware of energy efficiency programs were asked if they had participated in a program in the last five years, and if not, why not. Two-thirds of aware property owners reported participating in a program. Of people who have participated, 40 percent report participating in a lighting program, 15 percent report participating in a multifamily performance program, and 14 percent report converting to natural gas. Participation was for multifamily programs administered by NYSERDA and by the utilities.

## 2 Key Findings

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### 2.1 Profiles of Typical New York State Multifamily Homes

#### 2.1.1 Multifamily Buildings

The individually metered multifamily building population has distinct differences by climate zone. Climate zone 4 has the oldest buildings, the largest buildings based on number of tenant units, the most buildings that also have businesses in the building, and the most central systems for heating, cooling, and water heating. Climate zone 6 has the newest buildings, the smallest buildings in terms of number of tenant units, and the fewest central systems for heating and cooling tenants in the building. The U.S. Census data for age of multifamily units was very similar statewide at 34.0 percent compared to 32.2 percent reported by property managers and owners.

The U.S. Census data for all homes in New York State was close to the baseline survey results for multifamily central building system primary heating fuel as well. The U.S. Census for all homes reported 54.9 percent natural gas and 28.8 percent fuel oil for primary heating fuels, while the multifamily central building systems used for heating were 65.1 percent for natural gas (with more natural gas available in areas where multifamily building are located), and 26.2 percent fuel oil (Table 6).

Table 7 shows approximately 90 percent of property owners and managers indicated that their organization owns or manages other properties in New York. There was not much of a variation between the climate zones. High rise buildings were more likely than low rise buildings to own or manage other buildings (91.9 percent to 85 percent, respectively).

**Table 6. Typical Multifamily Buildings Profile**

Source: Multifamily Property Owner or Manager Survey; \*2009 RECS, 2009-2013 American Community Survey 5-Year Estimates. Note that one building in climate zone 4 has more than 8,000 units, which increases the overall average units substantially.

| Category                                                          | Climate Zone 4  | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or less Stories | High Rise - 4 or more stories | Overall Statewide       |
|-------------------------------------------------------------------|-----------------|----------------|----------------|------------------------------|-------------------------------|-------------------------|
| Age of buildings—most prevalent age of buildings                  | 1939 or earlier | 1970 to 1979   | 1980 to 1989   | 1970 to 1979                 | 1939 or earlier               | 1939 or earlier (32.2%) |
| Average number of stories                                         | 8.5             | 2.8            | 2.8            | 2.3                          | 9.4                           | 7.2                     |
| Average number of buildings at site                               | 4.8             | 18.3           | 10.1           | 16.7                         | 3.6                           | 7.6                     |
| Average number of units at site                                   | 251.3           | 183.2          | 77.0           | 195.5                        | 245.7                         | 230.3                   |
| Average occupancy percentage of units                             | 97.2%           | 94.1%          | 93.4%          | 95.4%                        | 96.9%                         | 96.5%                   |
| Percentage of tenants in buildings with businesses (stores, etc.) | 29.2%           | 7.4%           | 16.1%          | 4.6%                         | 33.3%                         | 24.5%                   |
| Percentage of central heating system for building                 | 81.7%           | 47.1%          | 38.7%          | 45.4%                        | 85.5%                         | 73.2%                   |
| Percentage of central air conditioning system for building        | 6.7%            | 1.5%           | 0%             | 3.0%                         | 6.4%                          | 5.4%                    |
| Percentage of central water heating system for building %         | 93.3%           | 61.2%          | 56.7%          | 58.6%                        | 97.5%                         | 85.6%                   |

**Table 7. Own or Manage other Properties in NY by Climate Zone and Rise**

Totals may not sum to 100 percent due to rounding. Note that climate zone 6 with a sample size of 31 respondents meets 90/15, but not 90/10 confidence/precision.

Source: Property owner/manager survey questions S4

|                 | Climate zone   |                |                | Low or high rise             |                               | Overall Statewide |
|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Yes             | 89.9%          | 88.1%          | 90.3%          | 85.0%                        | 91.6%                         | 89.6%             |
| No              | 10.1%          | 11.9%          | 9.7%           | 15.0%                        | 8.4%                          | 10.4%             |
| Respondents (n) | 119            | 67             | 31             | 102                          | 115                           | 217               |

### **2.1.2 Multifamily Tenant Units**

There are less distinct differences in tenant units by climate zone and high-rise or low-rise buildings. The majority of the tenant units (over 90 percent) are less than 1,500 square feet. Tenant units typically average about two occupants, except in climate zone 5, where they reported an average of 1.5 occupants per unit (Table 8).

As is common in a study of this type, some respondent demographic variables, most notably education level, differed from the overall population demographics. Each of these differences was thoroughly examined by the study team in order to investigate the level of potential bias and whether weighting would be appropriate.

Differences in the sample vs. population demographics that existed could not be conclusively identified nor appropriately corrected for in weighting, so no such adjustments were made in the results. The study team believes that some of the observed difference could be explained by the varied ways in which data were collected for this study and the population benchmark studies. For example, this study estimates that 41.2 percent of households or building units have at least one household member with a graduate degree. In comparison, about 14.5 percent of individuals directly responding to the Census surveys have graduate degrees themselves. The large difference may reflect survey bias, or it may simply reflect that this study is measuring the highest level of education across all household members while the Census is measuring highest level of education of a single individual.

Furthermore, many of the demographic variables that differed between the sample and the population are characteristic of the respondent rather than the building or household, which was the unit of analysis in this study. Key characteristics of buildings within this study sample, namely age of home, primary heating fuel, square footage, number of bedrooms, number of occupants, and average annual fuel use compare closely with population benchmark sources, and strongly support this study's representativeness of NYS residential building stock.

Through identifying and analyzing these differences, the study team has noted improvements to be made if this study is repeated in the future, to better isolate true differences between the sample and the population and aide in weighting if needed.

**Table 8. Typical Multifamily Tenant Unit Profile***Source: Tenant Surveys*

| Category                                                      | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise Buildings | High Rise Buildings | Overall Statewide |
|---------------------------------------------------------------|----------------|----------------|----------------|--------------------|---------------------|-------------------|
| Square footage of unit—percentage less than 1,500 square feet | 91.4%          | 91.3%          | 100%           | 89.3%              | 92.6%               | 91.8%             |
| Average number of bedrooms                                    | 1.4            | 1.6            | 1.8            | 1.7                | 1.3                 | 1.4               |
| Average number of occupants                                   | 2.1            | 1.5            | 2.2            | 2.1                | 2.0                 | 2.0               |
| Annual household Income (2012) - \$75,000 or more             | 48.0%          | 13.5%          | 17.0%          | 29.4%              | 46.7%               | 42.1%             |
| Household highest education level – graduate degree           | 44.1%          | 26.8%          | 26.8%          | 27.7%              | 45.6%               | 41.2%             |

## 2.2 Building Characteristics

Table 9 shows that property managers and owners surveys indicated the oldest multifamily buildings are in climate zone 4 with almost 40 percent built in 1939 or earlier. Climate zone 5 has somewhat newer multifamily buildings with 15 percent built in 2000 or later. While 43 percent of high-rise multifamily buildings were built before 1940, only 7 percent of low rise buildings were built during that time. The 2013 American Community Survey statistics for New York State were similar for most categories with 34 percent of multifamily (5 or more unit buildings) built in 1939 or earlier, and 22 percent in 1940-1959.

**Table 9. Types of Multifamily Buildings by Climate Zone and Rise**

Totals may not sum to 100 percent due to rounding. Note that climate zone sample sizes are smaller for climate zone 6, although meeting 90/15 confidence/precision, so comparisons by climate zone may not be reliable.

Source: Property owner/manager survey questions S17 and S13

| Year Built      | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| 1939 or earlier | 39.8%          | 8.8%           | 6.7%           | 7.4%                         | 43.1%                         | 32.2%             |
| 1940 to 1949    | 8.0%           | 2.9%           | 3.3%           | 2.4%                         | 8.7%                          | 6.8%              |
| 1950 to 1959    | 14.2%          | 8.8%           | 3.3%           | 8.3%                         | 14.5%                         | 12.6%             |
| 1960 to 1969    | 6.2%           | 13.2%          | 16.7%          | 15.4%                        | 4.8%                          | 8.1%              |
| 1970 to 1979    | 7.1%           | 26.5%          | 20.0%          | 28.9%                        | 3.8%                          | 11.5%             |
| 1980 to 1989    | 7.1%           | 16.2%          | 33.3%          | 17.0%                        | 7.1%                          | 10.1%             |
| 1990 to 1999    | 3.5%           | 8.8%           | 6.7%           | 8.3%                         | 3.1%                          | 4.7%              |
| 2000 to 2009    | 8.8%           | 11.8%          | 10.0%          | 10.3%                        | 9.1%                          | 9.5%              |
| 2010            | 3.5%           | 0%             | 0%             | 0%                           | 3.9%                          | 2.7%              |
| 2011            | 0.9%           | 0%             | 0%             | 0%                           | 1.0%                          | 0.7%              |
| 2012            | 0.9%           | 2.9%           | 0%             | 1.9%                         | 1.0%                          | 1.2%              |
| Respondents (n) | 113            | 68             | 30             | 100                          | 111                           | 211               |

In looking at the responses of the property managers or owners surveyed for low rise and high rise multifamily buildings, it is interesting that the portion of low rise and high rise buildings changes significantly over time. More high rise buildings than low rise buildings were built before 1960. Low rise buildings became more prevalent starting in 1960 and continuing until 2000. High rise buildings began gaining market share again starting in 2000 and dominated the multifamily construction in 2010 and 2011. The vast majority of tenants, at least 92 percent, report that their tenant unit is less than 1,500 square feet of floor space and 67 percent have less than 1,000 square feet. High rise units are more likely than low rise units to be less than 1,000 square feet (71 percent vs. 54 percent, respectively). Comparisons by climate zone are presented for information purposes but are less reliable at 90/13 confidence and precision for climate zone 6 due to the small sample size of 39 tenant units.

**Table 10. Square Footage of Tenant Units by Climate Zone**

Climate zone sample sizes are very small for climate zone 6 (at 90/13 confidence/precision) so comparisons by climate zone may not be reliable. Note that totals may not sum to 100 percent due to rounding.

Source: Tenant survey questions B5 and B5a

| Square Footage                       | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|--------------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                      | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Less than 1,000 square feet          | 68.8%          | 55.8%          | 70.1%          | 54.2%                        | 71.4%                         | 67.2%             |
| 1,000 to less than 1,500 square feet | 23.1%          | 36.8%          | 29.9%          | 35.9%                        | 21.7%                         | 25.1%             |
| 1,500 to less than 2,000 square feet | 5.7%           | 7.2%           | 0%             | 6.7%                         | 5.3%                          | 5.6%              |
| 2,000 to less than 2,500 square feet | 1.0%           | 0%             | 0%             | 1.6%                         | 0.5%                          | 0.8%              |
| 2,500 to less than 3,000 square feet | 0.5%           | .2%            | 0%             | 1.6%                         | 0%                            | 0.4%              |
| 3,000 to less than 4,000 square feet | 1.0%           | 0%             | 0%             | 0%                           | 1.0%                          | 0.8%              |
| Respondents (n)                      | 211            | 69             | 39             | 115                          | 204                           | 319               |

## 2.3 Energy Consumption by Household Age and Size

As shown in Table 11, tenant units most often fall into the 2,501 to 6,000 kilowatt-hour (kWh) category for annual electricity consumption based on the utility account data (47 percent of tenant units). An additional 41 percent fall into the 501 to 2,500 kWh category. As expected, those living in smaller tenant units average fewer occupants (about 1.5 occupants). Additionally, those living in smaller units have lower consumption levels even though most (94 percent) are year round occupants; 74 percent of those using less than 500 kWh or less live in units less than 1,000 square feet.

**Table 11. Annual Kilowatt-Hour Consumption of Tenant Units by Climate Zone and Rise**

Climate zone 6's smaller sample size would meet the 90/12 confidence/precision and not 90/10. Totals may not sum to 100 percent due to rounding.

*Source: Utility-provided kilowatt-hours*

| kWh Consumption      | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|----------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                      | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| 500 kWh or less      | 0.3%           | 1.4%           | 2.2%           | 1.6%                         | 0.1%                          | 0.5%              |
| 501 to 2,500 kWh     | 44.6%          | 21.9%          | 24.7%          | 26.3%                        | 45.8%                         | 41.0%             |
| 2,501 to 6,000 kWh   | 46.3%          | 54.8%          | 39.9%          | 47.6%                        | 46.9%                         | 47.1%             |
| 6,001 to 12,000 kWh  | 7.2%           | 21.9%          | 24.4%          | 22.9%                        | 5.4%                          | 9.7%              |
| 12,001 to 20,000 kWh | 1.6%           | 0%             | 6.6%           | 1.2%                         | 1.8%                          | 1.6%              |
| 20,000 kWh or more   | 0%             | 0%             | 2.2%           | 0.4%                         | 0%                            | 0.1%              |
| Respondents (n)      | 251            | 73             | 46             | 135                          | 235                           | 370               |

The sample was drawn primarily from tenant surveys that were samples from the utility residential accounts. Master-metered buildings would be more likely to show up in utility commercial accounts. There were some property manager or owner survey respondents that did indicate some master-metered buildings with submeters (shadow meters) for tenants—a little over 12 percent with more coming from high rise buildings as shown in Table 12. Of these property owners and managers that reported they have a master meter with submeter, about half of them were in New York City. Where the property manager and owners were identified from tenant surveys, these utility residential accounts were still in the typical range of 6,000 kWh or less for annual energy consumption for most of those tenants. Because the utility would typically bill for electric based on the master meter, this would indicate that close to half of the property owners and managers surveyed may not have correctly characterized the metering structure for their building.

Climate zone 6 (over 26 percent) and low rise buildings (about 13 percent) were the most likely of all multifamily segments to have all individually metered units with no master meters or common area meters.

**Table 12. Multifamily Building Electric Service Metering Configuration Reported by Property Managers and Owners**

Climate zone sample sizes are very small for climate zone 6 with about 90/15 confidence/precision while other categories are 90/10 or better. Totals may not sum to 100 percent due to rounding.

*Source: Property owner/manager survey questions S1a*

| Metering Reported by Property Managers and Owners                          | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|----------------------------------------------------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                                                            | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Individual metered plus separate meters for common area                    | 81.0%          | 76.5%          | 63.3%          | 79.1%                        | 79.4%                         | 79.3%             |
| Master meter for total building plus sub-meter for individual tenant units | 12.1%          | 11.8%          | 10.0%          | 7.9%                         | 13.7%                         | 11.9%             |
| All individual metered tenant units, no master meter                       | 6.9%           | 11.8%          | 26.7%          | 13.0%                        | 6.9%                          | 8.8%              |
| Respondents (n)                                                            | 116            | 68             | 30             | 102                          | 112                           | 214               |

## 2.4 Heating Equipment

As shown in Table 13, 47 percent of tenants report having the heating system in their unit tuned up annually and nearly 14 percent of tenants report having an annual tune-up done by heating contractor or by a member of the household.

**Table 13. Characteristics of Heating Equipment Located in Tenant Units**

Totals may not sum to 100 percent due to rounding

Source: Tenant survey questions H3, H4, H2, H8, H6

| Characteristics                                                           | Overall Statewide                            |
|---------------------------------------------------------------------------|----------------------------------------------|
| Primary heating system for tenants with separate unit                     | Forced air ducted system to individual rooms |
| Respondents (n)                                                           | 103                                          |
| Age of Primary Heating System                                             | 5–9 years                                    |
| Respondents (n)                                                           | 77                                           |
| Primary Fuel Type                                                         | Natural gas from underground pipes           |
| Respondents (n)                                                           | 100                                          |
| Uses supplemental heat                                                    | 1.4%                                         |
| Respondents (n)                                                           | 379                                          |
| Have annual tune-up done by heating contractor or by someone in household | 13.6%                                        |
| Have annual tune-up done in tenant units                                  | 47.0%                                        |
| Respondents (n)                                                           | 99                                           |

As shown in Table 14, the individual heating systems reported by tenants in tenant units are most likely to be fueled by natural gas (50 percent) or electric (44 percent). Electric heat is more prevalent in climate zones 4 (50 percent) and 6 (54.5 percent), while natural gas is more prevalent in climate zone 5 (69 percent). The majority of the low rise multifamily tenants (almost two-thirds) reported having natural gas heating systems. The majority of high rise multifamily tenants (57 percent) reported having electric heating systems.

**Table 14. Multifamily Tenant Unit Heating Fuel by Climate Zone and Rise**

Comparisons by Climate Zone and High Rise are not reliable due to small sample sizes. Sample sizes are very small for climate zones 4, 5, and 6 so comparisons by climate zone may not be reliable. Sample sizes of 31 or more meet 90/15 confidence/precision, 21 is close to 90/20, and 68 is 90/10 confidence/precision. Totals may not sum to 100 percent due to rounding.

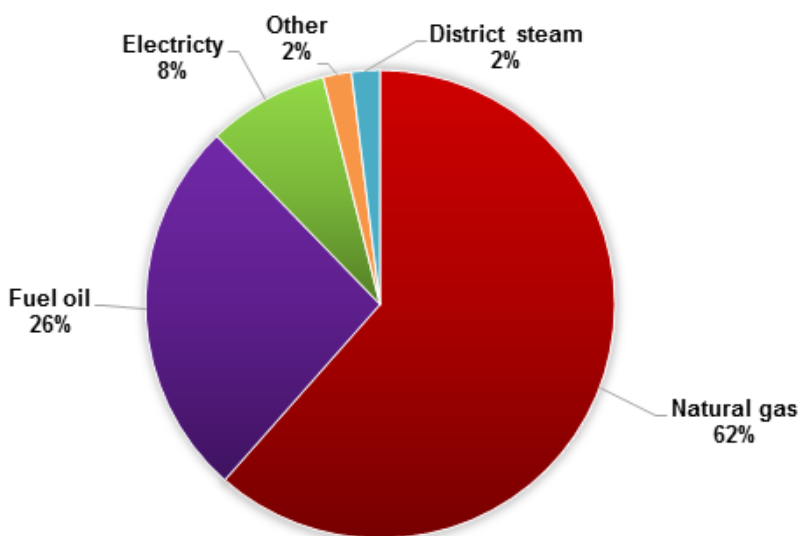
*Source: Tenant survey question H2*

| Primary Heating Fuel               | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|------------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                    | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Natural gas from underground pipes | 42.0%          | 69.1%          | 45.5%          | 65.9%                        | 32.2%                         | 50.2%             |
| Electricity                        | 50.0%          | 28.1%          | 54.5%          | 32.6%                        | 57.3%                         | 44.1%             |
| District steam                     | 5.3%           | 0%             | 0%             | 0%                           | 7.0%                          | 3.3%              |
| Fuel oil                           | 2.7%           | 0%             | 0%             | 0%                           | 3.5%                          | 1.6%              |
| Propane (bottled gas)              | 0%             | 2.8%           | 0%             | 1.5%                         | 0%                            | 0.8%              |
| Respondents (n)                    | 38             | 41             | 21             | 66                           | 34                            | 100               |

Natural gas heating for building (central systems) was most prevalent for all climate zones and all types of buildings (Figure 2 and Table 15). The U.S. Census data for all homes in New York State reported 54.9 percent natural gas and 28.8 percent as fuel oil for primary heating fuels, which is closer to the multifamily central building systems than to tenant unit individual heating systems. The evaluation team could not identify any recent data for multifamily buildings (instead of multifamily tenants) in New York State that reported primary heating fuels for central building systems. The percentage of natural gas is a little higher in central heating systems for multifamily than for all New York State homes, which is expected since many multifamily buildings would be located in urban areas where natural gas was available. At the same time, this illustrates the difficulty in comparing other sources of New York State data for multifamily homes.

**Figure 2. Statewide: Multifamily Central Heating by Fuel Type**

Source: Property owner or manager survey questions H2



**Table 15. Multifamily Central Heating System Heating Fuel by Climate Zone and Rise**

Climate zone sample sizes are very small for climate zone 6 at 90/15 so comparisons by climate zone may not be reliable at 90/10. Totals may not sum to 100 percent due to rounding.

Source: Property owner or manager survey questions H2

| Fuel                       | Climate zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|----------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                            | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Natural gas                | 55.9%          | 84.8%          | 61.3%          | 74.9%                        | 55.8%                         | 61.5%             |
| Fuel oil                   | 33.1%          | 3.0%           | 6.5%           | 7.2%                         | 34.4%                         | 26.2%             |
| Electricity                | 5.9%           | 12.1%          | 32.3%          | 15.7%                        | 5.2%                          | 8.3%              |
| Other combination of fuels | 2.5%           | 0%             | 0%             | 2.2%                         | 1.9%                          | 2.0%              |
| District steam             | 2.5%           | 0%             | 0%             | 0%                           | 2.8%                          | 2.0%              |
| Respondents (n)            | 118            | 66             | 31             | 100                          | 115                           | 215               |

Table 16 illustrates the age of building central heating system equipment by primary heating fuel. About 27 percent of the natural gas central systems and 46 percent of the fuel oil central systems are more than 20 years old and thus provide significant opportunities for replacement with more efficient systems.

**Table 16. Central Heating System Age by Primary Fuel Type**

Fuel type sample sizes are very small for most fuel types, so comparisons by fuel type may not be reliable as at least 31 respondents are needed for 90/15 confidence/precision. Totals may not sum to 100 percent due to rounding.

*Source: Property owner or manager survey questions H2 and H4*

| Age                   | Electricity | Natural Gas | District Steam | Fuel Oil | Other | All Types |
|-----------------------|-------------|-------------|----------------|----------|-------|-----------|
| Less than 2 years old | 8.8%        | 6.4%        | 0%             | 2.8%     | 0%    | 5.4%      |
| 2 to 4 years old      | 0%          | 13.7%       | 0%             | 0%       | 0%    | 8.4%      |
| 5 to 9 years old      | 16.8%       | 25.9%       | 0%             | 25.1%    | 33.3% | 24.5%     |
| 10 to 14 years old    | 12.6%       | 23.5%       | 0%             | 23.3%    | 33.3% | 22.2%     |
| 15 to 19 years old    | 8.8%        | 3.7%        | 0%             | 2.8%     | 0%    | 3.8%      |
| 20 years old or more  | 53.0%       | 26.8%       | 100.0%         | 46.0%    | 33.3% | 35.8%     |
| Respondents (n)       | 22          | 123         | 3              | 38       | 3     | 189       |

Table 17 is most useful in showing the types of heating distribution systems for natural gas and the types of electric systems in tenant units. Although a small sample of 36 tenant survey respondents with electric heat, the responses show that close to 20 percent of those electric systems are reported as being heat pumps. The building (central heating) heating systems are primarily boiler systems (over 73 percent) as shown in Table 18.

**Table 17. Tenant Units Primary Heating System by Primary Heating Fuel Type**

Fuel type sample sizes are very small for all fuel types, so comparisons by fuel type may not be reliable for other than electricity (about 90/14 confidence/precision) and natural gas (slightly better than 90/12). Totals may not sum to 100 percent due to rounding.

Source: Tenant survey question H3

| Primary Heating System                                      | Natural Gas | Oil    | Propane | Electricity | Other  | All Types of Heating Fuels |
|-------------------------------------------------------------|-------------|--------|---------|-------------|--------|----------------------------|
| Forced air system with ducts to individual rooms            | 74.9%       | 0%     | 100.0%  | 17.4%       | 0%     | 47.4%                      |
| Steam/hot water system with radiators or pipes in each room | 15.5%       | 100.0% | 0%      | 12.2%       | 100.0% | 18.6%                      |
| Baseboard heat                                              | 2.7%        | 0%     | 0%      | 33.4%       | 0%     | 15.2%                      |
| Air source heat pump                                        | 6.8%        | 0%     | 0%      | 19.6%       | 0%     | 11.7%                      |
| Other, specify                                              | 0%          | 0%     | 0%      | 8.7%        | 0%     | 3.6%                       |
| District steam with radiators or pipes in each room         | 0%          | 0%     | 0%      | 4.4%        | 0%     | 1.8%                       |
| Portable electric heater                                    | 0%          | 0%     | 0%      | 4.4%        | 0%     | 1.8%                       |
| Respondents (n)                                             | 54          | 1      | 1       | 36          | 2      | 94                         |

**Table 18. Central Heating System by Primary Heating Fuel Type**

Fuel type sample sizes are very small for most fuel types except natural gas which meets 90/10, and fuel oil, which meets 90/13, so comparisons by all fuel types may not be reliable. Heating systems reported by tenants that are within their units. It is possible that some tenants may have reported their own heating system that was in fact part of a building system. “Other” types of systems include Packaged Terminal Air Conditioners (PTACs), heat pump, roof top chiller, wall unit, and combined space heater/water heater. Totals may not sum to 100 percent due to rounding.

*Source: Property owner or manager survey questions H2 and H3*

| Heating System                                      | Electricity | Natural Gas | District Steam | Fuel Oil | Other | Overall Statewide |
|-----------------------------------------------------|-------------|-------------|----------------|----------|-------|-------------------|
| Central boiler with radiators or pipes in each room | 0%          | 73.9%       | 50.0%          | 96.9%    | 33.3% | 73.6%             |
| Baseboard heat                                      | 88.5%       | 6.2%        | 0%             | 0%       | 0%    | 10.3%             |
| Forced air furnace with ducts to individual rooms   | 2.2%        | 14.4%       | 0%             | .6%      | 0%    | 9.3%              |
| Other                                               | 9.2%        | 3.3%        | 0%             | 0%       | 66.7% | 4.1%              |
| District steam with radiators or pipes in each room | 0%          | 2.1%        | 50.0%          | 2.5%     | 0%    | 2.7%              |
| Respondents (n)                                     | 23          | 139         | 2              | 43       | 3     | 210               |

### 2.4.1 Energy Behavior (Heating Equipment)

On average, over half of the tenants indicated they do not usually have annual check-ups done on their individual unit heating systems (Table 19).

Table 20 indicates that annual tune-ups vary based on the heating system type. About half of central forced air furnaces have annual tune-ups compared to about 45 percent of air source heat pumps and 40 percent of steam/hot water systems.

**Table 19. Percentage That Usually Have Annual Tune-up on Heating System**

Climate zone sample sizes are very small for all climate zones so comparisons by climate zone may not be reliable. A sample size of 31 meets 90/15 confidence/precision, but 21 is at 80/15. Totals may not sum to 100 percent due to rounding.

Source: Tenant survey question H6

| Heating System Tune-up | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                        | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| No                     | 55.9%          | 38.3%          | 69.0%          | 55.2%                        | 49.8%                         | 52.4%             |
| Yes                    | 44.1%          | 61.7%          | 31.0%          | 44.8%                        | 50.2%                         | 47.6%             |
| Respondents (n)        | 40             | 38             | 21             | 62                           | 37                            | 99                |

**Table 20. Tenants That Usually Have Annual Tune-up on Heating System by System Type**

System type sample sizes are very small for all system types except Forced Air Systems at 90/12 confidence/precision so comparisons by all system types may not be reliable. Totals may not sum to 100 percent due to rounding.

Source: Tenant survey questions H3 and H6

|                                   | Forced Air System with Ducts to Individual Rooms | Steam/Hot Water System with Radiators or Pipes in each Room | Air Source Heat Pump | Overall Statewide |
|-----------------------------------|--------------------------------------------------|-------------------------------------------------------------|----------------------|-------------------|
| No                                | 49.7%                                            | 59.5%                                                       | 54.5%                | 53.0%             |
| Yes, done by landlord             | 32.0%                                            | 33.8%                                                       | 36.4%                | 33.0%             |
| Yes, done by a heating contractor | 18.3%                                            | 6.7%                                                        | 9.1%                 | 14.0%             |
| Respondents (n)                   | 47                                               | 18                                                          | 6                    | 71                |

## 2.5 Cooling Equipment

As shown in Table 21, 94 percent of tenants report having some type of air conditioning systems—78 percent report a room or window air conditioner and 9 percent report an individual central air system. While over 90 percent of tenants in climate zones 4 and 5 report some type of air conditioning, only 69 percent of climate zone 6 tenants report having air conditioning. Tenants report an average of 0.4 ceiling fans.

**Table 21. Primary Cooling System Type in Tenant Units by Climate Zone**

Climate zone sample sizes are very small for climate zone 6 at 90/12 confidence/precision so comparisons by all 3 climate zones are not at 90/10. Totals may not sum to 100 percent due to rounding.

Source: Tenant survey questions H9 and H11

| Presence and Type of Air Conditioning | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Overall Statewide |
|---------------------------------------|----------------|----------------|----------------|-------------------|
| Room or window air conditioner        | 82.9%          | 52.9%          | 52.9%          | 77.9%             |
| Central air conditioning              | 5.0%           | 32.0%          | 11.8%          | 8.6%              |
| Building central cooling system       | 8.1%           | 4.2%           | 2.2%           | 7.3%              |
| No air conditioning                   | 4.0%           | 9.5%           | 30.9%          | 5.9%              |
| Heat pump                             | 0%             | 1.4%           | 2.2%           | 0.3%              |
| Respondents (n)                       | 249            | 80             | 47             | 376               |

**Figure 3. Air Conditioning Systems for Tenant Units by Climate Zone**

Source: Tenant survey question H9-H11

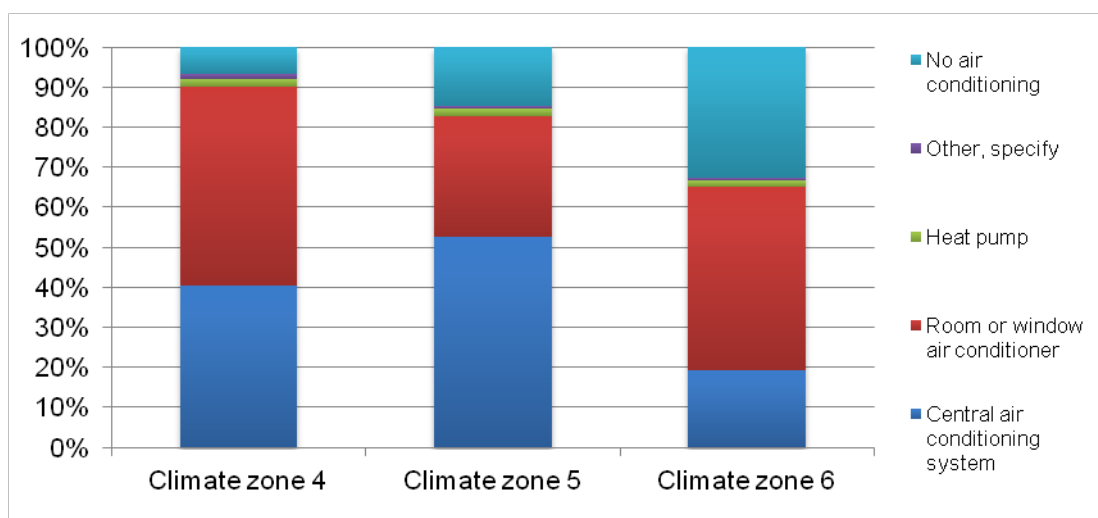


Figure 3 shows that nearly 90% of tenant units in climate zone 4 have air conditioning equipment versus nearly 65% of tenant units in climate zone 6 with air conditioning equipment. Room or window air conditioners are much more prevalent in high rise multifamily buildings (84 percent versus 59 percent in low rise buildings; Table 22).

**Table 22. Primary Air Conditioning System in Tenant Units by Building Type**

Totals may not sum to 100 percent due to rounding.

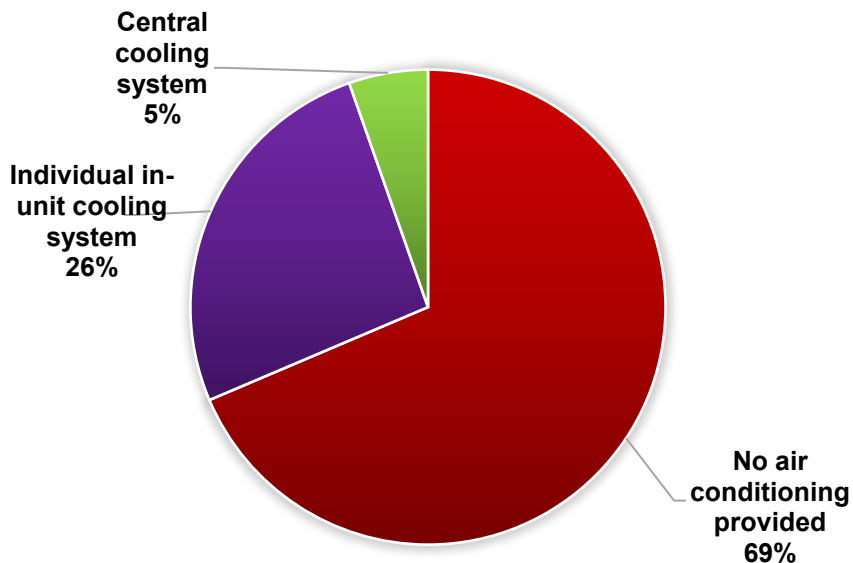
*Source: Tenant survey questions H9 and H11*

| Presence and Type of Air Conditioning | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories | Overall Statewide |
|---------------------------------------|------------------------------|-------------------------------|-------------------|
| Room or window air conditioner        | 58.60%                       | 84.20%                        | 77.90%            |
| Central air conditioning              | 27.30%                       | 2.50%                         | 8.60%             |
| Building central cooling system       | 5.10%                        | 8.00%                         | 7.30%             |
| No air conditioning                   | 8.30%                        | 5.10%                         | 5.90%             |
| Heat pump                             | 0.70%                        | 0.10%                         | 0.30%             |
| Respondents (n)                       | 138                          | 238                           | 376               |

Overall, over two-thirds of the property managers and owners surveyed do not provide air conditioning to their tenants (Figure 4), indicating that a significant percent of tenants provide their own air conditioning system. Property managers and owners in climate zone 5 are most likely to provide air conditioning (62 percent; Figure 5).

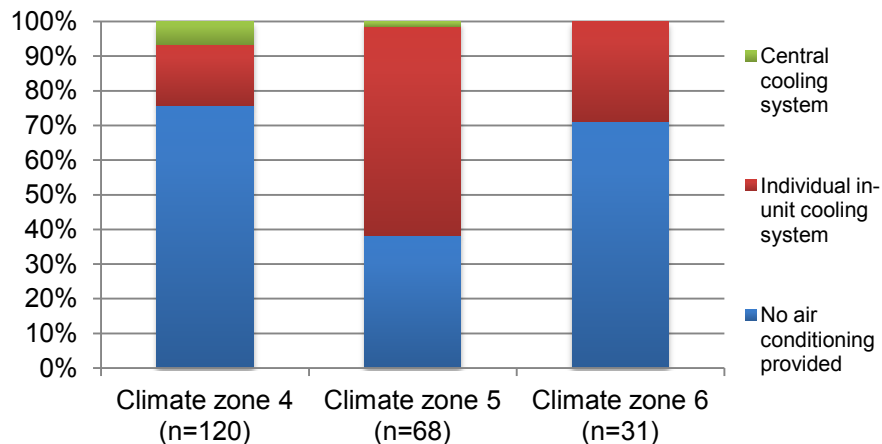
**Figure 4. Multifamily Building Air Conditioning (n=219)**

Source: Multifamily Property Manager or Owner Survey H7



**Figure 5. Multifamily Building Type of Air Conditioning Supplied to Tenant Units by Climate Zone**

Source: Property owner/manager survey question H7



Source: Property owner/manager survey question H7

The tenant reported age of air conditioning equipment varies considerably by climate zone. Over 20 percent of all air conditioners in climate zones 4 and 6 are less than two years old as shown in Table 23. At the same time, more than 30 percent of the air conditioners in climate zone 5 are 10 years or older—eight percent are more than 20 years old.

Table 24 shows that room or window air conditioners are typically newer than individual central air conditioning systems.

**Table 23. Age of Primary Air Conditioning System by Climate Zone in Tenant Units**

Sample sizes are very small for climate zone 5 (90/12) and 6 (80/15), so comparisons by climate zone are not at 90/10 confidence/precision. Totals may not sum to 100 percent due to rounding.

*Source: Tenant survey question H12*

| Air Conditioning System Age | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Overall Statewide |
|-----------------------------|----------------|----------------|----------------|-------------------|
| Less than 2 years old       | 23.4%          | 15.9%          | 25.0%          | 22.6%             |
| 2 to 4 years old            | 36.2%          | 29.4%          | 18.7%          | 35.0%             |
| 5 to 9 years old            | 28.1%          | 23.1%          | 37.5%          | 27.9%             |
| 10 to 14 years old          | 6.7%           | 23.1%          | 14.1%          | 8.6%              |
| 15 to 19 years old          | 3.1%           | 0%             | 0%             | 2.7%              |
| 20 years old or more        | 2.6%           | 8.4%           | 4.7%           | 3.2%              |
| Respondents (n)             | 196            | 53             | 23             | 272               |

**Table 24. Age of Primary Air Conditioning System by AC System Type in Tenant Units**

There was only one heat pump, which was excluded. Central air conditioning only meets 90/14 while room and window units meet 90/10 confidence/precision. Totals may not sum to 100 percent due to rounding.

*Source: Tenant survey questions H11 and H12*

| Air Conditioning System Age | Central Air Conditioning System | Room or Window Air Conditioner | Overall Statewide |
|-----------------------------|---------------------------------|--------------------------------|-------------------|
| Less than 2 years old       | 11.4%                           | 23.7%                          | 22.6%             |
| 2 to 4 years old            | 25.5%                           | 35.9%                          | 35.0%             |
| 5 to 9 years old            | 35.9%                           | 27.0%                          | 27.9%             |
| 10 to 14 years old          | 21.8%                           | 7.4%                           | 8.6%              |
| 15 to 19 years old          | 5.4%                            | 2.4%                           | 2.7%              |
| 20 years old or more        | 0%                              | 3.5%                           | 3.2%              |
| Respondents (n)             | 35                              | 236                            | 272               |

As shown in Table 25, the number of central air conditioner systems reported by property managers or owners by climate zones are too small for comparisons. Based on a 90/14 confidence/precision for climate zone 5, there appears to be more opportunities for replacing older units. More than 17 percent of the climate zone 5 systems were reported by property owners and managers as 20 years old or more and 20 percent of the systems at 15 years old or more.

**Table 25. Multifamily Building Age of Central Air Conditioning System by Climate Zone**

Climate zone sample sizes are very small for all climate zones, so comparisons by climate zone may not be reliable. Totals may not sum to 100 percent due to rounding.

*Source: Property owner or manager survey question H8*

| Age                   | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Overall Statewide |
|-----------------------|----------------|----------------|----------------|-------------------|
| Less than 2 years old | 4.0%           | 5.7%           | 12.5%          | 5.0%              |
| 2 to 4 years old      | 16.0%          | 14.3%          | 0%             | 14.7%             |
| 5 to 9 years old      | 36.0%          | 28.6%          | 37.5%          | 33.4%             |
| 10 to 14 years old    | 24.0%          | 28.6%          | 37.5%          | 26.3%             |
| 15 to 19 years old    | 8.0%           | 5.7%           | 12.5%          | 7.4%              |
| 20 years old or more  | 12.0%          | 17.1%          | 0%             | 13.3%             |
| Respondents (n)       | 25             | 35             | 8              | 68                |

### 2.5.1 Tenant Energy Behavior (Cooling Equipment)

Table 26 shows there are significant opportunities to encourage annual tune-ups on central air conditioning systems and heat pumps with over 50 percent of tenants in climate zones 5 and 6, and high-rise buildings that do not typically have annual tune-ups completed.

**Table 26. Percentage That Usually Have Annual Tune-up on Central Air Conditioning System and Heat Pumps**

Climate zone sample sizes are very small for all climate zones, so comparisons by climate zone may not be reliable. Statewide numbers are at 90/13 confidence/precision. Totals may not sum to 100 percent due to rounding.

Source: Tenant survey question H14

|                 | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Yes             | 64.9%          | 47.0%          | 42.8%          | 59.0%                        | 43.0%                         | 55.8%             |
| No              | 35.1%          | 53.0%          | 57.2%          | 41.0%                        | 57.0%                         | 44.2%             |
| Respondents (n) | 12             | 26             | 4              | 34                           | 8                             | 42                |

## 2.6 Water Heating

Natural gas appears to be the water heating fuel of choice statewide with over 60 percent of water heaters using that fuel. The results are only statistically significant at the overall statewide level at close to 90/10 confidence/precision (Table 27).

**Table 27. Primary Water Heating Fuel Type by Climate Zone in Tenant Units**

Sample sizes are too small for segments other than statewide to be representative at 90/10 confidence/precision. Totals may not sum to 100 percent due to rounding.

Source: Tenant survey question WH3

| Water Heating Fuel Type            | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|------------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                    | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Natural gas from underground pipes | 92.7%          | 47.0%          | 27.0%          | 59.6%                        | 71.1%                         | 62.7%             |
| Electricity                        | 7.3%           | 53.0%          | 73.0%          | 40.4%                        | 28.9%                         | 37.3%             |
| Respondents (n)                    | 14             | 32             | 20             | 53                           | 13                            | 66                |

Central water heating systems that supply the tenant units in a building are quite likely to be fueled by natural gas (over 60 percent statewide) as shown in Table 28. This is similar to the statewide numbers for natural gas water heaters show in Table 27 for tenant units. Climate zone 4 and high rise buildings have a high percentage of fuel oil-fired water heaters with over one-third of their water heaters using that fuel.

**Table 28. Primary Water Heater Fuel Type by Climate Zone for Central Systems in Multifamily Buildings**

Climate zone sample sizes are very small for climate zones 5 (90/15) and 6 (80/20) so comparisons across all climate zones may not be reliable. Totals may not sum to 100 percent due to rounding.

*Source: Property owner or manager survey question WH3*

| Fuel            | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise – 3 or Less Stories | High Rise – 4 or More Stories |                   |
| Natural gas     | 58.7%          | 94.7%          | 88.2%          | 80.7%                        | 59.9%                         | 64.2%             |
| Fuel oil        | 34.9%          | 5.3%           | 5.9%           | 11.7%                        | 35.0%                         | 30.2%             |
| District steam  | 2.8%           | 0%             | 0%             | 0%                           | 2.9%                          | 2.3%              |
| Electricity     | 1.8%           | 0%             | 5.9%           | 3.8%                         | 1.2%                          | 1.7%              |
| Other           | 1.8%           | 0%             | 0%             | 3.8%                         | 1.0%                          | 1.5%              |
| Respondents (n) | 109            | 38             | 17             | 55                           | 109                           | 164               |

Based on the results reported in Table 29 on type of water heating systems, the majority of tenants (about 85 percent) with an individual water heater report having stand-alone storage tank water heaters. Tankless or on-demand water heaters are rare (1.9 percent statewide).

**Table 29. Water Heating System Type by Climate Zone in Tenant Units**

Note: Sample sizes are too small for segments other than statewide to be representative of those populations at close to 90/10. Note: Totals may not sum to 100 percent due to rounding.

Source: Tenant survey question WH2

| Type                               | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|------------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                    | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Stand-alone storage tank           | 84.2%          | 87.8%          | 80.4%          | 81.0%                        | 98.7%                         | 85.3%             |
| Tankless or on demand water heater | 0%             | 4.2%           | 0%             | 2.5%                         | 0%                            | 1.9%              |
| Heat pump water heater             | 7.9%           | 0%             | 12.4%          | 6.6%                         | 0%                            | 5.0%              |
| Part of the heating system boiler  | 7.9%           | 8.0%           | 7.2%           | 9.9%                         | 1.3%                          | 7.8%              |
| Respondents (n)                    | 13             | 34             | 17             | 52                           | 12                            | 64                |

Table 30 shows that the property/manager owners indicate central water heating systems are more likely to be part of the heating system boiler for high rise buildings (74.7 percent). Almost three-quarters (74.3 percent) of multifamily central water heating systems in climate zone 4 are part of heating system boilers.

For water heaters in individual tenant units, approximately one out of six water heaters are over 10 years old, and 45 percent of them are less than four years old (Table 31).

Over one-quarter of the central water heating systems, which are often part of heating system boilers, are more than 20 years old (Table 32).

**Table 30. Water Heating System Type by Climate Zone for Central Systems in Multifamily Buildings**

Climate zone 5 (90/13) and 6 (90/20) have small sample sizes that do not meet 90/10 confidence/precision so comparisons across climate zones may not be reliable. Totals may not sum to 100 percent due to rounding.

Source: Property owner or manager survey question WH2

| Type                          | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                               | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Part of heating system boiler | 74.3%          | 33.3%          | 23.5%          | 40.1%                        | 74.7%                         | 67.4%             |
| Stand-alone storage tank      | 20.2%          | 48.7%          | 76.5%          | 50.5%                        | 19.1%                         | 25.6%             |
| Other                         | 3.7%           | 5.1%           | 0%             | 3.2%                         | 3.9%                          | 3.7%              |
| Tankless or on-demand         | 1.8%           | 7.7%           | 0%             | 4.7%                         | 1.9%                          | 2.5%              |
| Heat pump                     | 0%             | 5.1%           | 0%             | 1.6%                         | 0.4%                          | .7%               |
| Respondents (n)               | 109            | 39             | 17             | 57                           | 108                           | 165               |

**Table 31. Age of Primary Water Heaters by Climate Zone in Tenant Units**

Sample sizes are too small for segments other than statewide to be representative of those populations. Totals may not sum to 100 percent due to rounding.

Source: Tenant survey question WH4

| Age                   | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-----------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                       | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Less than 2 years old | 14.5%          | 22.3%          | 22.4%          | 22.5%                        | 9.1%                          | 18.8%             |
| 2 to 4 years old      | 25.7%          | 29.1%          | 21.2%          | 30.9%                        | 14.0%                         | 26.3%             |
| 5 to 9 years old      | 34.2%          | 38.9%          | 42.3%          | 38.2%                        | 35.0%                         | 37.3%             |
| 10 to 14 years old    | 17.1%          | 9.7%           | 14.1%          | 8.4%                         | 28.0%                         | 13.7%             |
| 15 to 19 years old    | 8.6%           | 0%             | 0%             | 0%                           | 14.0%                         | 3.8%              |
| Respondents (n)       | 12             | 26             | 15             | 42                           | 11                            | 53                |

**Table 32. Age of Primary Water Heaters by Climate Zone for Central Building Systems**

Climate zone sample sizes are very small for climate zones 5 (90/15) and 6 (90/20), so comparisons by climate zone may not be reliable. Totals may not sum to 100 percent due to rounding.

Source: Property owner or manager survey question WH4

| Age                   | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-----------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                       | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Less than 2 years old | 9.6%           | 16.7%          | 6.3%           | 14.5%                        | 9.3%                          | 10.4%             |
| 2 to 4 years old      | 8.5%           | 16.7%          | 25.0%          | 14.7%                        | 8.9%                          | 10.2%             |
| 5 to 9 years old      | 21.3%          | 33.3%          | 25.0%          | 34.3%                        | 19.9%                         | 23.0%             |
| 10 to 14 years old    | 24.5%          | 27.8%          | 31.3%          | 18.8%                        | 26.9%                         | 25.1%             |
| 15 to 19 years old    | 4.3%           | 0%             | 6.3%           | 9.1%                         | 2.3%                          | 3.7%              |
| 20 years old or more  | 31.9%          | 5.6%           | 6.3%           | 8.5%                         | 32.7%                         | 27.5%             |
| Respondents (n)       | 94             | 36             | 16             | 52                           | 94                            | 146               |

## 2.7 Lighting Equipment

Table 33 shows that there are opportunities to replace incandescent lights with more efficient lighting even though about one-half of lighting in tenant units and common areas are already CFLs and LEDs. On average, there are more than two incandescent lights in each tenant unit that are used more than two hours per day. With an average of 6.7 lights in each unit, the incandescent lights represent more than one-third of light bulbs.

**Table 33. Average Number of Light Bulbs Used Two or More Hours per day Inside Home by Climate Zone**

Climate zone 6 sample size is smallest, but meets 90/12 confidence/precision.

Source: Tenant survey questions L5a, L5b, L5c

| Bulb Type    |                 | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|--------------|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|              |                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| CFLs/LEDs    | Mean            | 3.3            | 2.7            | 3.0            | 3.3                          | 3.2                           | 3.2               |
|              | Respondents (n) | 247            | 81             | 47             | 139                          | 236                           | 375               |
| Incandescent | Mean            | 2.4            | 2.4            | 1.9            | 2.5                          | 2.4                           | 2.4               |
|              | Respondents (n) | 247            | 81             | 47             | 139                          | 236                           | 375               |
| Other bulbs  | Mean            | 1.1            | 1.0            | 1.2            | 0.7                          | 1.2                           | 1.1               |
|              | Respondents (n) | 247            | 81             | 47             | 139                          | 236                           | 375               |

Table 34 shows how the lamp types break down by percentage of total lighting in common spaces in multifamily buildings. About 18 percent of the lighting is incandescent and T12 lamps that could be replaced now with more efficient lighting, although federal requirements will transform the market away from less efficient incandescent lights. The Energy Independence and Security Act of 2007 (EISA) requires about 25 percent greater efficiency for light bulbs, phased in from 2012 through 2014, which will eliminate the manufacturing and importing of most conventional incandescent light bulbs. There is a redesigned incandescent bulb that claims to be 50 percent greater efficiency than conventional incandescent lights.

Over half of the lighting in common areas is either CFLs (45 percent) or LEDs (11 percent). Climate zone 4 has a higher percentage of LEDs (12 percent) compared to the other two climate zones. Climate zone 6 has the highest percentage of CFLs (58 percent) with climate zone 4 having the lowest percentage of CFLs at 44 percent. Overall statewide, about three-quarters of bulbs are efficient according to the survey reports which closely match the data verified during the on-site inspections which found about 80 percent to be efficient. This may indicate that climate zone 4 multifamily buildings are moving up to the even more efficient LEDs.

**Table 34. Percentage of Lamp Type Distribution for Indoor Common Space by Climate Zone and Rise**

Climate zone sample sizes smaller for climate zones 5 (90/12) and 6 (90/20) so comparisons by climate zone are not reliable for 90/10 confidence/precision. Totals may not sum to 100 percent due to rounding.

Source: Property owner or manager survey question L3

| Bulb Type       | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Incandescent    | 5.0%           | 15.7%          | 16.1%          | 13.3%                        | 5.1%                          | 7.6%              |
| T12             | 11.6%          | 8.7%           | 8.6%           | 14.9%                        | 9.2%                          | 10.9%             |
| T8              | 13.3%          | 14.2%          | 13.9%          | 12.1%                        | 14.1%                         | 13.5%             |
| T5              | 2.8%           | 5.3%           | 2.0%           | 2.3%                         | 3.6%                          | 3.2%              |
| CFL             | 43.6%          | 46.0%          | 58.3%          | 45.3%                        | 44.5%                         | 44.8%             |
| Halogen         | 0.5%           | 0.1%           | 0%             | 0.6%                         | 0.3%                          | 0.4%              |
| HID             | 0.1%           | 0.2%           | 0%             | 0.1%                         | 0.1%                          | 0.1%              |
| LED             | 12.3%          | 7.8%           | 1.0%           | 10.1%                        | 11.2%                         | 10.9%             |
| Other           | 10.8%          | 2.0%           | 0%             | 1.3%                         | 11.7%                         | 8.6%              |
| Respondents (n) | 88             | 53             | 22             | 75                           | 88                            | 163               |

### 2.7.1 Daylighting and Controls

As shown in Table 35, a sizeable percentage of property managers and owners do not use lighting controls or daylighting in common areas. Large uncovered windows were most often mentioned (51 percent), followed by timers (37 percent). Tubular skylights are the least common (7 percent) type of lighting controls and daylighting in common areas.

**Table 35. Types of Lighting Controls and Daylighting Use in Indoor Common Areas**

Climate zone 6 sample size is at 90/15 so comparisons by climate zone are less reliable than 90/10. Totals may not sum to 100 percent due to rounding.

*Source: Property owner or manager survey question L4*

| Lighting Control Type        | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                              | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Skylights                    | 25.0%          | 8.8%           | 9.7%           | 12.6%                        | 25.1%                         | 21.3%             |
| Tubular skylights            | 7.5%           | 7.4%           | 0%             | 4.5%                         | 8.3%                          | 7.1%              |
| Large uncovered window areas | 50.0%          | 57.4%          | 48.4%          | 50.1%                        | 51.8%                         | 51.3%             |
| Dimmer switches              | 13.4%          | 22.7%          | 16.1%          | 22.5%                        | 12.1%                         | 15.3%             |
| Occupancy/Motion sensors     | 28.6%          | 36.4%          | 29.0%          | 31.9%                        | 29.2%                         | 30.0%             |
| Timers                       | 35.3%          | 45.5%          | 29.0%          | 37.5%                        | 36.6%                         | 36.9%             |
| Respondents (n)              | 119            | 66             | 31             | 101                          | 115                           | 216               |

## 2.8 Appliances—Kitchen and Laundry

Table 36 shows primary appliances in tenant units and whether they meet ENERGY STAR® ratings if the appliances are rated. Energy efficient products such as programmable thermostats and heat pump dryers are also included. The responses are shown for various segments including climate zone and new construction, but it is important to examine the sample size to determine if they are at least reliable at the 90/15 confidence/precision interval with a sample of 31 or more.

Tenant responses to the telephone and Web surveys indicate opportunities for energy efficient refrigerators and dishwashers. Less than 50 percent of appliances and equipment less than 10 years old were reported by tenants as being ENERGY STAR. In addition, twenty percent or more of refrigerators and dishwashers are 10 years or older. It is important to recognize that these are based on self-reports from tenant surveys that typically over-state the percentage of ENERGY STAR equipment.

**Table 36. Percentage of Tenant Equipment/Appliances That Are Efficient by Climate Zone and Construction Type**

Because of small sample sizes, only data with 31 respondents or more (n) meet at least a 90/15 precision/confidence.

Source: Tenant survey questions H5, H19, H13, WH10, K7, K17a, C6b, C10, P2b, A13c.

| Equipment and % ENERGY STAR for those less than 10 years old |                 | Climate Zone   |                |                | Construction Type                      |                                             | Overall Statewide (< 10 Years Old) |
|--------------------------------------------------------------|-----------------|----------------|----------------|----------------|----------------------------------------|---------------------------------------------|------------------------------------|
|                                                              |                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | New Construction - Built 2012 or Later | Existing Construction - Built Prior to 2012 |                                    |
| Primary heating system                                       | % ENERGY STAR   | 42.5%          | 55.2%          | 42.9%          | 100.0%                                 | 42.3%                                       | 45.8%                              |
|                                                              | Respondents (n) | 18             | 17             | 7              | 6                                      | 36                                          | 42                                 |
| Programmable thermostat                                      | % installed     | 20.5%          | 46.2%          | 38.2%          | 94.6%                                  | 24.1%                                       | 24.5%                              |
|                                                              | Respondents (n) | 251            | 81             | 47             | 11                                     | 368                                         | 379                                |
| Primary cooling system                                       | % ENERGY STAR   | 75.4%          | 50.5%          | 66.7%          | 100.0%                                 | 72.5%                                       | 72.8%                              |
|                                                              | Respondents (n) | 139            | 33             | 15             | 5                                      | 182                                         | 187                                |
| Dishwasher                                                   | % ENERGY STAR   | 51.6%          | 27.0%          | 9.5%           | 94.7%                                  | 44.5%                                       | 45.2%                              |
|                                                              | Respondents (n) | 54             | 26             | 14             | 6                                      | 88                                          | 94                                 |
| Refrigerator                                                 | % ENERGY STAR   | 42.2%          | 25.8%          | 25.3%          | 97.0%                                  | 38.8%                                       | 39.4%                              |
|                                                              | Respondents (n) | 132            | 40             | 30             | 8                                      | 194                                         | 202                                |
| Clothes washer                                               | % ENERGY STAR   | 71.7%          | 55.2%          | 83.8%          | 100.0%                                 | 68.1%                                       | 69.0%                              |
|                                                              | Respondents (n) | 25             | 17             | 7              | 6                                      | 43                                          | 49                                 |
| Clothes dryer - heat pump dryer                              | % ENERGY STAR   | 7.1%           | 0%             | 0%             | 0%                                     | 5.0%                                        | 5.0%                               |
|                                                              | Respondents (n) | 28             | 24             | 9              | 6                                      | 55                                          | 61                                 |

A number of appliances located in tenant units are over 10 years old and could be replaced with a newer energy-efficient model, specifically clothes washers, clothes dryers, refrigerators, and dishwashers as shown in Table 37.

**Table 37. Primary Appliances in Tenant Units 10 Years Old, or Older by Climate Zone and Rise***Source: Tenant survey questions C6, C9, K6, Wh9*

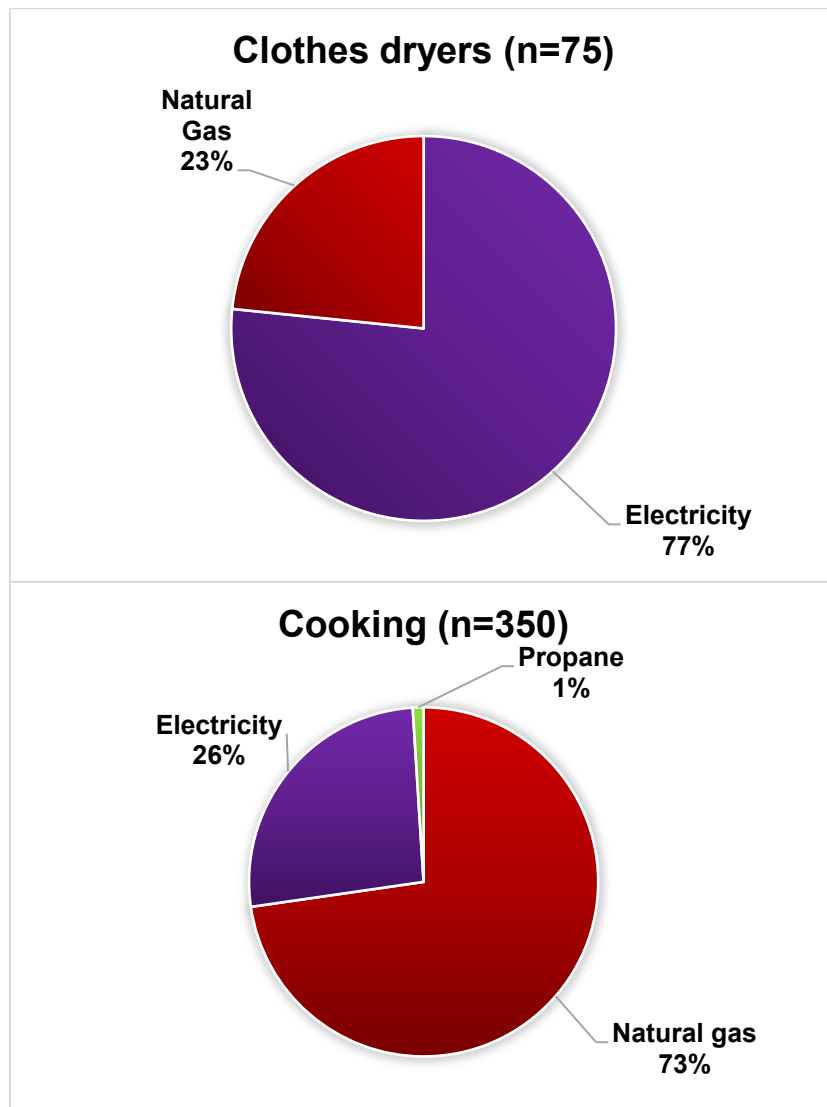
| Appliance Type        | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise | High Rise | Overall Statewide |
|-----------------------|----------------|----------------|----------------|----------|-----------|-------------------|
| Clothes Washer (n=73) | 13.6%          | 26.0%          | 9.8%           | 23.0%    | 10.6%     | 15.9%             |
| Clothes Dryer (n=68)  | 18.9%          | 26.0%          | 9.8%           | 27.8%    | 12.9%     | 19.9%             |
| Refrigerator (n=269)  | 20.4%          | 30.5%          | 26.4%          | 20.0%    | 22.4%     | 21.8%             |
| Dishwasher (n=141)    | 21.9%          | 30.3%          | 15.0%          | 26.1%    | 21.5%     | 23.0%             |

### 2.8.1 Cooking and Clothes Drying

Figure 6 and Figure 6 show that while the majority of tenants (73 percent) report using natural gas for cooking, those that have a clothes dryer in their unit are more likely to report that it is electric (77 percent). Sixty-seven percent of property owners or managers report having a common area laundry in their building. Opposite to the tenant unit dryer fuel, 68 percent of common area dryers are fueled with natural gas.

**Figure 6. Tenant Unit Cooking and Clothes Drying Fuel Use, Statewide**

*Source: Tenant survey questions C8, K2*



## 2.8.2 Clothes Washer and Dishwater Usage

Tenants average between four and five loads of clothes washed per week with no distinct differences by climate zone as shown in Table 38. The number of times the dishwasher is used is between two and three cycles per week and is relatively consistent across climate zones. Because these results are similar across the climate zones, there is an opportunity to design similar marketing messages around energy saving behaviors such as using cold wash cycles, running the appliances in off-peak times, and so forth.

**Table 38. Tenant Unit Average Number of Loads/Cycles per Week by Climate Zone**

Sample sizes are small for climate zones 5 (90/12) and 6 (90/17), so comparisons by climate zone are not reliable at 90/10 confidence/precision.

*Source: Tenant survey questions C3, WH11, A13a.*

| Appliance Type |                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Overall Statewide |
|----------------|-----------------|----------------|----------------|----------------|-------------------|
| Clothes washer | Mean            | 4.7            | 4.6            | 4.5            | 4.6               |
|                | Respondents (n) | 41             | 27             | 14             | 82                |
| Dishwasher     | Mean            | 2.7            | 2.1            | 2.3            | 2.6               |
|                | Respondents (n) | 106            | 53             | 25             | 184               |

## 2.9 Plug Loads—Computers, Communication, and Entertainment

### 2.9.1 Computer Use

Tenants reported having about two computers—desktops plus laptops. In addition to the computers, one in every two tenants has a combination (multifunction) printer/copier/scanner/fax machine (Table 39).

Table 40 shows that tenants reported that their computers are used between three and four hours per day with tenants in climate zone 4 and in high rise buildings using them slightly more than four hours per day on average.

Table 41 shows that about half of tenants report turning off their computers when not in use, although only about 14 percent use smart strips to power off computers, printers, or other equipment after periods of inactivity.

**Table 39. Average Number of Office Equipment per Unit by Climate Zone**

Sample sizes are small for climate zone 6 with 47 respondents at 90/12 confidence/precision.

Source: Tenant survey question A7.

| Equipment Type                         |                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Overall Statewide |
|----------------------------------------|-----------------|----------------|----------------|----------------|-------------------|
| Desktop computer excluding monitor     | Mean            | 0.4            | 0.3            | 0.8            | 0.4               |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| Laptop computer                        | Mean            | 1.2            | 0.9            | 1.3            | 1.1               |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| Tablet computer                        | Mean            | 0.8            | 0.4            | 0.5            | 0.8               |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| CRT computer monitor                   | Mean            | 0              | 0.0            | 0.3            | 0                 |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| LCD/LED computer monitor               | Mean            | 0.3            | 0.2            | 0.7            | 0.4               |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| eReader                                | Mean            | 0.3            | 0.2            | 0.3            | 0.3               |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| Combination printer/copier/scanner/fax | Mean            | 0.5            | 0.4            | 0.6            | 0.5               |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| Individual printer                     | Mean            | 0.2            | 0.2            | 0.2            | 0.2               |
|                                        | Respondents (n) | 251            | 80             | 47             | 378               |
| Modem or router                        | Mean            | 0.9            | 0.7            | 0.9            | 0.9               |
|                                        | Respondents (n) | 251            | 76             | 27             | 354               |

**Table 40. Average Number of Hours Computer Used Per Day by Climate Zone and Rise**

Sample sizes are smaller for climate zones 5 and 6 with 90/15 or more confidence/precision, so comparisons by climate zone are less reliable than by climate zone 4 building types and statewide that meet 90/10.

Source: Tenant survey question A9a and A9b.

| Computer Type    |                 | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|------------------|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                  |                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Desktop computer | Mean            | 4.4            | 3.8            | 3.0            | 3.1                          | 4.7                           | 4.2               |
|                  | Respondents (n) | 89             | 26             | 23             | 58                           | 80                            | 138               |
| Laptop computer  | Mean            | 3.4            | 3.2            | 3.5            | 3.2                          | 3.4                           | 3.4               |
|                  | Respondents (n) | 190            | 55             | 38             | 102                          | 181                           | 283               |

**Table 41. Typically Shutdown Computer by Climate Zone**

Note: Climate zone sample sizes are small for climate zone 6 with 43 at about 90/12 so comparisons by climate zone may not be reliable at 90/10 confidence/precision. Note: Totals may not sum to 100 percent due to rounding.

Source: Tenant survey questions A10

|                 | Climate Zone      |                   |                   | Low or High Rise                   |                                     | Overall<br>Statewide |
|-----------------|-------------------|-------------------|-------------------|------------------------------------|-------------------------------------|----------------------|
|                 | Climate<br>Zone 4 | Climate<br>Zone 5 | Climate<br>Zone 6 | Low Rise -<br>3 or Less<br>Stories | High Rise -<br>4 or More<br>Stories |                      |
| Yes             | 48.7%             | 55.5%             | 43.5%             | 53.0%                              | 48.1%                               | 49.3%                |
| No              | 51.3%             | 44.5%             | 56.5%             | 47.0%                              | 51.9%                               | 50.7%                |
| Respondents (n) | 224               | 66                | 43                | 123                                | 210                                 | 333                  |

**Table 42. Smart Strips by Climate Zone**

Climate zone sample sizes are very small for all climate zones, so comparisons by climate zone may not be reliable. At least 31 are needed in the segment to meet 90/15 confidence/precision. Totals may not sum to 100 percent due to rounding.

Source: Tenant survey questions A8 and A8a

|                           |                                                                                                             | Climate Zone      |                   |                   | Low or High Rise                   |                                        |                      |
|---------------------------|-------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|------------------------------------|----------------------------------------|----------------------|
|                           |                                                                                                             | Climate<br>Zone 4 | Climate<br>Zone 5 | Climate<br>Zone 6 | Low rise -<br>3 or Less<br>Stories | High rise<br>- 4 or<br>More<br>Stories | Overall<br>Statewide |
| Use<br>smart<br>strip     | Yes                                                                                                         | 13.4%             | 13.9%             | 16.2%             | 13.3%                              | 13.7%                                  | 13.6%                |
|                           | No                                                                                                          | 86.6%             | 86.1%             | 83.8%             | 86.7%                              | 86.3%                                  | 86.4%                |
|                           | Respondents (n)                                                                                             | 239               | 78                | 45                | 134                                | 228                                    | 362                  |
| Type of<br>smart<br>strip | Tier 1 smart strip that<br>may turn off when<br>your computer is<br>powered off or goes<br>to sleep         | 81.8%             | 87.5%             | 83.3%             | 84.3%                              | 82.0%                                  | 82.7%                |
|                           | Tier 2 smart strip that<br>turns off when you<br>leave or is<br>programmed to turn<br>off at a certain time | 9.1%              | 0%                | 0%                | 0%                                 | 10.3%                                  | 7.2%                 |
|                           | Both Tier 1 and Tier<br>2 smart strip                                                                       | 9.1%              | 12.5%             | 16.7%             | 15.7%                              | 7.7%                                   | 10.1%                |
|                           | Respondents (n)                                                                                             | 22                | 8                 | 6                 | 16                                 | 20                                     | 36                   |

## 2.9.2 Use of Televisions and Other Electronics

On average, each tenant unit has 1.6 televisions per tenant unit. The majority of them are reported as flat screen LCD/LED; an average of 0.9 per tenant unit. Among LCD/LED and plasma TVs, over two-thirds of tenants indicate them to be ENERGY STAR-rated (Table 43).

**Table 43. Televisions by Type - Average Number in Tenant Units**

Climate zone sample sizes are small for climate zone 6, so comparisons by climate zone may not be reliable at the 90/10 confidence/precision (47 is 90/12).

*Source: Tenant survey question A2.*

| TV Type                     |                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Overall Statewide |
|-----------------------------|-----------------|----------------|----------------|----------------|-------------------|
| Standard                    | Mean            | 0.3            | 0.5            | 0.2            | 0.3               |
|                             | Respondents (n) | 249            | 81             | 47             | 377               |
| Flat screen Plasma          | Mean            | 0.2            | 0.2            | 0.2            | 0.2               |
|                             | Respondents (n) | 249            | 81             | 47             | 377               |
| Flat screen LCD/LED         | Mean            | 0.9            | 0.7            | 1.0            | 0.9               |
|                             | Respondents (n) | 249            | 81             | 47             | 377               |
| Rear projection             | Mean            | 0              | 0              | 0              | 0                 |
|                             | Respondents (n) | 249            | 81             | 47             | 377               |
| Flat screen of unknown type | Mean            | 0.2            | 0.3            | 0.1            | 0.2               |
|                             | Respondents (n) | 249            | 80             | 33             | 362               |

Table 44 shows the prevalence of other types of entertainment and communication plug load equipment. Tenants also report the presence of various communication and entertainment equipment types in their units. On average, at least one out of every two tenants has a DVD/Blu-Ray player, cable/satellite/set top box, cell phone and smart phone, cordless phone, and stereo system.

**Table 44. Entertainment and Communications Equipment by Type - Average Number per Tenant Unit by Climate Zone**

Climate zone sample sizes are very small for climate zones 5 and 6 for some equipment, so comparisons by climate zone may not be reliable. At least 31 respondents are needed to meet 90/15.

Source: Tenant survey questions A12c, A12d, A13a, A12f, A12a, A13i, A12i, A12j, A12k, A13d.

| Equipment                     |                                                   | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Overall Statewide |
|-------------------------------|---------------------------------------------------|----------------|----------------|----------------|-------------------|
| DVD/Blu-Ray player            | Mean                                              | 0.7            | 0.6            | 0.6            | 0.7               |
|                               | Respondents (n)                                   | 248            | 80             | 47             | 375               |
| VCR                           | Mean                                              | 0.2            | 0.2            | 0.3            | 0.2               |
|                               | Respondents (n)                                   | 248            | 80             | 47             | 375               |
| DVD/VCR player ENERGY STAR    | % ENERGY STAR (all)                               | 53.9%          | 50.2%          | 40.0%          | 52.8%             |
|                               | Respondents (n)                                   | 100            | 23             | 20             | 143               |
| Video gaming system           | Mean                                              | 0.4            | 0.4            | 0.8            | 0.4               |
|                               | Respondents (n)                                   | 248            | 80             | 47             | 375               |
| Cable, satellite, set-top box | Cable, satellite, set-top box                     | 0.5            | 0.4            | 0.3            | 0.5               |
|                               | Respondents (n)                                   | 248            | 80             | 47             | 375               |
|                               | % ENERGY STAR cable, satellite, set-top box (all) | 19.4%          | 28.9%          | 21.3%          | 20.6%             |
| Cell phone & smart phones     | Mean                                              | 1.7            | 1.4            | 1.8            | 1.7               |
|                               | Respondents (n)                                   | 248            | 80             | 47             | 375               |
| Cordless phones               | Mean                                              | 0.9            | 0.7            | 0.5            | 0.8               |
|                               | Respondents (n)                                   | 248            | 80             | 47             | 375               |
| Stereo system                 | Mean                                              | 0.5            | 0.3            | 0.4            | 0.5               |
|                               | Respondents (n)                                   | 248            | 80             | 47             | 375               |
| Stereo system ENERGY STAR     | % ENERGY STAR                                     | 20.3%          | 0%             | 27.3%          | 18.8%             |
|                               | Respondents (n)                                   | 69             | 15             | 11             | 95                |

## 2.10 Other Multifamily Building Energy Uses

Low-rise multifamily buildings were more likely than high-rise buildings to have swimming pools (over one-third of high-rise buildings compared to three percent of high rise multifamily buildings) with about 40 percent of them being heated. About 70 percent of the pools were reported to have high efficiency pool pumps. Twenty-four percent of property owners or managers report having a common area exercise room. These results are in Table 45.

**Table 45. Pool, Hot Tub, Exercise Equipment and Characteristics in Common Areas**

Climate zone sample sizes are very small for some equipment segments, so comparisons by climate zone may not be reliable. At least 31 respondents are needed to meet 90/15 and 68 for 90/10 confidence/precision. Totals may not sum to 100 percent due to rounding

Source: Property owner/manager survey questions C8, C9, C10, C16, C14, C12.

|                                                                            |                 | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|----------------------------------------------------------------------------|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                                                            |                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Buildings with swimming pool                                               | Yes             | 8.3%           | 36.8%          | 3.2%           | 35.3%                        | 3.7%                          | 13.4%             |
|                                                                            | Respondents (n) | 120            | 68             | 31             | 103                          | 116                           | 219               |
| Pool that are heated                                                       | Yes             | 40.0%          | 44.0%          | 100%           | 41.0%                        | 50.0%                         | 42.7%             |
|                                                                            | Respondents (n) | 10             | 25             | 1              | 32                           | 4                             | 36                |
| Pools with high efficiency pool pumps                                      | Yes             | 85.7%          | 50.0%          | 0%             | 72.9%                        | 50.0%                         | 69.2%             |
|                                                                            | Respondents (n) | 7              | 12             | 1              | 18                           | 2                             | 20                |
| Common Area Exercise Room                                                  | Yes             | 22.5%          | 30.9%          | 25.8%          | 34.3%                        | 19.8%                         | 24.2%             |
|                                                                            | Respondents (n) | 120            | 68             | 31             | 103                          | 116                           | 219               |
| Average number of exercise equipment in exercise room or gym (common area) | Mean            | 1.8            | 0.9            | 0.6            | 1.4                          | 1.6                           | 1.6               |
|                                                                            | Respondents (n) | 119            | 67             | 31             | 102                          | 115                           | 217               |

## 2.11 Energy Efficiency Program Awareness and Participation

Less than 10 percent of tenants (7.6 percent) reported participating in an energy efficiency program.

Among those that had participated, the most frequently installed equipment were lighting (52 percent), air conditioning (27 percent), and insulation or weatherization (20 percent) (Table 46).

**Table 46. Tenant Awareness of and Participation in Energy Efficiency Programs by Climate Zone**

Sample sizes are small for climate zone 6 and do not meet the 90/10 confidence/precision.

Source: Tenant survey questions U8, U9, U10.

|                                                    |                                             | Climate Zone      |                   |                   | Low or High Rise                   |                                     | Overall<br>Statewide |
|----------------------------------------------------|---------------------------------------------|-------------------|-------------------|-------------------|------------------------------------|-------------------------------------|----------------------|
|                                                    |                                             | Climate<br>Zone 4 | Climate<br>Zone 5 | Climate<br>Zone 6 | Low Rise - 3<br>or Less<br>Stories | High Rise - 4<br>or More<br>Stories |                      |
| Participated in<br>energy efficiency<br>program    | Yes                                         | 7.2%              | 9.5%              | 11.0%             | 7.4%                               | 7.7%                                | 7.6%                 |
|                                                    | No                                          | 92.8%             | 90.5%             | 89.0%             | 92.6%                              | 92.3%                               | 92.4%                |
|                                                    | Respondents (n)                             | 251               | 81                | 47                | 139                                | 240                                 | 379                  |
| Equipment<br>purchased/recycled<br>through program | Insulation or<br>weatherization<br>measures | 17.6%             | 14.1%             | 60.0%             | 43.6%                              | 12.1%                               | 19.9%                |
|                                                    | Heating equipment                           | 0%                | 0%                | 20.0%             | 5.4%                               | 0%                                  | 1.3%                 |
|                                                    | AC equipment                                | 35.3%             | 0%                | 0%                | 0%                                 | 36.3%                               | 27.2%                |
|                                                    | Lighting                                    | 47.1%             | 70.4%             | 60.0%             | 61.8%                              | 48.3%                               | 51.7%                |
|                                                    | Water heating<br>equipment                  | 0%                | 14.1%             | 40.0%             | 19.9%                              | 0%                                  | 5.0%                 |
|                                                    | Clothes washer                              | 5.9%              | 0%                | 0%                | 0%                                 | 6.0%                                | 4.5%                 |
|                                                    | Appliances                                  | 11.8%             | 0%                | 40.0%             | 10.8%                              | 12.1%                               | 11.8%                |
|                                                    | Refrigerator or freezer<br>recycling        | 5.9%              | 1.4%              | 20.0%             | 5.4%                               | 6.3%                                | 6.1%                 |
|                                                    | Other                                       | 29.4%             | 28.2%             | 0%                | 9.1%                               | 33.2%                               | 27.2%                |
|                                                    | Respondents (n)                             | 17                | 8                 | 5                 | 12                                 | 18                                  | 30                   |
| Reason for not<br>participating in<br>program      | Am not aware of any                         | 56.2%             | 39.3%             | 37.6%             | 40.8%                              | 57.5%                               | 53.4%                |
|                                                    | Do not need anything<br>done                | 8.2%              | 7.7%              | 9.9%              | 4.2%                               | 9.5%                                | 8.2%                 |
|                                                    | Don't know who to<br>contact to participate | 14.7%             | 4.5%              | 9.9%              | 7.5%                               | 15.2%                               | 13.3%                |
|                                                    | Can't afford to install<br>new equipment    | 9.5%              | 3.2%              | 10.3%             | 6.2%                               | 9.6%                                | 8.8%                 |
|                                                    | My energy bills aren't<br>that high         | 15.1%             | 19.5%             | 12.4%             | 14.1%                              | 16.0%                               | 15.5%                |
|                                                    | I rent                                      | 40.9%             | 70.6%             | 69.8%             | 58.4%                              | 41.6%                               | 45.7%                |
|                                                    | Other                                       | 4.8%              | 3.2%              | 0%                | 4.4%                               | 4.3%                                | 4.4%                 |
|                                                    | Too busy                                    | 6.5%              | 3.0%              | 0%                | 0.7%                               | 7.5%                                | 5.8%                 |
|                                                    | Recently moved                              | 5.5%              | 3.2%              | 2.5%              | 2.2%                               | 6.0%                                | 5.1%                 |
|                                                    | Respondents (n)                             | 232               | 72                | 42                | 127                                | 219                                 | 346                  |

Among those tenants who had not yet participated, the most frequently mentioned reasons were lack of awareness (53 percent), the fact that they rent (46 percent), and low energy bills (16 percent).

Property owners and managers report a number of different decision makers when it comes to installing energy efficient equipment. Property managers are the most frequently cited decision maker (42 percent), followed by a condo or co-op board (27 percent), and the property owner (23 percent). Property owners and managers in high-rise buildings are more likely to cite the property manager or condo or co-op board as being the decision maker (Table 47).

**Table 47. People Involved in Decision Making to Install Energy Efficient Equipment by Climate Zone and Rise**

Climate zone sample sizes are small for climate zone 6 with 31 respondents for a 90/15 confidence/precision, so comparisons by climate zone will not meet 90/10. Totals may not sum to 100 percent due to rounding.

*Source: Property owner/manager survey questions DPI*

| Decision Maker                                  | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-------------------------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Owner                                           | 21.0%          | 28.4%          | 32.3%          | 22.9%                        | 22.9%                         | 22.9%             |
| Property manager, leasing manager, or associate | 43.7%          | 32.8%          | 48.4%          | 34.6%                        | 45.2%                         | 41.9%             |
| Senior property manager                         | 7.6%           | 7.5%           | 9.7%           | 5.1%                         | 8.8%                          | 7.6%              |
| Maintenance supervisor                          | 4.2%           | 20.9%          | 19.4%          | 19.6%                        | 2.9%                          | 8.0%              |
| Purchasing manager                              | 0.8%           | 1.5%           | 0%             | 0.9%                         | 0.9%                          | 0.9%              |
| Condo or co-op board                            | 33.6%          | 7.5%           | 0%             | 16.2%                        | 32.0%                         | 27.2%             |
| Tenants                                         | 3.4%           | 3.0%           | 0%             | 3.9%                         | 2.8%                          | 3.1%              |
| Other                                           | 14.3%          | 13.2%          | 3.2%           | 13.4%                        | 13.6%                         | 13.6%             |
| Respondents (n)                                 | 119            | 68             | 31             | 103                          | 115                           | 218               |

Sixty-five percent of property owners or managers report being aware of energy efficiency programs offered to multifamily properties (Table 48). Awareness varies by climate zone with 65 percent of property managers aware in climate zones 4 and 5, and 57 percent aware in climate zone 6. Awareness did not differ by low- or high -rise.

**Table 48. Aware of Energy Efficiency Programs Offered to Multifamily Properties**

Sample size for climate zone 6 is at a lower 90/15 confidence/precision than other segments. Totals may not sum to 100 percent due to rounding.

Source: Property owner/manager survey questions DP8

|                 | Climate Zone   |                |                | Low or High Rise             |                               |                   |
|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories | Overall Statewide |
| Yes             | 65.2%          | 65.1%          | 56.7%          | 64.8%                        | 64.7%                         | 64.7%             |
| No              | 34.8%          | 34.9%          | 43.3%          | 35.2%                        | 35.3%                         | 35.3%             |
| Respondents (n) | 112            | 63             | 30             | 97                           | 108                           | 205               |

The 65 percent of property owners or managers who reported being aware of energy efficiency programs were then asked if they had participated in an energy efficiency program in the last five years, and if not, why not. Two-thirds of these aware property owners reported participating in a program (Table 49). Self-reported participation was significantly higher among property owners in climate zones 5 and 6 (about 88 percent compared with 59 percent in climate zone 4). Participation was also reported to be somewhat higher in low-rise buildings.

**Table 49. Reported Participation in Any Energy Efficiency Program in Past Five Years (Base: Owners/Managers Aware of Energy Efficiency)**

Climate zone sample sizes are very small for climate zones 5 (about 90/14) and 6 (about 90/20) so comparisons by climate zone will not meet 90/10 confidence/precision. Totals may not sum to 100 percent due to rounding.

Source: Property owner/manager survey questions DP10

|                 | Climate Zone   |                |                | Low or High Rise             |                               |                   |
|-----------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories | Overall Statewide |
| Yes             | 58.5%          | 88.9%          | 87.5%          | 73.4%                        | 61.7%                         | 65.4%             |
| No              | 41.5%          | 11.1%          | 12.5%          | 26.6%                        | 38.3%                         | 34.6%             |
| Respondents (n) | 65             | 36             | 16             | 53                           | 64                            | 117               |

Of those who are both aware of energy efficiency and have participated in an energy efficiency program in the past five years, 40 percent report participating in a lighting program, 15 percent report participating in Multifamily Performance Program (MPP), and 14 percent report converting to natural gas (Table 50). Participation in lighting programs was highest in climate zone 4 (71 percent compared to about 38 percent in climate zones 4 and 5).

**Table 50. Reported Participation by Program: Owners/Managers Aware of Energy Efficiency and Participated in an Energy Efficiency Program in Past Five Years**

The “Other” category lists a wide range of 14 other different programs and measures. Climate zone sample sizes are very small for all climate zones so comparisons by all climate zones may not be reliable. Samples over 31 at least meet the 90/15 confidence/precision. Totals may not sum to 100 percent due to rounding.

*Source: Property owner/manager survey questions DP10\_1\_oth*

| Program                         | Climate Zone   |                |                | Low or High Rise             |                               |                   |
|---------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                 | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories | Overall Statewide |
| HVAC                            | 8.1%           | 9.7%           | 0%             | 6.8%                         | 8.6%                          | 8.0%              |
| Appliances                      | 2.7%           | 0%             | 14.3%          | 7.9%                         | 0%                            | 2.8%              |
| Energy audit                    | 8.1%           | 12.9%          | 14.3%          | 12.2%                        | 8.3%                          | 9.7%              |
| Windows/doors/weatherization    | 8.1%           | 16.1%          | 0%             | 14.5%                        | 7.0%                          | 9.6%              |
| Lighting                        | 37.8%          | 38.7%          | 71.4%          | 36.1%                        | 42.4%                         | 40.2%             |
| Water heating equipment         | 0%             | 3.2%           | 14.3%          | 3.6%                         | .7%                           | 1.7%              |
| Converting to natural gas       | 18.9%          | 0%             | 7.1%           | 11.9%                        | 14.3%                         | 13.5%             |
| Multifamily Performance Program | 13.5%          | 19.4%          | 7.1%           | 12.7%                        | 15.6%                         | 14.6%             |
| ENERGY STAR homes               | 0%             | 3.2%           | 0%             | 0%                           | 1.2%                          | 0.8%              |
| Water saving devices            | 8.1%           | 9.7%           | 7.1%           | 3.6%                         | 11.1%                         | 8.4%              |
| Thermostats                     | 5.4%           | 6.5%           | 7.1%           | 2.3%                         | 7.7%                          | 5.8%              |
| Other                           | 27.0%          | 22.6%          | 14.3%          | 14.0%                        | 31.1%                         | 25.1%             |
| Respondents (n)                 | 37             | 31             | 14             | 42                           | 40                            | 82                |

For several reasons, the participation rates in Table 50 are not directly comparable to participation rates reported by programs or arrived at based on program-specific evaluations, and should not be extrapolated to the population of buildings. First, this study focused only on sub-metered multifamily buildings, not all multifamily buildings. Second, the participation rates in Table 50 are only for those owners/managers aware of energy efficiency and having participated in energy efficiency programs in the past five years. Third, open-ended responses associated with “other” were sometimes not detailed enough to identify any specific program by name.

To further illustrate this point, participation in NYSERDA’s Multifamily Performance Program (MPP) was determined in a separate evaluation<sup>2</sup> to be less than one percent of all multifamily properties and about 6.6 percent of all tenant units since the program began in 2005. This is quite a bit lower than data in Table 50 that indicates a 14.6 percent participation rate among those owners/managers in the sample frame who were aware of energy efficiency and have participated in an energy efficiency program in the past five years mentioned MPP. Other such differences between program participation rates and this study may exist.

The researchers attempted to examine whether there was any response bias in this study towards buildings that have participated in energy efficiency programs. Further analysis of the data suggests actual participation rates among all respondents that are much lower than those listed in Table 50 for a subset of respondents. The researchers concluded that the Residential Baseline Study approach to the survey questions, the lack of a comprehensive data set on the proportion of master- and sub-metered buildings in the total population, and the expected lack of clarity around known/evaluated participation rates of master- and sub-metered buildings in all applicable programs limited the ability to ascertain and apply a specific weighting factor to the results. Among the more than one-half of the property owners and managers who believe energy efficiency improvements are needed, 53 percent said the main barrier to installing equipment was the initial cost (Table 51). Another 11 percent said the length of the payback period was a barrier. Note that 16 percent did say that they are in the process of making improvements.

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<sup>2</sup> Source: Summarized by Region from the NYSERDA Multifamily Performance Program/Process Evaluation and Market Characterization/2010-2014 Final Report.

**Table 51. Reason for Not Making Energy Efficiency Improvements by Climate Zone and Rise**

Sample sizes are very small for climate zone 6, so comparisons by climate zone may not be reliable. A sample size of 31 or more meets the 90/15 confidence/precision while 47 or more is at the 90/12. Totals may not sum to 100 percent due to rounding.

Source: Property owner/manager survey questions DP6

| Reason                            | Climate Zone   |                |                | Low or High Rise             |                               | Overall Statewide |
|-----------------------------------|----------------|----------------|----------------|------------------------------|-------------------------------|-------------------|
|                                   | Climate Zone 4 | Climate Zone 5 | Climate Zone 6 | Low Rise - 3 or Less Stories | High Rise - 4 or More Stories |                   |
| Initial purchase cost             | 52.1%          | 60.0%          | 50.0%          | 55.4%                        | 52.5%                         | 53.4%             |
| Tenant pays utility bill          | 2.8%           | 0%             | 0%             | 3.9%                         | 1.6%                          | 2.2%              |
| Length of payback period          | 11.3%          | 8.6%           | 7.1%           | 8.1%                         | 11.7%                         | 10.7%             |
| No rebate offered                 | 4.2%           | 2.9%           | 0%             | 5.5%                         | 3.2%                          | 3.8%              |
| Too intrusive                     | 1.4%           | 11.4%          | 7.1%           | 7.6%                         | 1.6%                          | 3.3%              |
| Other                             | 4.2%           | 2.9%           | 14.3%          | 2.6%                         | 5.1%                          | 4.4%              |
| Not really needed                 | 5.6%           | 11.4%          | 21.4%          | 8.5%                         | 6.7%                          | 7.2%              |
| No approval from upper management | 1.4%           | 0%             | 0%             | 0%                           | 1.6%                          | 1.1%              |
| Haven't gotten to it              | 12.7%          | 14.3%          | 0%             | 16.0%                        | 11.0%                         | 12.5%             |
| In the process                    | 18.3%          | 8.6%           | 7.1%           | 13.6%                        | 17.3%                         | 16.3%             |
| Recently took ownership           | 2.8%           | 5.7%           | 14.3%          | 4.2%                         | 3.5%                          | 3.7%              |
| Respondents (n)                   | 71             | 35             | 14             | 51                           | 69                            | 120               |

## Appendix A: Detailed Methodology

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|-------------------------------------------------------------------------------------------------------------------------|
| The detailed methodology for data collection conducted on the multifamily segment is included in Volume 5: Methodology. |
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### A.1 Multifamily Property Manager or Owner Surveys

#### A.1.1 Objectives

The multifamily property owner or manager telephone survey asked questions about the property types and size, common area equipment, as well as the presence of a commercial business at the property. The survey was also used to recruit property owners or managers for an on-site inspection of common areas and tenant units. Only multifamily buildings that did not contain commercial accounts in the multifamily building were eligible for the on-site inspections.

As noted in the discussion of Single Family and Tenant Surveys, the intent was to use the contact information for property manager or owners provided by tenants that were surveyed to identify a sample for this survey. In many cases, tenants were unable or unwilling to provide complete contact information. Tetra Tech and a NYSERDA intern looked up information provided on websites in an attempt to get more accurate information for the property owner or manager contacts. This process was time-consuming, but ultimately Tetra Tech was able to complete 219 telephone surveys, which was greater than the target of 200 and resulted in 67 completed on-site inspections.

#### A.1.2 Sampling Strategy

Table A-1 lists the completed property manager or owner surveys by region. Not surprisingly, New York City with the vast majority of multifamily dwelling units had the largest number of survey completes.

**Table A-1. Property Manager or Owner Survey Completes by Region**

| Region            | Survey Completes |
|-------------------|------------------|
| Southern Tier     | 12               |
| Capital District  | 17               |
| Mohawk Valley     | 8                |
| Mid-Hudson        | 16               |
| Long Island       | 13               |
| New York City     | 94               |
| Western New York  | 21               |
| Finger Lakes      | 19               |
| Central New York  | 9                |
| North Country     | 10               |
| Overall Statewide | 219              |

Table A-2 shows the number of tenant surveys (Web or telephone) used to generate contacts, the number of completed property manager or owner surveys, and the number of completed on-site inspections by climate zone for comparison purposes.

**Table A-2. Multifamily Property Owner or Manager Surveys and On-site Inspections by Construction Type and Climate Zone**

| Climate Zone   | Tenant Surveys                      |                                   |                   |  | Multifamily Building Surveys and On-site Inspections |                                                                   |                                          |
|----------------|-------------------------------------|-----------------------------------|-------------------|--|------------------------------------------------------|-------------------------------------------------------------------|------------------------------------------|
|                | Existing Construction (before 2012) | New Construction (2012 and after) | Overall Statewide |  | Property Owner or Manager Surveys                    | Existing Construction Multifamily Tenant Unit On-Site Inspections | Multifamily Building On-Site Inspections |
| Climate zone 4 | 249                                 | 2                                 | 251               |  | 120                                                  | 149                                                               | 35                                       |
| Climate zone 5 | 74                                  | 7                                 | 81                |  | 68                                                   | 99                                                                | 22                                       |
| Climate zone 6 | 45                                  | 2                                 | 47                |  | 31                                                   | 57                                                                | 10                                       |
| Total state    | 368                                 | 11                                | 379               |  | 219                                                  | 305                                                               | 67                                       |

The total number of existing construction multifamily tenant unit on-site inspections include the units that were visited but did not provide energy consumption waivers or energy consumption data. These units were not considered a completed on-site inspection since they did not provide this required information and therefore, did not receive an incentive. In addition to the 305 multifamily tenant unit on-site inspections in existing buildings (built before 2012), an additional 33 multifamily tenant unit on-site inspections were completed in new buildings (2012 and after).

### **A.1.3 Response Rates**

Table A-3 shows the disposition and response rates for the property manager or owner surveys. The response rate was 17.5 percent, while the cooperation rate was slightly more than 25 percent.

**Table A-3. Property Owner or Manager Survey Response Rate**

|                                                                                                                                                                                                                                                                        | Capital District | Central New York | Finger Lakes | Long Island  | Mid-Hudson   | Mohawk Valley | New York City | North Country | Southern Tier | Western New York | Total        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|------------------|--------------|--------------|--------------|---------------|---------------|---------------|---------------|------------------|--------------|
| Complete                                                                                                                                                                                                                                                               | 17               | 9                | 19           | 13           | 16           | 8             | 94            | 10            | 12            | 21               | 219          |
| Partial                                                                                                                                                                                                                                                                | 2                | 3                | 3            | 2            | 1            | 2             | 17            | 0             | 1             | 1                | 32           |
| Refusal                                                                                                                                                                                                                                                                | 19               | 11               | 22           | 23           | 15           | 10            | 67            | 5             | 17            | 45               | 234          |
| Invalid phone number                                                                                                                                                                                                                                                   | 8                | 3                | 21           | 19           | 34           | 22            | 106           | 10            | 7             | 22               | 252          |
| Residential line                                                                                                                                                                                                                                                       | 2                | 0                | 2            | 0            | 0            | 2             | 1             | 0             | 0             | 3                | 10           |
| Language barrier                                                                                                                                                                                                                                                       | 0                | 0                | 0            | 1            | 0            | 1             | 3             | 1             | 0             | 0                | 6            |
| Ineligible - deceased or incapable                                                                                                                                                                                                                                     | 0                | 0                | 0            | 1            | 0            | 1             | 2             | 0             | 0             | 3                | 7            |
| Ineligible - master metered                                                                                                                                                                                                                                            | 0                | 1                | 0            | 0            | 0            | 2             | 4             | 0             | 2             | 0                | 9            |
| Ineligible - single family                                                                                                                                                                                                                                             | 5                | 5                | 10           | 4            | 6            | 12            | 10            | 10            | 23            | 17               | 102          |
| Active sample - no answer, busy, callback, answering machine                                                                                                                                                                                                           | 22               | 24               | 14           | 15           | 1            | 21            | 31            | 9             | 2             | 14               | 153          |
| Number of attempts > 20                                                                                                                                                                                                                                                | 9                | 4                | 11           | 24           | 24           | 6             | 119           | 2             | 8             | 17               | 224          |
| Total                                                                                                                                                                                                                                                                  | 84               | 60               | 102          | 102          | 97           | 87            | 454           | 47            | 72            | 143              | 1,248        |
| <b>Response rate</b>                                                                                                                                                                                                                                                   | <b>20.2%</b>     | <b>15.0%</b>     | <b>18.6%</b> | <b>12.7%</b> | <b>16.5%</b> | <b>9.2%</b>   | <b>20.7%</b>  | <b>21.3%</b>  | <b>16.7%</b>  | <b>14.7%</b>     | <b>17.5%</b> |
| <b>Cooperation rate</b>                                                                                                                                                                                                                                                | <b>24.6%</b>     | <b>17.6%</b>     | <b>27.5%</b> | <b>16.7%</b> | <b>28.1%</b> | <b>16.7%</b>  | <b>28.4%</b>  | <b>37.0%</b>  | <b>30.0%</b>  | <b>21.4%</b>     | <b>25.2%</b> |
| Response rate is equal to the number of survey (telephone and Web) completes divided by total population. Cooperation rate is equal to the number of completed surveys divided by total population minus invalid phone number, residential line, and ineligible cases. |                  |                  |              |              |              |               |               |               |               |                  |              |

### A.1.4 Weighting

Whereas the sampling unit for the single family or tenant baseline survey was the building unit, the sampling unit for the Multifamily Property Owner or Manager Survey is at the building level and includes only buildings with at least five units. The sampling weight for each case in the survey sample accounts for the number of cases it represents in the sampling frame, based on the sample selection procedure.

To determine the number of low rise and high rise multifamily types with five or more units in the sample frame in order to calculate the weights, the telephone survey asked a number of questions to collect information on the number of units and number of stories in their building.

The final weights for the Multifamily Property Owner or Manager Surveys and details on the components weights used are presented in Table A-4.

**Table A-4. Property Owner or Manager Survey Weights**

| Climate Zone         | Population -<br>Number of<br>Buildings | Completed<br>Surveys | Multifamily<br>Property Owner<br>or Manager<br>Weights |
|----------------------|----------------------------------------|----------------------|--------------------------------------------------------|
| Climate zone 4       | 130,221                                | 120                  | 1085.175                                               |
| Climate zone 5       | 31,619                                 | 68                   | 464.9852941                                            |
| Climate zone 6       | 8071                                   | 31                   | 260.3548387                                            |
| Total New York State | 169,911                                | 219                  | —                                                      |

### A.1.5 Data Limitations and Suggestions for Future Studies

Some of the data limitations and suggested changes for future studies are:

- Using the tenant surveys to provide contacts for their multifamily property manager or owner was not very helpful, particularly for the Web-based surveys that did not allow for additional probing of responses. The contact information needed to be updated through other research efforts including Internet searches.
- The property manager or owner surveys were useful in identifying a list of possible contacts for multifamily on-site inspection data collection although other methods were needed to increase the sample to complete the target number of on-site inspections.

Some of the data limitations and suggested changes for future studies are:

- Property owner or managers are difficult to reach because they are in and out of the office without a consistent schedule. The beginning of the month is especially busy, with a lot of move-ins and move-outs. It took many attempts before reaching the right person and finding a time to talk with them. Email messages made this easier. Upon finding the correct person, GDS asked for their email address and sent them an email with the study information. As part of the email, GDS indicated that a response was needed and asked for the best day or time to call the respondent. This method helped engage the property owner or manager and was used to establish a definite time to call them back.
- Provide other services or information for the property manager or owner as an additional incentive for them to participate in the telephone survey and the on-site inspection. Later in the study, it was decided to offer an energy attribute report for the property manager or owner to participate in the on-site inspection. This could be offered earlier along with help in benchmarking their building or free training on how to optimize energy usage or participate in energy efficiency programs in New York State. More data would need to be collected to actually conduct the benchmarking of their buildings though.

## **A.2 Multifamily On-Site Inspection Data Collection**

### **A.2.1 Summary of Approach**

The approach for multifamily on-site inspections was:

- The property manager or developer or owner was the key contact for on-site inspection data collection including gaining access to a sample of dwelling units. As a result, multifamily (MF) tenants were not recruited individually for on-site inspection data collection during the Web or telephone survey to facilitate the process of gaining access to target number of units while at the site.
- The tenants from existing multifamily buildings who completed telephone or Web surveys were asked for the name and contact information of their property owner or manager. If the tenant did not or could not supply that information, the address was used to look-up any information on the property manager or owner using PLUTO, PropertyShark.com, apartment guide.com, or other similar websites.
- Using all of these sources, the evaluation team was able to complete telephone surveys with more than the target of 200 multifamily property managers or owners—219 property manager or owner telephone surveys were completed. The evaluation team then attempted to recruit the property manager or owner for the on-site inspection and provided the list to GDS to provide additional information and schedule the on-site inspection.

- The GDS recruiters asked the property manager or owner to help the inspectors gain access to collect data from a sample of tenant units as well as collect data on the common areas. The number of tenant units included for on-site inspection data collection in each multifamily building depended on the total number of units in that building. The on-site inspection data collection was expected to average five tenant units in the 50 buildings for a total target of 250 tenant units.
- Property managers or owners for existing multifamily buildings (built before 2012) were sent Amazon gift cards for \$150 plus \$40 for each tenant unit visited by the evaluation team (up to a specified number of units averaging five per multifamily building) for on-site inspection data collection. The property manager had the option of providing some of their incentive (e.g., \$20 gift card to the tenant units inspected) and keeping the remaining gift card.
- Property managers or owners for new multifamily buildings received a \$300 Amazon gift card. The expectation was that the on-site inspection data collection would focus on the whole building and mostly unoccupied tenant units would be used.
- New construction multifamily buildings for the 25 on-site inspection data collection targets were identified based on year of construction—built and occupied after 2012—from Web or telephone surveys with tenants in new construction buildings, telephone surveys with property owners or managers who also own new construction buildings, websites with property data, and other sources. Because of the difficulties in identifying and recruiting property owners of newly constructed multifamily buildings, this 25 building target was reduced. To be representative of the population of multifamily buildings statewide, NYSERDA approved a combined total of 17 additional existing and some new buildings. On-site data collection was successfully completed in a total of 58 existing buildings (281 individual tenant units) and nine newly constructed multifamily buildings. See Table A-5 for the geographic distribution of these completions.
- As described in the lessons learned section for future studies, recruiting property managers and collecting on-site data was far more challenging than anticipated, especially in the Downstate area.

### **A.2.2 Sampling Strategy**

Multifamily tenant units and multifamily buildings, including new construction, were identified as part of the property manager or owner telephone survey. The goal was to complete enough surveys to identify 50 existing multifamily buildings (built before 2012) and 25 new construction multifamily buildings (built and occupied in 2012 and after).

For the tenant on-site inspections, property managers completing the telephone survey were recruited for an on-site inspection of the common areas, as well as an average of five tenant units per building. It was not clear what the recruitment success rate would be for multifamily new construction. Therefore, the target number of on-site inspections listed from the RFP was higher than the actual number newly constructed multifamily building on-site inspections completed. With that in mind, the evaluation team

closely monitored the response rate in terms of actual completed on-site inspection data collection and increased the number of telephone surveys and property manager identification and outreach or recruitment activities to help ensure the revised on-site inspection data collection targets were met. To entice property managers to make their buildings available for on-site inspections, they were also offered building specific Energy Attribute Reports in addition to gift cards.

Information from utility residential electric accounts on new residential permanent service requests within multifamily buildings was not available to identify new construction prior to sampling. The telephone survey asked the respondent for the year of construction. Since an insufficient number of new construction buildings were identified in the random sample, the Tetra Tech Team tried multiple other sources to identify additional newly constructed buildings for the multifamily new construction on-site inspections. These sources included:

- Open house announcements
- Zillow.com
  - Put in location, filter to Apartments and Condos and built in 2012 or later, then research the addresses or developments to find property managers
- New construction developments
- New home developer websites
  - Usually list multiple sites they have recently completed which is a great way to find out the names and addresses for multiple sites.
- Apartment listing websites
  - Trulia, Zillow, craigslist, Renter Guide, apartmentlist.com, RentCity.com.

Given the difficulty in reaching new construction targets, the number of new construction buildings was reduced from 25 to 17 (existing and newly constructed buildings) and guidelines for completes were set by climate zone: eight buildings in climate zone 4, five buildings in climate zone 5, and four buildings in climate zone 6. These targets were based on the population of multifamily units in each of those three climate zones.

The original sample with target completes by region to reflect the amount of multifamily population is shown in Table A-5 along with the actual completes. The numbers of property manager or owner surveys completed are also shown by region with the number of those property manager or owners who agreed to a possible on-site inspection.

**Table A-5. Multifamily Property Surveys and Recruitment for On-site Inspections, Targets, and Completed On-site Inspections**

| Region           | Type     | Property Manager or Owner Survey Completes | On-site Inspections Recruits (Survey) (Buildings) | Target On-site Inspection Completes (Buildings) | Completed On-site Inspections Multifamily (Buildings) | Completed On-site Inspections Existing Multifamily (Tenant Units) |
|------------------|----------|--------------------------------------------|---------------------------------------------------|-------------------------------------------------|-------------------------------------------------------|-------------------------------------------------------------------|
| Southern Tier    | Existing | 12                                         | 8                                                 | 2                                               | 2                                                     | 11                                                                |
|                  | New      | 0                                          | 0                                                 | 0                                               | 0                                                     |                                                                   |
| Capital District | Existing | 16                                         | 9                                                 | 5                                               | 5                                                     | 21                                                                |
|                  | New      | 1                                          | 1                                                 | 4                                               | 2                                                     |                                                                   |
| Mohawk Valley    | Existing | 8                                          | 7                                                 | 2                                               | 2                                                     | 12                                                                |
|                  | New      | 0                                          | 0                                                 | 2                                               | 0                                                     |                                                                   |
| Mid-Hudson       | Existing | 15                                         | 10                                                | 5                                               | 5                                                     | 32                                                                |
|                  | New      | 1                                          | 0                                                 | 2                                               | 1                                                     |                                                                   |
| Long Island      | Existing | 13                                         | 10                                                | 2                                               | 2                                                     | 11                                                                |
|                  | New      | 0                                          | 0                                                 | 2                                               | 0                                                     |                                                                   |
| New York City    | Existing | 93                                         | 55                                                | 20                                              | 24                                                    | 96                                                                |
|                  | New      | 1                                          | 1                                                 | 5                                               | 4                                                     |                                                                   |
| Western New York | Existing | 21                                         | 10                                                | 5                                               | 5                                                     | 25                                                                |
|                  | New      | 0                                          | 0                                                 | 4                                               | 1                                                     |                                                                   |
| Finger Lakes     | Existing | 19                                         | 15                                                | 5                                               | 5                                                     | 32                                                                |
|                  | New      | 0                                          | 0                                                 | 2                                               | 1                                                     |                                                                   |
| Central New York | Existing | 9                                          | 6                                                 | 2                                               | 2                                                     | 9                                                                 |
|                  | New      | 0                                          | 0                                                 | 3                                               | 0                                                     |                                                                   |
| North Country    | Existing | 10                                         | 9                                                 | 2                                               | 6                                                     | 32                                                                |
|                  | New      | 0                                          | 0                                                 | 1                                               | 0                                                     |                                                                   |
| TOTAL            | Existing | 216                                        | 139                                               | 50                                              | 58                                                    | 281                                                               |
|                  | New      | 3                                          | 2                                                 | 25                                              | 9                                                     |                                                                   |

### A.2.3 Response Rates

The evaluation team aggressively pursued all leads in an effort to achieve the targeted number of multifamily existing buildings and new construction on-site inspections. As shown in Table A-6, including the 67 actual buildings where on-site inspections were conducted, a total of 363 leads were pursued, yielding a response rate of 18.5 percent. This response rate was only achievable through persistent calling of all contacts and supplemental contacts for each building, often resulting in five or more calls per building.

**Table A-6. Number of Buildings Pursued by Source of Lead**

| Source of Lead                                                         | Number of Buildings                         |
|------------------------------------------------------------------------|---------------------------------------------|
| Tetra Tech telephone surveys – buildings in queue, including inactives | 176                                         |
| Cold call leads from Tetra Tech                                        | 85                                          |
| Additional new construction building leads through cold calls          | 35                                          |
| Total number of on-site inspections completed                          | 67 (58 existing buildings, 9 new buildings) |
| Grand total                                                            | 363 total buildings in recruiting pool      |
| Response rate                                                          | 18.5% (67/363)                              |

### A.2.4 Weighting

Master-metered buildings were excluded from this study because these buildings are more closely aligned with commercial buildings and the associated energy using characteristics. It is important to note that the definitions used for this study most closely aligned with those used for code enforcement and NYSERDA staff for multifamily programs. Other data sources from U.S. Census, including American Community Survey and Residential Energy Consumptions survey, included master-metered buildings. In addition, the data was typically collected from the occupants in tenant units and not for the multifamily building. The use of multifamily occupant survey data from the U.S. Census was a concern in making comparisons to the residential baseline study results for heating and cooling systems. The multifamily U.S. Census data does not differentiate between central building systems and individual tenant unit systems. In addition, other sources for multifamily data were only at the national level and did not provide New York State data and did not provide definitions of multifamily in terms of number of units. Age of building was the one factor that could be used directly for comparison and there was a close match within 2 percentage points.

The residential baseline study had a specific definition for the multifamily population and the survey data was weighted according to New York State data on the number of multifamily units in counties. The sample data by county was rolled up to climate zone. It is a geographic weighting, which is all that can be done without comparable data from other sources to be used for weighting.

Tetra Tech primarily relied on the larger sample of tenant surveys and property manager and owner surveys for reporting baseline results. The sample was weighted using the same approach as other sample groups. The weighting relied on good administrative data that included the number of living units by county, which were rolled up to the climate zone and weighted at that level to represent the population of multifamily buildings in New York State. The multifamily on-site inspections were not used directly for the baseline analysis purposes due to the small number of 67 on-site inspections. The on-site inspection data was used for the potential analysis described in Volume 4.

### **A.2.5 Data Limitations and Suggestions for Future Studies**

The following elements of the methodology worked well for this study:

- GDS was able to schedule on-sites more easily when Tetra Tech completed the initial contact with the property manager or owner and gave that information to GDS to recruit for the on-site inspections.

Some of the data limitations and suggested changes for future studies are:

- Property owner or managers as well as homeowners are often interested in the gift cards as an incentive for participating in the survey, but ultimately they want to know how they can make their property more efficient (similar to an energy assessment). The project team ended up offering property owners or managers a summary report (Energy Attribute Report) as a way to engage them in the study and provide them some useful information in addition to the gift card. In addition, NYSERDA offered to provide a portfolio manager benchmarking.
- The suggestion was made to work through the property management associations to explain the study and ask them to request cooperation from their members. This suggestion came late in the study and could not be tried, so it is not clear if it could be a viable approach.

### **A.2.6 Other Lessons Learned**

Following are some additional lessons learned through the recruitment and data collection phases of this multifamily on-site inspection data collection effort. These lessons are grouped into two categories:

Recruitment Lessons and Data Collection Lessons.

#### **A.2.6.1 *Recruitment Lessons***

This section compiles the challenges encountered and strategies implemented by the evaluation team to address them.

Property management organizations are complex, and generally, different people within the organization are responsible for the approval, scheduling, and conducting of on-site inspections for multifamily buildings. These individuals are not likely to coordinate amongst themselves. To successfully complete the on-site inspections, it became necessary for the evaluation team to coordinate staff within the property management organization. This coordination is extremely time consuming but critical to ensuring that approval is secured from organization owners or managers, the on-site inspection is scheduled with the property manager within the organization, and the site supervisor (who was generally met on-site during the inspection) knows about the date or time of the on-site inspection and what they need to do to prepare.

Property management organizations receive many solicitations to purchase products or services through cold calls. It is critical to quickly affirm that this is a study, not a sales call or an obligation for any ongoing commitment after completing the on-site inspection.

Most organizations do not know NYSERDA by name or know what they do. Additionally, people who do know think mainly about incentive programs. It is extremely important to explain who NYSERDA is, what they do, and why they are conducting the study. In particular, it is important to mention that this is NOT an energy assessment but rather an inventory of their equipment.

The recruiter must waste no time getting to the direct and indirect benefits of participating in the study. It saves time to discuss the incentives and mission of the study up front, because most people will either participate just for the incentive or because they want to support the mission of the study. After securing their interest, the recruiter must walk the property manager through all of the on-site inspection requirements and ensure that nothing will be a “deal breaker.” This approach makes it harder for property managers to back out once they understand the depth of data collected and the amount of responsibility required by their staff.

The amount of responsibility required by organization staff was one of this study’s most difficult challenges. These individuals are generally not very motivated or are stretched thin just keeping up with their day-to-day workload. Thus, many property managers will not take the time and make the effort to accommodate the study because it provides very little direct benefit to them.

Finally, being persistent is essential. Very rarely will a recruiter get a call back or manage to reach the property manager on the first call. It often takes many attempts to determine who the right person to talk to is and to speak to them. However, the recruiter should not call more than once every two days to avoid irritating the contact.

#### **A.2.6.2      *Data Collection***

In general, the ease and completeness of data collection depended heavily on the level of professionalism and organization of the property management company. Thus, the best way to ensure the robustness of the data set was to plan ahead as much as possible.

Despite the fact that all property managers were informed multiple times of the process and what data would be required ahead of time via phone conversation and email, many were unprepared for the site inspector when he arrived on site. Check-in calls with the person accompanying the inspector three days and one day prior to each site on-site inspection to remind them of their responsibilities are absolutely critical to ensure a successful inspection.

Of all the data collected in the study, most property managers were fairly available. However, in many cases key data such as equipment capacities and efficiencies are not listed on the nameplate. It is helpful to have the site inspectors fill that information in immediately following the on-site inspection (if available from online sources) so the data set submitted is as complete as possible. However, in many cases the data for equipment in multifamily buildings are not listed or catalogued anywhere due to age.

Blower door tests proved difficult to perform, particularly in old multifamily buildings. In new buildings, the evaluation team was generally able to perform unit-specific blower door tests, which could be used to benchmark against ENERGY STAR<sup>®</sup> Homes results. However, in older buildings obtaining accurate results would either require a whole-building blower door test or a guarded test (using multiple blower doors to isolate leakage to the outside), neither of which was feasible for this study. These approaches may be possible for a small number of sites with an extremely cooperative property manager.

Another difficult piece of data to obtain was the utility consumption information. For common areas and central HVAC equipment, collecting energy consumption information often entailed coordinating with a completely different department within the property management organization. More often than not, subsequent follow up was required with a different department. It is helpful to understand who will be providing this information prior to the on-site inspection to request the data as soon as possible.

For information about tenant energy consumption, typically their most recent utility bill will show a 12-month consumption chart. To save time inside the tenant units, inspectors generally took a picture with the name, address, and account number followed by photos of the consumption charts. To ensure these data are available, it is best to survey units where the utility-paying tenant is at home, so they can also log in to their online utility accounts to access the data. GDS also asked property managers to request that tenants leave their bills on their kitchen table if they knew they would be out at the time of the on-site inspection. This request resulted in mixed success and is not a reliable approach to ensuring these data are procured.

## Appendix B: Single Family and Tenant Survey Instrument

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|                                                                                       |
|---------------------------------------------------------------------------------------|
| <b>NYSERDA RESIDENTIAL BASELINE STUDY</b><br><b>SINGLE FAMILY AND TENANT CODEBOOK</b> |
|---------------------------------------------------------------------------------------|

The survey modules included in this questionnaire are as follows:

- Introduction and Screening
- Building Shell
- ENERGY STAR Awareness
- Kitchen Appliances
- Heating and Cooling
- Water Heating
- Clothes Washing and Drying
- Home Lighting
- Small Household Appliances
- Miscellaneous Equipment
- Utility Company
- Demographics and Recruitment

NOTE:

- Variable names are in bold type.
- A code of (-2) means that the data was not gathered because the data was gathered by the in-person mini-survey during an onsite inspection instead of a phone or web survey.
- A code of (-3) means that the respondent's answer did not make sense with the metrics of the question.
- A code of (-4) means there was a system error because of the respondent (in the case of web interviewers) or interviewer (in the case of phone interviews) going back to previous questions in the survey and changed a responses that affected subsequent question skips.
- A code of (-5) means a respondent did not get asked that question because of a question being added or changed after fielding or a program skip error.
- A code of (-6) means programmed skip (i.e., a skip that was purposely programmed based on skip patterns).
- A code of (-8) means don't know.
- A code of (-9) means refused.
- Questions were asked of all respondents unless indicated otherwise.
- Categories were read to respondents.
- Respondents were allowed to leave questions blank to move forward in the survey. If a question was left blank or all categories of a question were left blank they were coded as - 9, refused. If a respondent answered some of the categories empty categories were assumed to be zero.
- Response codes with an asterisk (\*) are recoded responses to open-ended questions, or responses added during data cleaning.

| Sample and Analysis Variable List |
|-----------------------------------|
|-----------------------------------|

|                        |                                                  |
|------------------------|--------------------------------------------------|
| <b>[surveyID]</b>      | Unique case identifier                           |
| <b>[util]</b>          | Utility                                          |
| <b>[conty]</b>         | County                                           |
| <b>[region]</b>        | Region                                           |
| <b>[SampledRegion]</b> | Regions chronologically labeled by order sampled |
| <b>[ClimateZone]</b>   | Climate zone (4, 5, or 6)                        |

|                |                          |
|----------------|--------------------------|
| <b>[kwhct]</b> | kWh category             |
| 0              | 500 kWh or less          |
| 1              | 501 to 2,500 kWh         |
| 2              | 2,501 to 6,000 kWh       |
| 3              | 6,001 to 12,000 kWh      |
| 4              | 12,001 to 20,000 kWh     |
| 5              | 20,000 kWh or more       |
| -2             | Not asked in mini-survey |

|                |                                |
|----------------|--------------------------------|
| <b>[thrmc]</b> | Therm cat                      |
| 0              | 300 or less therms annually    |
| 1              | 300 to 600 therms annually     |
| 2              | 600 to 900 therms annually     |
| 3              | 900 to 1,200 therms annually   |
| 4              | 1,200 to 1,500 therms annually |
| 5              | 1,500 to 1,800 therms annually |
| 6              | 1,800 to 2,100 therms annually |
| 7              | 2,100 or more therms annually  |
| -2             | Not asked in mini-survey       |

|                |               |
|----------------|---------------|
| <b>[gsrtc]</b> | Gas rate code |
|----------------|---------------|

|                |                                                                                                                     |                            |                                                            |
|----------------|---------------------------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------------------------|
| [sample_type]  | Origin of initial case data                                                                                         |                            |                                                            |
|                | 1 thru 8                                                                                                            | Utility data               |                                                            |
|                | 99                                                                                                                  | Tax record data            |                                                            |
| [aapor]        | Final disposition of case                                                                                           |                            |                                                            |
|                | 1100                                                                                                                | phone complete             |                                                            |
|                | 1101                                                                                                                | web complete               |                                                            |
|                | 1103                                                                                                                | mini-survey complete       |                                                            |
| [Construction] | Flag of construction type                                                                                           |                            |                                                            |
|                | 3                                                                                                                   | Existing<br>(B7=11, 12,    | [IF B7<>11, 12, AND 13 OR IF<br>OR 13 AND IF B8spe<2012) ] |
|                | 1                                                                                                                   | New<br>B8spe>=2012         | [IF B7=11, 12, OR 13 AND IF<br>OR SKIPPED]                 |
| [Dwelling]     | Flag of dwelling type                                                                                               |                            |                                                            |
| [SKIPPED]      | 1                                                                                                                   | Single family              | [IF B3=1, 2, 3, 5, 6, OR WAS                               |
|                | 2                                                                                                                   | Tenant                     | [IF B3=4]                                                  |
| [Recruited]    | Flag of whether recruited for onsite scheduling or not                                                              |                            |                                                            |
|                | 0                                                                                                                   | Not recruited<br>(TENANT)] | [IF D7=3 or D7 NOT ASKED                                   |
|                | 1                                                                                                                   | Recruited                  | [IF D7=1 OR 2]                                             |
|                | -6                                                                                                                  | Programmed skip            | [D7 NOT ASKED]                                             |
| [SurveyWeight] | Computed survey weight, based on climate zone, new/existing construction, and single family or tenant dwelling type |                            |                                                            |

## INTRODUCTION

**INTRO (web)** Thank you for taking time out of your busy schedule to provide information on your household's energy use. As a token of our appreciation for completing this survey, we will be sending you a \$20 gift card after you have completed the survey.

We are surveying customers on behalf of New York State Energy Research and Development Authority (NYSERDA) in order to learn more about households' energy using equipment and their opinions on energy use. Please be assured that the information you provide will be kept confidential to the extent permitted by law. NYSERDA's analysis will only use summary level data and will not identify individual respondents or firms. This information will be used to design new products and energy efficiency programs to better help customers meet their energy needs and manage their energy costs.

If you have any questions about the content or use of this survey, you can call NYSERDA toll-free at 1-877-NYSMART (1-877-697-6278) or email [info@nyserda.ny.gov](mailto:info@nyserda.ny.gov)

Please enter in the box below the ID located in the upper right corner of the letter from NYSERDA and click "Begin" to enter the survey.

[Footer displayed on every page]

If you would like to complete the survey by phone or are experiencing other technical difficulties, please call Tetra Tech 800-454-5070 or by e-mailing [marie.nitschke@tetrattech.com](mailto:marie.nitschke@tetrattech.com).

You may exit the survey at any time and your answers will be saved. Reenter the same ID to come back and complete your survey.

For answers to frequently asked questions [Click Here](#) (A new window will open).

[Accessibility](#) | [Disclaimer](#) | [Internet Privacy Policy](#)

**INTRO (phone)** Hello, my name is \_\_\_\_\_ and I'm calling on behalf of NYSERDA.  
May I please speak with [FIRST NAME] [LAST NAME]?

This is not a sales call and we are not trying to change your utility provider. You may have recently received a letter or email regarding an important energy study NYSERDA is conducting to learn more about households' energy using equipment. As a token of our appreciation for participating we'll be sending you a \$20 gift card after completion of the survey. Our records show that your survey has not been completed. We would like to complete the survey over the phone. This information will be used to design new products and energy efficiency programs to better help customers meet their energy needs and manage their energy costs.

Please be assured that the information you provide will be kept confidential to the extent permitted by law. NYSERDA's analysis will only use summary level data and will not identify individual respondents or firms. For quality assurance and training purposes this call will be recorded.

[IF NEEDED: If you have any questions about the content or use of this survey, you can call NYSERDA toll-free at 1-877-NYSMART or email [info@nyserda.ny.gov](mailto:info@nyserda.ny.gov)]

## SCREENER

[Note: Skip for REP=99 added on 2/13/2014.]

**S1** [SKIP IF REP=99 (SUPPLEMENTAL NEW CONSTRUCTION SAMPLE)] To confirm, does [UTILITY] provide electric service to your home at [SERVICE ADDRESS]?

*(Check one)*

- 1 Yes [SKIP TO B1]
- 2 No, utility does not provide my electric service at that address
- 3 No, I no longer live at that address [SKIP TO TERM]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**S1spe** Who does provide electric service at [SERVICE ADDRESS]?

*(Specify utility below)*

[Note: Question added 2/13/2014.]

**S2** [SKIP TO B1 IF REP<99 (NOT SUPPLEMENTAL NEW CONSTRUCTION SAMPLE)] How many homes do you own in [COUNTY] county, NY?

- # of homes [1-50]
- 2 Not asked in mini-survey
- 6 Programmed skip

[Note: Question added on 2/13/2014.]

**S3** [IF S2>1: Please use the home in [COUNTY] county, NY which was most recently built to complete the remainder of the survey and indicate the address below.]

[IF S2<=1: Please indicate the address of this home below]

**S3A** Address:

**S3B** City:

**S3C** State:

**S3D** Zip:

[THE ADDRESS INDICATED HERE IS USED IN PLACE OF THE SERVICE ADDRESS FOR THE REMAINDER OF THE SURVEY.]

[Note: Question added on 2/13/2014.]

**S4** Do you occupy this home at least part of the year, or did your company build this home with the intent to sell it?

1 Occupy this home at least part of the year

2 Built the home with the intent to sell  
[TERMINATE]

-2 Not asked in mini-survey

-6 Programmed skip

[Note: Question added on 2/13/2014.]

**S5** Which utility company provides electric service to your home at [SERVICE ADDRESS]? *(Check one)*

- 1 Central Hudson
- 2 Con Edison (ConEd)
- 3 Long Island Power Authority (LIPA)
- 4 National Grid
- 5 New York State Electric and Gas (NYSEG)
- 6 Orange & Rockland (O&R)
- 7 Rochester Gas & Electric (RG&E)
- 8 None of the above – I no longer live at that address  
[TERMINATE]
- 2 Not asked in mini-survey
- 6 Programmed skip

## BUILDING SHELL

**B1** The size of your home, the number and type of appliances you own, and the number of people living in your home all affects the way you use energy. In this first set of questions, we would like to get some general information about your home at [SERVICE ADDRESS]. Do you own or rent this home? (*Check one*)

- 1 Own/buying
- 2 Rent
- 3 Occupied without payment of rent (e.g. Living with someone without making payment)
- 4 Other, specify
- 9 Refused

**o\_B1** [ASK IF B1=4] Description of other type of ownership.

**B2** How many months per year is this home usually occupied?  
(*Enter months below*)

- \_\_\_ # of months [0-12]
- 9 Refused

**B2b** [ASK IF B2 <= 9 months] During which seasons of the year is this home usually occupied? (*Select all that apply*)

For B2bc1 through B2bc5

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 9 Refused

**B2bc1** Spring

**B2bc2** Summer

**B2bc3** Fall

**B2bc4** Winter

**B2bc5** Varies (SPECIFY)

**o\_B2b** [ASK IF B2bc5=1] Description of occupation time period.

[Note: Option 2 changed from 'Single family attached house such as a duplex or townhouse' on 1/30/2014.]

**B3** Which of the following best describes this home? (*Check one*)

- 1 Single family detached house
- 2 Single family attached house such as a duplex, townhouse, or rowhouse
- 3 Apartment building or condominium with 2 to 4 units
- 4 Apartment building or condominium with 5 or more units
- 5 Mobile home
- 9 Refused

**B3a**

[ASK IF B3=2, 3 OR 4] Including your unit, how many individual housing units are in your [IF B3=2: in this attached rowhouse/townhouse] [IF B3=3 | 4: apartment or condominium building]? *(Enter number of units below)*

- \_\_\_\_\_ # of units [1-2000]
- 2 Not asked in mini-survey
  - 3 Nonsensical answer
  - 4 Interviewer / respondent error
  - 6 Programmed skip
  - 8 Don't know
  - 9 Refused

**B3b**

[ASK IF B3a = -8] Do you think the total number of housing units in your building is... *(Check one)*

- 1 Less than 5
- 2 5-49
- 3 50-99
- 4 100 or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**B3c**

[SKIP TO B4 IF B3<> 3 AND 4] Not counting the basement, how many stories are there in this apartment or condominium building? (*Enter number of stories below*)

- \_\_\_ # of stories [1-120]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**B3d**

Does your apartment or condominium have any shops, restaurants, other retail space, or space used by businesses? (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**B3e**

Is there more than one building in this apartment or condominium complex that includes other housing units? (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**B3f** [ASK IF B3e <> 2] In total, how many apartment or condominium buildings are at this location? (*Enter number of buildings below*)

\_\_\_ # of buildings [1-75]

-2 Not asked in mini-survey

-6 Programmed skip

-9 Refused

**B4** How many bedrooms are there in your home? (*Enter number of bedrooms below*)

\_\_\_ # of bedrooms [0-25]

-2 Not asked in mini-survey

-9 Refused

**B5** Not counting an unfinished basement, about how large is your home in square feet? (*Enter square footage of home below*)

\_\_\_\_\_ square feet [1-113,000]

-3 Nonsensical answer

-8 Don't know

-9 Refused

**B5a**

[ASK IF B5 = -8] Approximately how large is your home in square feet? Please do not include unfinished basements. *(Check one)*

- 1 Less than 1,000 square feet
- 2 1,000 to less than 1,500 square feet
- 3 1,500 to less than 2,000 square feet
- 4 2,000 to less than 2,500 square feet
- 5 2,500 to less than 3,000 square feet
- 6 3,000 to less than 4,000 square feet
- 7 4,000 or more square feet
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**B6**

[ASK IF B3 <> 3 OR 4] Does your home have a heated or unheated basement? *(Check one)*

- 1 Yes, a heated basement
- 2 Yes, an unheated basement
- 3 No basement
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**B7** In approximately what year was your home built? (*Check one*)

- 1 1939 or earlier
- 2 1940 to 1949
- 3 1950 to 1959
- 4 1960 to 1969
- 5 1970 to 1979
- 6 1980 to 1989
- 7 1990 to 1999
- 8 2000 to 2009
- 9 2010
- 10 2011
- 11 2012
- 12 2013
- 13 2014 (Invisible until 2014)
- 8 Don't know
- 9 Refused

**B8** Has your home undergone any major renovations or additions in the past five years? A major renovation or addition, means construction activities like adding a room, or increasing the size of your home's living space, or reconstruction due to flooding or hurricane. (*Check one*)

- 1 Yes
- 2 No [SKIP TO B9]
- 2 Not asked in mini-survey
- 8 Don't know [SKIP TO B9]
- 9 Refused

**B8spe** In what year was this renovation or addition completed? *(Enter year below)*

\_\_\_\_\_ year of renovation [2008-2014]

-2 Not asked in mini-survey

-6 Programmed skip

-9 Refused

**B9** [SKIP TO E1 IF B3 = 2, 3 OR 4] Do you have more than one electric meter at this address? *(Check one)*

1 Yes

2 No [SKIP TO E1]

-2 Not asked in mini-survey

-6 Programmed skip

-9 Refused

**o\_B9b** What equipment or building is hooked up to this other electric meter?  
*(Please specify other equipment or building below)*

## ENERGY STAR AWARENESS

**E1** Before asking about the energy using equipment in your home, we would like to ask about your familiarity with the ENERGY STAR® logo. The ENERGY STAR® logo is usually a blue and white sticker on an appliance that says “ENERGY STAR®” on it.

Equipment having the ENERGY STAR® logo meets strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy. Before now, were you not at all familiar, somewhat familiar, or very familiar with ENERGY STAR® or the ENERGY STAR logo®? *(Check one)*

- 1 Not at all familiar
- 2 Somewhat familiar
- 3 Very familiar
- 9 Refused

## KITCHEN APPLIANCES

**K1** How many of each of the following do you use in your home?  
*(If none, please enter zero)*

For K1a through K1d

— # of units [0-9]  
-9 Refused

- K1a** Microwave ovens
- K1b** Ovens with burners on top
- K1c** Separate stove tops
- K1d** Separate oven units

**K2** [SKIP IF K1b = 0 OR -9] What type of fuel does your oven(s) with burners on top use?

*(Select all that apply)*

For K2c1 through K2c4

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K2c1** Electricity

**K2c2** Natural gas from underground pipes

**K2c3** Propane (bottled gas)

**K2c4** Some other fuel, specify

**o\_K2** [ASK IF K2c4=1] Description of other type of fuel.

**K3** [SKIP IF K1c = 0 OR IS -9] What type of fuel does your separate stove top(s) use? *(Select all that apply)*

For K3c1 through K3c4

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K3c1** Electricity

**K3c2** Natural gas from underground pipes

**K3c3** Propane (bottled gas)

**K3c4** Some other fuel, specify

**o\_K3** [ASK IF K3c4=1] Description of other type of fuel.

**K4** [SKIP IF K1d=0 OR IS -9] What type of fuel does your separate oven(s) use?  
(Select all that apply)

For K4c1 through K4c4

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K4c1** Electricity

**K4c2** Natural gas from underground pipes

**K4c3** Propane (bottled gas)

**K4c4** Some other fuel, specify

**o\_K4** [ASK IF K4c4=1] Description of other type of fuel.

**K5** Which of the following best describes your primary refrigerator? *Please do not include wine coolers.*

- 1 Full-size with one door
- 2 Full-size with two doors, top freezer
- 3 Full-size with two doors, bottom freezer
- 4 Full-size with two doors, freezer next to the refrigerator (side by side)
- 5 Full-sized, two refrigerator doors and a freezer door on bottom (French style)
- 6 Half-size or compact
- 7 Other, specify
- 2 Not asked in mini-survey
- 9 Refused

**o\_K5** [ASK IF K5=7] Description of other type refrigerator.

**K5a** Does your primary refrigerator have an automatic ice maker? (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 9 Refused

**K5b** Does your primary refrigerator have a water dispenser? (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 9 Refused

**K6** About how old is your primary refrigerator? (*Check one*)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 8 Don't know
- 9 Refused

**K7** [SKIP IF (E1 <> 2 AND 3) OR (K6 = 4, 5, OR 6,) ] Is this refrigerator ENERGY STAR® rated? (e.g. Does it have the ENERGY STAR® logo on it?) (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K8** Do you have any other full-size or compact refrigerators plugged in and running in your home? Please do not include wine chillers. (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 9 Refused

**K9** [SKIP TO K11 IF K8 = 2] How many other refrigerators do you have plugged in and running in your home? (*If none, please enter zero*)

For K9 through K9a

- # of units [0-9]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**K9** Full size refrigerators

**K9a** Compact refrigerators

**K10a** [SKIP TO K11 IF (K9+K9a) = 0 OR -18] About how old is this second refrigerator? (*Check one*)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K10b** [SKIP TO K11 IF (K9+K9a) = 1 OR -8] About how old is this third refrigerator? (*Check one*)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K10c** [SKIP TO K11 IF (K9+K9a) = 2 OR -8] About how old is this forth refrigerator?  
(Check one)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K11** How many wine chillers/coolers do you have plugged in and running in your home? (If none, please enter 0) *(Enter number of wine chillers/coolers below)*

- # of units [0-9]
- 2 Not asked in mini-survey
- 9 Refused

**K11a** [SKIP IF (E1 <> 2 AND 3) OR (K11 =0 OR >1 OR MISSING)] Is this wine chiller ENERGY STAR® rated?  
(e.g. Does it have the ENERGY STAR® logo on it?) (*Check one*)

- 1 Yes
- 3 No
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K11b** [SKIP IF (E1=2 OR 3) OR (K11 =0 OR =1 OR MISSING)] Are these wine chillers ENERGY STAR® rated?  
(e.g. Do they have the ENERGY STAR® on them?) (*Check one*)

- 1 Yes, all
- 2 Yes, some
- 3 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K13** Does your household have a standalone freezer plugged in and running, one that is not part of a refrigerator? (*Check one*)

- 1 Yes
- 2 No [SKIP TO H1]
- 2 Not asked in mini-survey
- 9 Refused

**K14** How many standalone freezers do you have plugged in and running in your home? (*Enter number of freezers below*)

- \_ # of units [1-9]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**K15at** What type of freezer is this first standalone freezer? (*Check one*)

- 1 Chest
- 2 Upright
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**K15a** And what is the approximate age of this first standalone freezer? *(Please round to the nearest whole number, for an age less than one year please enter 0)*

- \_\_\_\_ # of years [0-100]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K15bt** [SKIP TO K17a IF K14 = 1] What type of freezer is this second standalone freezer? *(Check one)*

- 1 Chest
- 2 Upright
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**K15b** And what is the approximate age of this second standalone freezer? *(Please round to the nearest whole number, for an age less than one year please enter 0)*

- \_\_\_\_ # of years [0-100]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**K15ct** [SKIP TO K17b IF K14 = 2] What type of freezer is this third standalone freezer?  
(Check one)

- 1 Chest
- 2 Upright
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**K15c** And what is the approximate age of this third standalone freezer? *(Please round to the nearest whole number, for an age less than one year please enter 0)*

- \_\_\_ # of years [0-100]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

[Note: Skip changed to <=9 on 1/27/2014 to match other ENERGY STAR questions.]

**K17a** [ASK IF K14 = 1 AND (E1 = 2 OR 3) AND (K15a<=9 OR K15a=-8) ] Is this standalone freezer ENERGY STAR® rated? (e.g. Does it have the ENERGY STAR® logo on it?)

*(Check one)*

- 1 Yes
- 3 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

[Note: Skip changed to <=9 on 1/27/2014 to match other ENERGY STAR questions.]

**K17b** [SKIP IF K14=1 OR (E1 <> 2 AND 3) OR (K14=2 AND K15a>9 AND K15a<>-8 AND K15b>9 AND K15b<>-8) OR (K14>2 AND K15a>9 AND K15a<>-8 AND K15b>9 AND K15b<>-8 AND K15c>9 AND K15c<>-8) ] Are these standalone freezers ENERGY STAR® rated? (e.g. Does it have the ENERGY STAR® logo on it?)

- 1 Yes, all
- 2 Yes, some
- 3 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

## HEATING AND COOLING

**H1** [ASK IF B3 = 3 OR 4] Do you receive your primary heat from a central heating system that is used by other families in your apartment building or condominium building?

*(Check one)*

- 1 Yes [SKIP TO H7a]
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know [SKIP TO H7a]
- 9 Refused

**H2**

What is the primary type of fuel used for heating your home? (*Check one*)

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 District Steam
- 5 Fuel oil
- 6 Kerosene
- 7 Wood/wood pellets
- 8 Solar
- 9 Geothermal
- 10 Other, specify
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_H2**

[ASK IF H2=10] Description of other type of primary fuel type.

**H3**

What type of primary heating system do you have in your home? *(Check one)*

- 1 Central forced air furnace with ducts to individual rooms
- 2 Steam/hot water system with radiators or pipes in each room (central boiler)
- 3 District steam with radiators or pipes in each room
- 4 Air source Heat pump
- 5 Ground source Heat pump
- 6 Baseboard heat
- 7 Heating stove burning wood or coal
- 8 Fireplace
- 9 Portable electric heater
- 10 Portable kerosene heater
- 11 Solar panels
- 12 Other, specify
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_H3**

[ASK IF H3=12] Description of other type of primary heating system

**H4**

About how old is your primary heating system? (*Check one*)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**H5**

[ASK IF E1 = 2 OR 3 AND H4 <> 4, 5, AND 6] Is your primary heating system ENERGY STAR® rated? (e.g. Does it have the ENERGY STAR® logo on it?)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

[Note: Option 5 added 12/10/2014]

**H6** Do you usually have a tune up done on your heating system each year by a heating contractor, by someone in your household or by your landlord? (*Check one*)

- 1 Yes, done by a heating contractor
- 2 Yes, done by someone in the household
- 5 Yes, done by landlord
- 3 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

[Note: H7ap added on 11/26/2013. Question is code -5 for cases completed before 11/26/2013.]

**H7a**                      How many wood, natural gas, or electric fireplaces do you use in your home on a regular basis in the winter? *(If none, please enter zero)*

For H7aw through H7ae

|    |                          |       |
|----|--------------------------|-------|
| —  | # of units               | [0-9] |
| -2 | Not asked in mini-survey |       |
| -5 | Programming change       |       |
| -9 | Refused                  |       |

**H7aw**                      Wood fireplaces

**H7ag**                      Natural gas fireplaces

**H7ap**                      Propane fireplaces

**H7ae**                      Electric fireplaces

**H7**                      How many of the following do you use in your home on a regular basis in the winter?

*(If none, please enter zero)*

For H7b through H7d

|    |                          |       |
|----|--------------------------|-------|
| —  | # of units               | [0-9] |
| -2 | Not asked in mini-survey |       |
| -9 | Refused                  |       |

**H7b**                      Heat stoves (e.g. wood stove or pellet stove)

**H7c**                      Portable electric heaters

**H7d**                      Portable kerosene heaters

**H8** Do you use any other type of heating fuel to heat your home on a regular basis?  
(Check one)

- 1 Yes
- 2 No [SKIP TO H9]
- 2 Not asked in mini-survey
- 9 Refused

**H8a** What other fuels do you use on a regular basis to heat with? (Select all that apply)

For H8ac1 through H8ac9

- 0 Not mentioned
- 1 Mentioned
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

- H8ac1** Electricity
- H8ac2** Natural gas from underground pipes
- H8ac3** Propane (bottled gas)
- H8ac4** District Steam
- H8ac5** Fuel oil
- H8ac6** Kerosene
- H8ac7** Wood/wood pellets
- H8ac8** Solar
- H8ac9** Other, specify

**o\_H8a** [ASK IF H8ac9=1] Description of other type of fuel used.

**H9**

Do you have air conditioning in your home? Please include central air conditioning as well as room or window units. *(Check one)*

- |    |                          |               |
|----|--------------------------|---------------|
| 1  | Yes                      |               |
| 2  | No                       | [SKIP TO H19] |
| -2 | Not asked in mini-survey |               |
| -9 | Refused                  |               |

**H10**

[ASK IF B3 = 3 OR 4] Do you receive your air conditioning from a central cooling system that is used by other families in your apartment or condominium building?  
*(Check one)*

- |    |                          |               |
|----|--------------------------|---------------|
| 1  | Yes                      | [SKIP TO H15] |
| 2  | No                       |               |
| -2 | Not asked in mini-survey |               |
| -6 | Programmed skip          |               |
| -8 | Don't know               | [SKIP TO H15] |
| -9 | Refused                  |               |

**H11** What is the primary type of air conditioning equipment you use in your home?  
(Check one)

- 1 Central air conditioning system
- 2 Room or window air conditioner
- 3 Heat pump
- 4 Other, specify [SKIP TO H15]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_H11** [ASK IF H11=4] Description of other type of primary air conditioning equipment

**H12** About how old is your primary air conditioner system?  
(Check one)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**H13** [ASK IF E1 = 2 OR 3 AND H12 <> 4, 5, AND 6] Is your primary air conditioning system ENERGY STAR® rated?  
(e.g. Does it have the ENERGY STAR® logo on it?) (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

[Note: Option 5 added on 12/10/2013]

**H14** [ASK IF H11 = 1 OR 3] Do you usually have a tune up done on your air conditioning system each year by an air conditioning contractor, by someone in your household or by your landlord? (*Check one*)

- 1 Yes, done by an air conditioning contractor
- 2 Yes, done by someone in the household
- 5 Yes, done by landlord
- 3 No
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**H15** Do you use any other type of air conditioning system to cool your home? Please do not include ventilation systems, such as fans. *(Check one)*

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**H16** home? [ASK IF H15=1] What other types of air conditioning systems do you use in your home?

*(Select all that apply)*

For H16c1 through H16c4

- 0 Not mentioned
- 1 Mentioned
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**H16c1** Central air conditioning system

**H16c2** Room or window air conditioner

**H16c3** Heat pump

**H16c4** Other, specify

**o\_H16** [ASK IF H16c4=1] Description of other type of air conditioning systems used.

**H17** [ASK IF H11 = 2 or H16c2=1] In total, how many room or window air conditioners do you use in your home? *(Enter number of room air conditioners below)*

- \_ # of units [0-9]
- 2 Not asked in mini-survey
- 3 Nonsensical answer
- 4 Interviewer / respondent error
- 6 Programmed skip
- 9 Refused

**H19** Do you have a programmable thermostat that can control your heating and/or cooling equipment? This type of thermostat can be programmed to automatically adjust the temperature setting at the times of the day or night that you choose. *(Check one)*

- 1 Yes
- 2 No [SKIP TO H22]
- 2 Not asked in mini-survey
- 9 Refused

**H20** Is your thermostat typically programmed to automatically change the temperature settings at different times of the day or days of the week, OR do you manually change the temperature as needed? *(Check one)*

- 1 Programmed to change temperature automatically
- 2 Manually change the temperature
- 3 Both
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**H22** How many dehumidifiers do you use in your home? *(Enter 0 if do not use any)*

- # of units [0-9]
- 2 Not asked in mini-survey
- 9 Refused

**H23** About how old is this ...  
*(Check one)*

For H23a through H23d

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**H23a** [SKIP TO H26 IF H22 = 0 OR -9] first dehumidifier?

**H23b** [SKIP TO H24a IF H22 = 1] second dehumidifier

**H23c** [SKIP TO H24b IF H22 = 2] third dehumidifier

**H23d** [SKIP TO H24b IF H22 = 3] fourth dehumidifier

**H24a**

[SKIP IF H22<>1 OR (E1 <> 2 OR 3) OR (H23a = 4, 5, OR 6) ]

Is this dehumidifier ENERGY STAR<sup>®</sup> rated?

(e.g. Does it have the ENERGY STAR<sup>®</sup> logo?) (*Check one*)

- 1 Yes
- 3 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**H24b**

[SKIP IF H22=1 OR (E1 <> 2 OR 3) OR

{H22=2 AND (H23a>3 AND H23a<>7 AND H23b>3 AND H23b<>7)} **OR**

{H22=3 AND (H23a>3 AND H23a<>7 AND H23b>3 AND H23b<>7 AND H23c=>3 AND H23c<>7)} **OR**

{H22>3 AND (H23a>3 AND H23a<>7 AND H23b>3 AND H23b<>7 AND H23c=>3 AND H23c<>7 AND H23d>3 AND H23d<>7)} ]

Are these dehumidifier(s) ENERGY STAR<sup>®</sup> rated?

(e.g. Does they have the ENERGY STAR<sup>®</sup> logo on them?) (*Check one*)

- 1 Yes, all
- 2 Yes, some
- 3 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**H26** How many humidifiers do you use in your home? *(Enter 0 if you do not have any)*

— # of units [0-9]  
-2 Not asked in mini-survey  
-9 Refused

**H27** How many of the following types of ventilation equipment do you have in your home...

*(If none, please enter zero)*

For H27c through H27a

— # of units [0-25]  
-2 Not asked in mini-survey  
-9 Refused

**H27c** Ceiling fans?

**H27d** Exhaust fans in the kitchen?

**H27e** Exhaust fans in the bathrooms or another room?

**H27b** An attic fan in your home? An attic fan removes air from the attic only.

**H27a** A whole house fan? A whole-house fan is a type of fan, or exhaust system commonly venting into a building's attic, designed to pull hot air out of the building.

## WATER HEATING

**WH1** [ASK IF B3 = 3 OR 4] Do you receive your hot water from a central hot water heating system that is used by other families in your apartment or condominium building?

*(Check one)*

- |    |                          |               |
|----|--------------------------|---------------|
| 1  | Yes                      | [SKIP TO WH6] |
| 2  | No                       |               |
| -2 | Not asked in mini-survey |               |
| -6 | Programmed skip          |               |
| -8 | Don't know               | [SKIP TO WH6] |
| -9 | Refused                  |               |

**WH2**  
*one)* What type of system do you use as your primary water heating system? *(Check*

- |    |                                    |
|----|------------------------------------|
| 1  | Stand-alone storage tank           |
| 2  | Tankless or on demand water heater |
| 3  | Heat pump water heater             |
| 4  | Part of the heating system boiler  |
| 5  | Other, specify                     |
| -2 | Not asked in mini-survey           |
| -6 | Programmed skip                    |
| -8 | Don't know                         |
| -9 | Refused                            |

**o\_WH2** [ASK IF WH2=5] Description of other type of primary water heating system used.

**WH3**

What type of fuel does your primary hot water heater use? (*Check one*)

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 District Steam
- 5 Fuel Oil
- 6 Kerosene
- 7 Solar
- 8 Other, specify
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_WH3**

[ASK IF WH3=8] Description of other type of primary water heating fuel used.

**WH4**

About how old is your primary water heating system? (*Check one*)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**WH5**

[ASK IF (E1 = 2 OR 3) AND (WH2=1 OR 4) AND (WH4 <> 4, 5, AND 6) ]

Is this water heating system ENERGY STAR® rated?

(e.g. Does it have the ENERGY STAR® logo on it?) (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**WH6**

[SKIP TO WH8 IF WH2=4] Do you use more than one water heating system in your home? *(Check one)*

- 1 Yes
- 2 No [SKIP TO WH8]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know [SKIP TO WH8]
- 9 Refused

**WH7**

What other type of system do you use as your primary water heating system? *(Check one)*

- 1 Stand-alone storage tank
- 2 Tankless or on demand water heater
- 3 Heat pump water heater
- 4 Part of heating system boiler
- 5 Other, specify
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**o\_WH7**

[ASK IF WH7=5] Description of other type of water heating system.

**WH8** Do you have an automatic dishwasher? *(Check one)*

- 1 Yes
- 2 No [SKIP TO C1a]
- 2 Not asked in mini-survey
- 9 Refused

**WH9** Approximately how old is your primary automatic dishwasher?  
*(Check one)*

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**WH10**

[ASK IF (E1 = 2 OR 3) AND WH9 <> 4, 5, OR 6]

Is this automatic dishwasher ENERGY STAR® rated?

(e.g. Does it have the ENERGY STAR® logo on it?) *(Check one)*

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

[Note: Allowable number of loads increased to 35 on 12/2/2013]

**WH11**

Approximately how many loads of dishes does your household wash in a typical week in the automatic dishwasher [If home occupied < 12 months a year - , while the home is occupied]? *(Enter number of loads below)*

- \_\_\_ # of loads [0-35]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

## CLOTHES WASHING AND DRYING

**C1a** [SKIP IF B3 = 3 OR 4] Do you have a clothes washer in your home?

- |    |                          |               |
|----|--------------------------|---------------|
| 1  | Yes                      | [SKIP TO C3]  |
| 2  | No                       | [SKIP TO C7a] |
| -2 | Not asked in mini-survey |               |
| -6 | Programmed skip          |               |
| -9 | Refused                  |               |

**C1b** [ASK IF B3 = 3 OR 4] Please Do not include clothes washers that are located in a laundry room of your apartment or condominium building.] (Check one)

- |    |                          |               |
|----|--------------------------|---------------|
| 1  | Yes                      |               |
| 2  | No                       | [SKIP TO C7a] |
| -2 | Not asked in mini-survey |               |
| -6 | Programmed skip          |               |
| -9 | Refused                  |               |

[Note: Allowable number of loads increased to 35 on 12/2/2013]

**C3** Approximately how many loads of laundry does your household wash in a typical week [If home occupied < 12 months a year- , while the home is occupied]?

*(Enter number of loads below)*

- |     |                          |        |
|-----|--------------------------|--------|
| ___ | # of loads               | [0-35] |
| -2  | Not asked in mini-survey |        |
| -6  | Programmed skip          |        |
| -8  | Don't know               |        |
| -9  | Refused                  |        |

**C4** What water temperature setting do you usually use for the wash cycle of your clothes washer? *(Check one)*

- 1 Hot
- 2 Warm
- 3 Cold
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C5** What water temperature setting do you usually use for the rinse cycle of your clothes washer? *(Check one)*

- 1 Hot
- 2 Warm
- 3 Cold
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C6**

About how old is your primary clothes washer? (*Check one*)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C6b**

[ASK IF (E1 = 2 OR 3) AND C6 <> 4, 5, AND 6 ]

Is this clothes washer ENERGY STAR<sup>®</sup> rated?

(e.g. Does it have the ENERGY STAR<sup>®</sup> logo on it?) (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C7a** [SKIP IF B3 = 3 OR 4] Do you have a clothes dryer in your home? (*Check one*)

- |    |                          |              |
|----|--------------------------|--------------|
| 1  | Yes                      | [SKIP TO C8] |
| 2  | No                       | [SKIP TO L2] |
| -2 | Not asked in mini-survey |              |
| -6 | Programmed skip          |              |
| -9 | Refused                  |              |

**C7b** [ASK IF B3 = 3 OR 4] Do you have a clothes dryer in your home? Please do not include community clothes dryers that are located in a laundry room of your apartment or condominium building. (*Check one*)

- |    |                          |              |
|----|--------------------------|--------------|
| 1  | Yes                      |              |
| 2  | No                       | [SKIP TO L2] |
| -2 | Not asked in mini-survey |              |
| -6 | Programmed skip          |              |
| -9 | Refused                  |              |

**C8** What type of fuel does your primary clothes dryer use? (*Check one*)

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Other, specify
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_C8** [ASK IF C8=4] Description of other type of fuel used for clothes drying.

**C9** About how old is your clothes dryer? (*Check one*)

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C10**

Is your clothes dryer a heat pump clothes dryer? A heat pump clothes dryer is a fairly new technology that pulls energy from the air just like a heat pump heating and cooling system. The hot air is not vented but is reused to dry the clothes. They use 50% less energy, but take longer to dry clothes. *(Check one)*

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

#### HOME LIGHTING

**L2** Do you use any of the following natural lighting in your home during the day?  
*(Select all that apply)*

For L2c1 through L2c4

- 0 Not mentioned
- 1 Mentioned
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**L2c1** Skylights

**L2c2** Tubular skylights, also referred to as solar tubes or sun tunnels (What is that?)

**L2c3** Large uncovered window areas

**L2c4** None of the above

**L3**  
home?

Which of the following types of lighting controls do you use inside or outside your

*(Select all that apply)*

For L2c1 through L2c4

- 0 Not mentioned
- 1 Mentioned
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

- L3c1** Dimmer switch
- L3c2** 3-way bulb
- L3c3** Occupancy/motion sensor
- L3c4** Timer
- L3c5** None of the above

**L4** Compact fluorescent light bulbs – also known as CFLs – usually do not look like regular incandescent bulbs. The most common type of CFL is made with a glass tube bent into a spiral shape and fits in a regular light bulb socket. [Picture of CFL] Before today, were you familiar with CFLs? *(Check one)*

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 9 Refused

**L4a** LED light bulbs give off directional light, so the light goes where you aim it. They are also very energy efficient and can work with dimmable switches. [Picture of LED] Before today, were you familiar with LED light bulbs? *(Check one)*

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 9 Refused

**L5** How many light bulbs inside your home are typically used two or more hours each day?

*(Enter number of bulbs below. If none, please enter zero)*

For L5a through L5c

- \_\_\_ # of bulbs [0-99]
- 2 Not asked in mini-survey
- 8 Don't know
- 9 Refused

**L5a** CFL/LED Bulbs

**L5b** Incandescent Bulbs

**L5c** Other bulbs

**L7** How many light bulbs outside your home are typically used 2 or more hours each day? [IF B3= 2 OR 3 OR 4 – Please include only lights that are controlled from your [HOME TYPE]] *(Enter number of bulbs below)*

- \_\_\_ # of bulbs [0-95]
- 2 Not asked in mini-survey
- 9 Refused

**L8**

[ASK IF (L4 OR L4a = 1) AND L7 <> 0 OR -9] How many of the [L7] outdoor lights used two or more hours each day are CFL or LED lights?  
(Enter number of bulbs below)

|               |                          |        |
|---------------|--------------------------|--------|
| <u>      </u> | # of bulbs               | [0-95] |
| -2            | Not asked in mini-survey |        |
| -6            | Programmed skip          |        |
| -8            | Don't know               |        |
| -9            | Refused                  |        |

## POOL AND SPA

**P1A** [SKIP IF B3 = 3 OR 4] Do you have a swimming pool with a filtering system for your use only? (*Check one*)

- |    |                          |               |
|----|--------------------------|---------------|
| 1  | Yes                      | [SKIP TO P2]  |
| 2  | No                       | [SKIP TO P4a] |
| -2 | Not asked in mini-survey |               |
| -6 | Programmed skip          |               |
| -9 | Refused                  |               |

**P1B** [ASK IF B3 = 3 OR 4] Do you have a swimming pool with a filtering system for your use only? Please do not include a pool that is shared with others in your apartment or condominium complex. (*Check one*)

- |    |                          |               |
|----|--------------------------|---------------|
| 1  | Yes                      |               |
| 2  | No                       | [SKIP TO P4a] |
| -2 | Not asked in mini-survey |               |
| -6 | Programmed skip          |               |
| -9 | Refused                  |               |

**P2** Do you have a pool pump? (*Check one*)

- |    |                          |
|----|--------------------------|
| 1  | Yes                      |
| 2  | No                       |
| -2 | Not asked in mini-survey |
| -6 | Programmed skip          |
| -9 | Refused                  |

**P2b**  
*one)*

[SKIP TO P3 IF P2 <> 1] Is the pool pump a high efficiency pool pump? (*Check*

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**P2c**

Do you have an automatic timer that controls the time of day that your pool pump operates? (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**P3**

Do you have a pool heater? (*Check one*)

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

[SKIP TO P4a]

**P3b** What type of fuel does the pool heater use? (*Check one*)

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Solar
- 5 Other fuel, specify
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_P3b** [ASK IF P3b=5] Description of other pool heater fuel.

**P4a** [SKIP IF B3 = 3 OR 4] Do you have a hot tub, spa, or jetted tub/Jacuzzi for your use only? (*Check one*)

- 1 Yes [SKIP TO P5]
- 2 No [SKIP TO A2]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**P4b**

[ASK IF B3 = 3 OR 4] Do you have a hot tub, spa, or jetted tub/Jacuzzi for your use only? Please do not include a community hot tub, spa, or Jacuzzi that is shared with others in your apartment or condominium complex. *(Check one)*

- 1 Yes
- 2 No [SKIP TO A2]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**P5**

What type of fuel is used to heat the water in your hot tub, spa, or jetted tub/Jacuzzi? *(Check one)*

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Solar
- 5 Other fuel, specify
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_P5** [ASK IF P5=5] Description of other type of fuel used for hot tub heating.

## SMALL HOUSEHOLD APPLIANCES

[Note: Option A2e added on 11/11/2013. Cases completed before date are coded -5.]

**A2** How many televisions used in your home are of each of the following types?  
(If none, please enter zero)  
I'm unsure what type of TV I have? (Click here, a new window will open)

For A2a through A2d

|    |                          |        |
|----|--------------------------|--------|
| —  | # of TVs                 | [0-20] |
| -2 | Not asked in mini-survey |        |
| -5 | Programming change       |        |
| -9 | Refused                  |        |

|            |                                |
|------------|--------------------------------|
| <b>A2a</b> | Standard tube TVs              |
| <b>A2b</b> | Flat screen Plasma TVs         |
| <b>A2c</b> | Flat screen LCD/LED TVs        |
| <b>A2e</b> | Flat screen TV of unknown type |
| <b>A2d</b> | Rear projection TVs            |

[Note: Option A3e added on 11/11/2013. Cases completed before date are coded -5.]

**A3** Of the [A2 NUMBER AND TYPE] televisions used in your home, how many are used at least 2 hours every day? (*Enter number of televisions below*)

For A3a through A3d

\_\_\_ # of TVs used at least 2 hours every day [0-20]  
-5 Programming change  
-6 Programmed skip  
-9 Refused

**A3a** [SKIP IF A2a = 0 OR -9] Standard tube TVs

**A3b** [SKIP IF A2b = 0 OR -9] Flat screen Plasma TVs

**A3c** [SKIP IF A2c = 0 OR -9] Flat screen LCD/LED TVs

**A3e** [SKIP IF A2e = 0 OR -9] Flat screen TV of unknown type

**A3d** [SKIP IF A2d = 0 OR -9] Rear Projection TVs

**A6** Do you have internet access at home? (*Check one*)

1 Yes  
2 No  
-2 Not asked in mini-survey  
-9 Refused

[Note: Option A7l added on 11/25/2013. Cases completed before date coded as -5]

[Note: A7g changed from 'Combination printer/copier/scanner/fax on 11/25/2013]

**A7** How many of each of the following types of computer and home office equipment does your household use? *(If none, please enter zero. Please scroll down to see all computers and home office equipment.)*

For A7a through A7l

— # of equipment [0-20]

-5 Programming change

-9 Refused

|            |                                                                    |
|------------|--------------------------------------------------------------------|
| <b>A7a</b> | Desktop computer (excluding monitor)                               |
| <b>A7d</b> | CRT computer monitors (What is a CRT monitor?)                     |
| <b>A7e</b> | LED/LCD flat screen computer monitors (What is a LED/LCD monitor?) |
| <b>A7b</b> | Laptop computer                                                    |
| <b>A7c</b> | iPads, tablet computers                                            |
| <b>A7f</b> | eReaders such as a Kindle or Nook                                  |
| <b>A7g</b> | Combination printer, copier, scanner, or fax                       |
| <b>A7h</b> | Individual printer                                                 |
| <b>A7i</b> | Individual copier                                                  |
| <b>A7j</b> | Individual fax machine                                             |
| <b>A7k</b> | Individual scanner                                                 |
| <b>A7l</b> | Modems or routers                                                  |

**A7o** Any other type of computer or home office equipment?

1 Yes [SPECIFY]

2 No [SKIP TO A8]

**o\_A7oop** [ASK IF A7o=1] Description of other type of computer or office equipment.

**A8** Do you use a smart strip in your home to turn off computers, printers, and other equipment when not in use? Smart strips are different from regular power strips. They incorporate additional technologies to automatically disconnect power to equipment when not in use. (*Check one*)

1 Yes

2 No

-2 Not asked in mini-survey

-8 Don't know

-9 Refused

**A8a** [ASK IF A8 <> 2 AND -8] Do you have a Tier 1 or Tier 2 smart strip, or both? Tier 1 smart strips are controlled by a master outlet and Tier 2 smart strips are controlled by motion sensing or a timer. (*Check one*)

1 Tier 1 smart strip that turn off when your computer is powered off or goes to sleep

2 Tier 2 smart strip that turns off when you leave or is programmed to turn off at a certain time of the night or day

3 Both Tier 1 and Tier 2 smart strip

-2 Not asked in mini-survey

-6 Programmed skip

-8 Don't know

-9 Refused

**A9a**

[SKIP IF A7a = 0 OR -9] About how many hours each day do all residents typically use the desktop computer(s) in your home? (*Enter number of hours below*)

- \_\_\_ # of hours per day on average, per computer [0-24]
- 4 Interviewer / respondent error
- 6 Programmed skip
- 9 Refused

**A9b**

[SKIP IF A7b = 0 OR -9] About how many hours each day do all residents typically use the laptop computer(s) in your home? (*Enter number of hours below*)

- \_\_\_ # of hours per day on average, per computer [0-24]
- 4 Interviewer / respondent error
- 6 Programmed skip
- 9 Refused

**A10**

[SKIP IF A7a AND A7b = 0 OR -9] When you are not using your computer, do you typically shut down the computer? This is not the same as letting it go to sleep or simply closing the cover. (*Check one*)

- 1 Yes
- 2 No
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A11** Does anyone in your household work primarily from home? (*Check one*)

- 1 Yes
- 2 No
- 9 Refused

**A11b** [SKIP TO A12A IF A11<>1] Including yourself, how many people work from your home?  
(*Enter number of people below*)

- \_\_\_ # of people [1-20]
- 6 Programmed skip
- 9 Refused

**o\_A11bb** What type of business is this? (*Please describe below*)

[RECORD RESPONSE VERBATIM]

**A11c** Other than computers, printers, and copiers, what other types of energy-using equipment do you use for your business?

- 1 No other energy using equipment
- 2 Specify what types of equipment
- 6 Programmed skip
- 9 Refused

**o\_A11c** [ASK IF A11C=2] Description of other type of energy-using equipment.

[Note: A12ab Slashes changed to comma or 'or' on 12/2/2013]

**A12** How many of each of the following other types of entertainment or telecommunications equipment does your household use?

*(If none, please enter zero. Please scroll to see all equipment options.)*

For A12ab through A12l

|     |                                |        |
|-----|--------------------------------|--------|
| ___ | # of units                     | [0-20] |
| -4  | Interviewer / respondent error |        |
| -9  | Refused                        |        |

|                     |                                                                     |
|---------------------|---------------------------------------------------------------------|
| <b>A12ab</b>        | Combination cable, satellite, or set-top box with DVR unit          |
| <b>A12a</b>         | Cable, satellite, or set-top box (What is a set-top box?)           |
| <b>A12b</b>         | DVR (for example, TiVo)                                             |
| <b>A12c</b>         | DVD/Blu-Ray player or recorder                                      |
| <b>A12d</b>         | VCR                                                                 |
| <b>A12e</b>         | Digital converter box                                               |
| <b>A12f</b><br>Wii) | Video gaming system (for example, PS3, PlayStation, Nintendo, XBOX, |
| <b>A12g</b>         | Home theater system                                                 |
| <b>A12h</b>         | MP3 players (for example, iPod)                                     |
| <b>A12i</b>         | Cell phones/Smart phones                                            |
| <b>A12j</b>         | Cordless telephones                                                 |
| <b>A12k</b>         | Stereo system                                                       |
| <b>A12l</b>         | Digital photo album                                                 |

**A12n** Any other type of entertainment or telecommunications equipment?

- 1 Yes, Specify type below
- 2 No
- 2 Not asked in mini-survey

**o\_A12no** [SKIP IF A12n = 2] Description of other type entertainment or telecommunications equipment.

**A13** Do any of your [equipment] have the ENERGY STAR® logo? (*Check one*)

For A13a through A13i

- 1 Yes
- 2 No
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A13a** [ASK IF (E1 = 2 OR 3) AND (A12c OR A12d <> 0 AND -9) ] VCRs/DVD players

**A13b** [ASK IF (E1 = 2 OR 3) AND (A2b <> 0 AND -9) ] Plasma TV

**A13c** [ASK IF (E1 = 2 OR 3) AND (A2c <> 0 AND -9) ] LCD/LED TV

**A13d** [ASK IF (E1 = 2 OR 3) AND (A12k <> 0 AND -9) ] Stereo equipment

**A13e** [ASK IF (E1 = 2 OR 3) AND (A7a <> 0 AND -9) ] Desktop computer

**A13f** [ASK IF (E1 = 2 OR 3) AND (A7b <> 0 AND -9) ] Laptop computer

**A13g** [ASK IF (E1 = 2 OR 3) AND (A7e <> 0 AND -9) ] LED/LCD computer monitor

**A13h** [ASK IF (E1 = 2 OR 3) AND (A7g OR A7h OR A7i OR A7k <> 0 AND -9) ]  
Printer, scanner, OR all-in-one unit

**A13i** [ASK IF (E1 = 2 OR 3) AND (A12ab OR A12a <> 0 AND -9) ] Set-top/cable  
boxes

#### MISCELLANEOUS EQUIPMENT

**M2** Does anyone in your household have an electric automobile that you charge on your household electric meter? (*Check one*)

- 1 Yes
- 2 No
- 9 Refused

[Note: Changed from 'Do you have a home security system, including security cameras?' on 1/30/14

**A12m** Do you have a home security system? This may include a security camera. (*Check one*)

- 1 Yes
- 2 No
- 9 Refused

**M3** Do you use a generator, including natural gas, solar, or wind to supply your electric needs? (*Check one*)

- 1 Yes
- 2 No
- 9 Refused

**M4** Do you have a . . . ? (*Check one for each*)

For M4a through M4f

- 1 Yes
- 2 No
- 8 Don't know
- 9 Refused

**M4a** Well pump (What is a well pump?)

**M4b** Sump pump (What is a sump pump?)

**M4c** Waterbed heater

**M4d** Natural gas grill

**M4e** Natural gas fire pit

**M4f** Radiant floor heating separate from heating system (What is floor heating?)

**M5**

Does anyone in your household use any other major appliances or equipment in your home that use a lot of energy such as exercise equipment, welding equipment or heavy tools, or equipment used for a home business? (*Check one*)

- 1      Yes, please specify
- 2      No
- 2     Not asked in mini-survey
- 9     Refused

**\*M5a** [ASK IF M5=1] Description of other type other major appliances or equipment.

For M5ac1 through M5ac16

0 Not mentioned  
1 Mentioned  
-6 Programmed skip

**\*M5ac1** Air compressor  
**\*M5ac2** Elliptical  
**\*M5ac3** Exercise bike  
**\*M5ac4** Exercise equipment  
**\*M5ac5** Fish tank  
**\*M5ac6** Hair dryer  
**\*M5ac7** Heating pad/blanket  
**\*M5ac8** Musical equipment  
**\*M5ac9** Power tools  
**\*M5ac10** Sauna  
**\*M5ac11** Sewing machine  
**\*M5ac12** Stair climber  
**\*M5ac13** Treadmill  
**\*M5ac14** Water pump  
**\*M5ac15** Welder  
**\*M5ac16** Miscellaneous

**o\_M5a** [ASK IF M5ac16=1] Description of miscellaneous type of other major appliances or equipment.

**M6** Does your household use an energy management system? An energy management system provides real-time information on your energy usage and

allows you to control temperature settings, turn off lights, and appliances remotely.

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 9 Refused

#### UTILITY COMPANY

**U1** [ASK IF {(B1 <> 1, 3, AND 4) OR (B3 = 3 OR 4)} AND HAS NATURAL GAS (K2c2=1, K3c2=1, K4c2=1, H2=2, H7ag>=1, H8ac2=1, WH3=2, C8=2, P3b=2, OR P5=2) ]  
Does your household pay for natural gas directly to your gas company, or is natural gas included in your rent or condominium fee? (*Check one*)

- 1 Pay directly to natural gas company
- 2 Natural gas included in rent or condo fee
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 9 Refused

**U1a** [ASK IF U1<>2 AND HAS NATURAL GAS (K2c2=1, K3c2=1, K4c2=1, H2=2, H7ag>=1, H8ac2=1, WH3=2, C8=2, P3b=2, OR P5=2)]  
What company provides natural gas service to your home?  
(*Check one, scroll down to see all service providers*)

- 1 Agway Energy Services, LLC
- 2 Alpha Gas And Electric, LLC
- 3 Ambit New York, LLC
- 4 American Power & Gas LLC

- 5 Atlantic Energy LLC
- 6 Bath Electric, Gas & Water System
- 7 Bluerock Energy, Inc.
- 8 Central Hudson Gas & Electric Corporation
- 9 Chautauqua Utilities, Inc.
- 10 Citizens Choice Energy, LLC
- 11 Columbia Utilities, LLC
- 12 Consolidated Edison Company Of N Y, Inc.
- 13 Constellation Energy Gas Choice, Inc.
- 14 Corning Natural Gas Corporation
- 15 Crown Energy Services, Inc
- 16 Direct Energy Services, LLC
- 17 Empire State Pipeline
- 18 Energy Cooperative Of America, Inc.
- 19 Energy Discounters, LLC
- 20 Energy Plus Natural Gas LLC
- 21 Energymark, LLC
- 22 Family Energy Inc.
- 23 Filmore Gas Company, Inc.
- 24 Gateway Energy Services Corporation
- 25 Hiko Energy LLC
- 26 Hudson Energy Services, LLC
- 27 IDT Energy, Inc.
- 28 IGS Energy
- 29 Intelligent Energy
- 30 Just Energy
- 31 Keyspan Energy Delivery (Long Island)
- 32 Keyspan Energy Delivery (New York)
- 33 Major Energy Services

- 34 N.E.A. Cross Of New York, Inc.
- 35 National Fuel Gas Distribution Corporation
- 36 National Fuel Resources, Inc
- 37 National Grid
- 38 New Wave Energy Corp.
- 39 New York Gas & Electric
- 40 New York State Electric & Gas Corporation
- 41 Noco Natural Gas LLC
- 42 North American Power And Gas, LLC
- 43 Orange And Rockland Utilities, Inc.
- 44 Plymouth Rock
- 45 Pro Energy, Inc.
- 46 Reserve Gas Company, Inc.
- 47 Rochester Gas & Electric Corporation
- 48 St. Lawrence Gas Company, Inc.
- 49 Stand Energy Corporation
- 50 Utility Expense Reduction LLC
- 51 Valley Energy, Inc.
- 52 Village Of Hamburg Municipal Gas Utility
- 53 Village Of Sloan
- 54 Woodhull Municipal Gas Company
- 55 Your Energy Holdings, LLC
- 56 Other, specify
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**o\_U1a** [ASK IF U1a=56] Specify other gas utility.

**U2a** [ASK IF NO NATURAL GAS (K2c2<>1, K3c2<>1, K4c2<>1, H2<>2, (H7ag<1 OR -9), H8ac2<>1, WH3<>2, C8<>2, P3b<>2, AND P5<>2) ]  
Is natural gas service available on your street?

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**U2b** [ASK IF U2a = 1] Would you be interested in converting to natural gas?

- 1 Yes
- 2 No
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**U3**

[ASK IF (B3 = 3 OR 4) AND HAS FUEL OIL FOR HEATING OR WATER HEATING (H2=5, H8ac5=1 or WH3=5) ]

Does your household pay for fuel oil directly, or is it included in your rent or condominium fee?

- 1 Pay directly
- 2 Included in rent or condo fee
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**U5**

[ASK IF (B3 = 3 OR 4) AND HAS PROPANE FOR HEATING OR WATER HEATING (H2=3, H8ac3=1, or WH3=3) ]

Does your household pay for propane directly, or is it included in your rent or condominium fee?

- 1 Pay directly
- 2 Included in rent or condo fee
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

**U8**

In the past 5 years, has your household participated in any energy efficiency or energy saving programs offered by NYSERDA or your utility company to make your home or appliances more energy efficient? (*Check one*)

- 1 Yes
- 2 No
- 9 Refused

**U9** [ASK IF U8=1] What type of equipment did you install or recycle through a program?

*(Select all that apply)*

For U9c1 through U9c9

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 9 Refused

|             |                                       |
|-------------|---------------------------------------|
| <b>U9c1</b> | Insulation or weatherization measures |
| <b>U9c2</b> | Heating equipment                     |
| <b>U9c3</b> | Air conditioning equipment            |
| <b>U9c4</b> | Lighting                              |
| <b>U9c5</b> | Water heating equipment               |
| <b>U9c6</b> | Clothes washer                        |
| <b>U9c7</b> | Appliances                            |
| <b>U9c8</b> | Refrigerator or freezer recycling     |
| <b>U9c9</b> | Other, please specify                 |

**o\_U9** [ASK IF U9=9] Description of other type of equipment.

[Note: Categories 8 and 9 added on 1/20/2014]

**U10** [ASK IF U8=2] Why hasn't your household participated in any energy efficiency programs? *(Select all that apply)*

For U10c1 through U10c9

- 0 Not mentioned
- 1 Mentioned
- 4 Interviewer / respondent error
- 6 Programmed skip

-9      Refused

|              |                                                  |
|--------------|--------------------------------------------------|
| <b>U10c1</b> | Am not aware of any                              |
| <b>U10c2</b> | Do not need anything done                        |
| <b>U10c3</b> | Don't know who to contact to participate         |
| <b>U10c4</b> | Can't afford to install new equipment/appliances |
| <b>U10c5</b> | My energy bills are not that high                |
| <b>U10c6</b> | I rent                                           |
| <b>U10c7</b> | Other, specify                                   |
| <b>U10c8</b> | Too busy                                         |
| <b>U10c9</b> | Recently moved to home                           |

**o\_U10**      [ASK IF U10c7=1] Description of other reason why household hasn't participated.

**U12**      Are you considering replacing or purchasing any of the following in the next five  
**years?**

*(Select all that apply)*

For U12c1 through U12c7

|    |               |
|----|---------------|
| 0  | Not mentioned |
| 1  | Mentioned     |
| -9 | Refused       |

|              |                                       |
|--------------|---------------------------------------|
| <b>U12c1</b> | Insulation or weatherization measures |
| <b>U12c2</b> | Heating equipment                     |
| <b>U12c3</b> | Air conditioning equipment            |
| <b>U12c4</b> | Water heating equipment               |
| <b>U12c5</b> | Clothes washer                        |
| <b>U12c6</b> | Appliances                            |
| <b>U12c7</b> | None of the above                     |

**U13** If there was a program available to you that would help pay for part of the cost for purchasing new energy efficient equipment, which of the following would you consider replacing within the next five years? *(Select all that apply)*

For U13c1 through U13c7

0 Not mentioned

1 Mentioned

-9 Refused

**U13c1** Insulation or weatherization measures

**U13c2** Heating equipment

**U13c3** Air conditioning equipment

**U13c4** Water heating equipment

**U13c5** Clothes washer

**U13c6** Appliances

**U13c7** None of the above

**U14**

[SKIP IF REP<>99 (NOT SUPPLEMENTAL NEW CONSTRUCTION SAMPLE)]

Please provide your best estimate of the total electric costs your home paid in the last 12 months. Do not include natural gas or other fuels. *(Check one)*

- |    |                          |
|----|--------------------------|
| 1  | \$500 or less            |
| 2  | \$501 - \$1000           |
| 3  | \$1,001 - \$1,500        |
| 4  | \$1,501 - \$2,000        |
| 5  | \$2,001 - \$2,500        |
| 6  | \$2,501 - \$3,000        |
| 7  | \$3,001 - \$3,500        |
| 8  | \$3,501 - \$4,000        |
| 9  | \$4,000 or more          |
| -2 | Not asked in mini-survey |
| -6 | Programmed skip          |
| -8 | Don't know               |
| -9 | Refused                  |

### **\*U14\_Consumption**

[Consumption rate categories calculated by dividing dollar amounts in U14 by 0.183 \$/kWh.]

|    |                          |
|----|--------------------------|
| 1  | 2,737 kWh or less        |
| 2  | 2,737 kWh to 5,470 kWh   |
| 3  | 5,470 kWh to 8,202 kWh   |
| 4  | 8,202 kWh to 10,934 kWh  |
| 5  | 10,934 kWh to 13,667 kWh |
| 6  | 13,667 kWh to 16,399 kWh |
| 7  | 16,399 kWh to 19,131 kWh |
| 8  | 19,131 kWh to 21,858 kWh |
| 9  | 21,858 kWh or more       |
| -2 | Not asked in mini-survey |
| -6 | Programmed skip          |

## DEMOGRAPHICS

**D2** Some background information about the people living in your household will also help us understand how you use energy. All of your answers will be kept strictly confidential. Including yourself, how many people currently living in your home year-round are in the following age groups? Please exclude anyone who is just visiting, children who may be away at college or those deployed in the military. *(If none, please enter zero)*

For D2\_5 through D2\_65

\_\_\_ # of people [0-25]  
-2 Not asked in mini-survey  
-9 Refused

|              |                       |
|--------------|-----------------------|
| <b>D2_5</b>  | Less than 5 years old |
| <b>D2_6</b>  | 6-17 years old        |
| <b>D2_18</b> | 18-24 years old       |
| <b>D2_25</b> | 25-34 years old       |
| <b>D2_35</b> | 35-44 years old       |
| <b>D2_45</b> | 45-54 years old       |
| <b>D2_55</b> | 55-64 years old       |
| <b>D2_65</b> | 65 or older           |

**D3**

What is the highest level of education a person still living in your household has completed? (*Check one*)

- 1 Less than high school
- 2 Some high school
- 3 High school graduate or equivalent (e.g., GED)
- 4 Trade or technical school
- 5 Some college, no degree
- 6 College degree (e.g. Bachelor's degree)
- 7 Some graduate school
- 8 Graduate degree (e.g. Masters or Doctorate degree)
- 2 Not asked in mini-survey
- 9 Refused

**D4**

For classification purposes only, which of the following best describes your household's total income in 2012? (*Check one*)

- 1 Less than \$25,000
- 2 \$25,000–less than \$30,000
- 3 \$30,000–less than \$35,000
- 4 \$35,000–less than \$50,000
- 5 \$50,000–less than \$75,000
- 6 \$75,000–less than \$100,000
- 7 \$100,000–less than \$150,000
- 8 \$150,000–less than \$200,000
- 9 \$200,000 or more
- 2 Not asked in mini-survey
- 9 Prefer not to answer

**D5** What is your gender?

- 1 Male
- 2 Female
- 2 Not asked in mini-survey
- 9 Prefer not to answer

[Note: Wording asking for contact info changed on 1/6/2014]

**D6** [ASK IF APARTMENT WITH 5 OR MORE UNITS B3=4] As part of this study, we are also talking with property owners and managers to better understand the energy using equipment in common areas. Please provide contact information for the person or firm who has responsibility for your building and/or systems in the common areas (this may be a property owner or manager, landlord, or superintendent). Even if you do not have all pieces of information, please provide as much as you are able. (Enter information below)

**D6** Name of apartment complex: \_\_\_\_\_

**D6m** Property Owner or Manager's Name: \_\_\_\_\_

**D6t** Telephone number (###-###-####): \_\_\_\_\_

[Note: Time of visit changed from '3-4 hours' to 'two hours' on 12/11/2013.]

[Note: Sentence about fuel cut. Additional reminder about gift card added. Change 'reward card' to gift card. 12/12/2013]

**D7** [SKIP TO D9a IF NOT SINGLE FAMILY (IF B3a>4 AND B3a<=2000) OR B3b>1 OR (B3a=8888 AND B3b = -9) OR (B3=2 OR 4 AND B3a AND B3b = -9) ]  
NYSERDA is offering select households an additional \$100 gift card to allow a certified and trained technician to visit their home to gather more detailed information about the home's energy usage. The visit should take about two hours depending on the size, age, and complexity of your home and tests to be performed. By saying yes, you are simply agreeing to be re-contacted within the next couple weeks to hear more details about the visit and set up an appointment. The information gathered will only be reported in aggregate with data from other homes to evaluate and improve energy efficiency programs offered by NYSERDA and your utility. Would you be interested in being a part of this type of visit for an additional \$100 gift card? This would be for your home at [SERVICE ADDRESS]. *(Check one)*

- 1 Yes
- 2 Possibly, but I need more information
- 3 No
- 2 Not asked in mini-survey
- 4 Interviewer / respondent error
- 6 Programmed skip
- 9 Refused

Note: Updated from mailing address to service address and added a field for State on 12/2/2013.

**D8** [ASK IF D7=1 OR 2] Please provide your contact information so we can have someone call you to schedule an appointment. The information that is on file is: [SERVICE ADDRESS], [SERVICE CITY], [SERVICE STATE] [SERVICE ZIP].

**D8** First and Last name of person to ask for

**D8b** Address

**D8c** City

**D8h** State

**D8d** Zip Code

**D8e** Main number

**D8f** Secondary number

**D8g** Email

**D9a** To ensure your 20 dollar gift card arrives please confirm your mailing address. Is it? [MAILING ADDRESS]

- |    |                          |              |
|----|--------------------------|--------------|
| 1  | Yes                      | [SKIP TO D9] |
| 2  | No                       |              |
| -2 | Not asked in mini-survey |              |
| -9 | Refused                  |              |

**D9** Please enter your correct mailing address:

**D9aa** Name

**D9b** Street Address

**D9c** City

**D9d** State

**D9e** Zip code

**D9** Additional studies are planned in the near future to gain a better understanding of residential energy use and energy decision making. The goal of these studies is to improve the effectiveness of energy programs to serve New Yorkers. Would you be interested in participating in future energy-related studies? By saying yes, you are simply agreeing to be re-contacted to learn more about these studies.

- 1 Yes
- 2 Possibly, but I need more information
- 3 No
- 2 Not asked in mini-survey
- 9 Refused

**D10** Thank you for your help with this important study. Do you have any comments that you would like to share?

|         |                          |           |      |
|---------|--------------------------|-----------|------|
| 1       | Yes                      | [SPECIFY] |      |
| 2       | No comment               |           | [END |
| SURVEY] |                          |           |      |
| -2      | Not asked in mini-survey |           |      |
| -9      | Refused                  |           |      |

**o\_D10** [ASK IF D10=1] Comments from the respondent [END  
SURVEY]

**CLOSE** Thank you for your interest in the NYSERDA Residential Baseline Study. We have completed data collection in your area. For more information on this important study or information on energy efficiency programs in your area, please visit <http://www.nyserdera.ny.gov/energystudyinfo> or call toll-free 1-888-NY SMART.

|   |                                      |         |
|---|--------------------------------------|---------|
| 1 | Attempted survey after region closed | [END    |
|   |                                      | SURVEY] |

**TERM** [ASK IF S1=3] Thank you for your interest in the NYSERDA energy study. Because you no longer live at this address, we do not need further information on that home. Please proceed to the next page to find out about ways to save energy in your new home.

|   |            |         |
|---|------------|---------|
| 1 | Ineligible | [END    |
|   |            | SURVEY] |

# Appendix C: Multifamily Property Owner or Manager Survey Instrument

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## NYSERDA RESIDENTIAL BASELINE STUDY – MULTIFAMILY PROPERTY OWNER/MANAGER CODEBOOK

The survey modules included in this questionnaire are as follows:

- Introduction
- Property Characteristics
- ENERGY STAR Awareness
- Heating and Cooling
- Water Heating
- Tenant Appliances
- Lighting
- Purchasing Decisions
- Common Areas
- Clothes Washing and Drying
- Miscellaneous and Recruitment

NOTE:

- Variable names are in bold type.
- A code of (-3) means that the respondent's answer did not make sense with the metrics of the question.
- A code of (-4) means there was a system error because of interviewers going back to previous questions in the survey and changed a responses that affected subsequent question skips
- A code of (-5) means a respondent did not get asked that question because of a question being added or changed after fielding or a program skip error
- A code of (-6) means programmed skip (i.e., a skip that was purposely programmed based on skip patterns)
- A code of (-7) means not applicable.
- A code of (-8) means don't know.
- A code of (-9) means refused.
- Questions were asked of all respondents unless indicated otherwise.
- Response codes with an asterisk (\*) are recoded responses to open-ended questions, or responses added during data cleaning.

## Sample Variable List

|                          |                                                                                           |               |                            |
|--------------------------|-------------------------------------------------------------------------------------------|---------------|----------------------------|
| <b>[surveyID]</b>        | Unique case identifier for the multifamily study                                          |               |                            |
| <b>[COMPLEX_NAME]</b>    | Multifamily complex name                                                                  |               |                            |
| <b>[FNAME]</b>           | Multifamily contact person – First name                                                   |               |                            |
| <b>[LNAME]</b>           | Multifamily contact person – Last name                                                    |               |                            |
| <b>[PHONE]</b>           | Contact phone number                                                                      |               |                            |
| <b>[RENTCAID]</b>        | Unique case identifier of the single family where the multifamily data originated from    |               |                            |
| <b>[RENTADDR]</b>        | Service address of the single family case where multifamily data originated from          |               |                            |
| <b>[RENTCITY]</b>        | Service address city of the single family case where multifamily data originated from     |               |                            |
| <b>[RENTSTAT]</b>        | Service address state of the single family case where multifamily data originated from    |               |                            |
| <b>[RENTZIPC]</b>        | Service address zip code of the single family case where multifamily data originated from |               |                            |
| <b>[ELECTRICUTILITY]</b> | Electric utility of the single family case where multifamily data originated from         |               |                            |
| <b>[GASUTILITY]</b>      | Gas utility of the single family case where multifamily data originated from              |               |                            |
| <b>[COUNTY]</b><br>from  | County of the single family case where multifamily data originated from                   |               |                            |
| <b>[REGION]</b>          | New York region of the single family case where multifamily data originated from          |               |                            |
| <b>[SampledRegion]</b>   | Region with the chronological order of sampling                                           |               |                            |
| <b>[ClimateZone]</b>     | Climate zone (4, 5, or 6)                                                                 |               |                            |
| <b>[CONSTRUCTION]</b>    | Flag indicating construction type                                                         |               |                            |
|                          | 0                                                                                         | Existing      | [IF S17<>11, 12, OR 13]    |
|                          | 1                                                                                         | New           | [IF S17=11, 12, OR 13]     |
| <b>[RECRUITED]</b>       | Flag indicating if Respondent was recruited for onsite scheduling                         |               |                            |
|                          | 0                                                                                         | Not recruited | [IF M4a OR M4b <> 1 AND 2] |
|                          | 1                                                                                         | Recruited     | [IF M4a OR M4b = 1 OR 2]   |

## INTRODUCTION

**INTRO1** Hello, my name is [NAME] and I'm calling on behalf of New York State Energy Research and Development Authority, or NYSERDA. May I please speak with [USE CONTACT NAME IF AVAILABLE; ELSE: the person responsible for managing property improvements at [COMPLEX\_NAME OR RENTADDR].

1 Yes

2 No [ATTEMPT TO CONVERT]

[RENTER'S ADDRESS: [RENT ADDRESS]]

**INTRO2** I'm with Tetra Tech, an independent research firm. This is not a sales call; we are contacting property owners and managers on behalf of NYSERDA in order to learn more about energy using equipment in multifamily buildings. This information will help NYSERDA improve the types of energy efficiency programs that they offer to multifamily property owners and managers in New York.

Please be assured that the information you provide will be kept confidential to the extent permitted by law. NYSERDA's analysis will only use summary level data and will not identify individual respondents or firms.

Before we start, I would like to inform you that for quality control purposes, this call will be recorded and monitored.

[ONLY READ IF REQUESTED BY CUSTOMER: If you would like to talk with a representative from NYSERDA to verify this study, please call 1-877-NYSMART or email [info@nyserda.ny.gov](mailto:info@nyserda.ny.gov)]

[This call should take about 30 minutes.]

[PRESS 1 TO CONTINUE]

## PROPERTY CHARACTERISTICS

[Note: Question added on 11/14/2013]

**S0** [SKIP IF [COMPLEX\_NAME] IS EMPTY] Just to confirm, is the multifamily unit at [RENTADDR] in [RENTCITY] included in [COMPLEX\_NAME]?

- 1 Yes
- 2 No [TERMINATE, DO DIRECTORY ASSISTANCE TO FIND BETTER PHONE NUMBER]
- 5 Programming change
- 6 Programmed skip

**S1**

First I would like to get some background information about you and the multifamily property at [COMPLEX\_NAME]. What is your position or job title at that location or with the company that manages this property? [PROBE AS NEEDED]

- 1 Owner of property
- 2 Property/leasing manager/associate
- 3 Senior property manager
- 4 Maintenance supervisor / Facilities manager
- 5 Senior/regional maintenance supervisor
- 6 Purchasing manager
- 7 Other [SPECIFY]
- \*8 Managing agent
- \*9 District manager / Regional manager
- \*10 President / Vice president
- 8 Don't know
- 9 Refused

[RENTER'S ADDRESS: [RENT ADDRESS]]

**S1\_7\_oth** Description of other type of job title (see S1 above)

**S1a** How is the electric service metered from your utility for this building? Is it one master meter with no individual tenant unit meters, master metered for the total building plus electric sub-meters for individual tenant units, individually metered plus separate meters for common areas, or are all individual units metered with no master meter?

- 1 One master meter – no individual tenant unit meters  
[TERMINATE]
- 2 Master meter for the total building plus electric sub-meters for individual tenant units
- 3 Individually metered plus separate meters for common area
- 4 All individually metered tenant units, no master meter
- 5 Other [SPECIFY]
- 8 Don't know
- 9 Refused

**S1a\_5\_oth** Description of other type of electric meter set-up (see S1a above)

**S2** How many years has your organization been in the business of owning, managing, or maintaining multifamily properties?

- \_\_\_ # of years [0-750]
- 8 Don't know
- 9 Refused

[Note: Question added on 01/30/2014 to accommodate landlord info from NYSEG/RG&E]

**S3a** Which of the following best describes the building at [RENTADDR]? Is it a building with one to four units or a building with five or more units?

- 1 1-4 units [TERMINATE, SKIP TO NOTQAL]
- 2 5 or more units
- 5 Programming change

**S3** About how many separate multifamily buildings are located at your multifamily property at [COMPLEX\_NAME OR RENTADDR]?

— # of buildings [1-75] [APPROXIMATION IF UNABLE TO GIVE EXACT NUMBER]

[RENTER'S ADDRESS: [RENT ADDRESS]]

**S4** Does your organization own or manage any OTHER properties in New York State?

- 1 Yes
- 2 No [SKIP TO S7]
- 8 Don't know [SKIP TO S7]
- 9 Refused [SKIP TO S7]

**S5** How many other properties does your organization own/manage in New York State?

\_\_\_\_\_ # of other properties [1-750]

-6 Programmed skip

-8 Don't know

-9 Refused

**S6** Were any of these other properties built since January 2012?

1 Yes

2 No

-6 Programmed skip

-8 Don't know

-9 Refused

**S7** Now focusing on the multifamily property at [COMPLEX\_NAME OR RENTADDR],  
[IF S3=1: Does this building / IF S3>1: Do any of these buildings] contain any shops, restaurants retail space, or space used by any other business?

- |    |            |               |
|----|------------|---------------|
| 1  | Yes        |               |
| 2  | No         | [SKIP TO S10] |
| -8 | Don't know | [SKIP TO S10] |
| -9 | Refused    | [SKIP TO S10] |

**S8** What types of business? [SELECT ALL THAT APPLY]

For S8\_1 through S8\_6

- |    |                 |
|----|-----------------|
| 0  | Not mentioned   |
| 1  | Mentioned       |
| -6 | Programmed skip |
| -8 | Don't know      |
| -9 | Refused         |

**S8\_1** Office/professional

**S8\_2** Food sales or service

**S8\_3** Retail

**S8\_4** Education

**S8\_5** Health care

**S8\_6** Other [SPECIFY]

**S8\_6\_oth** Description of other type of business (see S8 above)

**S9** Approximately what percentage of the total floor space at this property is allocated to non-residential business space?

\_\_\_ Percentage [1-100%]

-6 Programmed skip

-8 Don't know

-9 Refused

**S10** About how many living units are located in [IF S3=1: the multifamily building] [IF S3>1: all of the multifamily buildings] at [COMPLEX\_NAME OR RENTADDR]?  
[Probe for all units at the property and not just one building]

\_\_\_\_\_ # living units [1-7500]

-8 Don't know

-9 Refused

[RENTER'S ADDRESS: [RENT ADDRESS]]

**S11** [ASK IF S10=-8] Do you think the total number of housing units at your property is 100 or more, 99 to 76, 75 to 50, 49 to 5, or less than 5?

- 1 100 or more
- 2 99 to 76
- 3 75 to 50
- 4 49 to 5
- 5 Less than 5
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**S12** What percentage of the units at your property are occupied?

- \_\_\_ % of occupied [0-100%]
- 8 Don't know
- 9 Refused

**S13** Not counting the basement, how many stories [IF S3=1: does this multifamily building have/IF S3>1: on average, do these multifamily buildings have]?

- \_\_\_ # of stories [1-75] [YOUR BEST ESTIMATE IS FINE]
- 8 Don't know
- 9 Refused

**S14** Are there other enclosed buildings at this multifamily property that are used for common area purposes, such as a utility shed, pool house, or a community center?

- |    |            |               |
|----|------------|---------------|
| 1  | Yes        |               |
| 2  | No         | [SKIP TO S17] |
| -8 | Don't know | [SKIP TO S17] |
| -9 | Refused    | [SKIP TO S17] |

**S15** How many other buildings?

- |    |                      |        |
|----|----------------------|--------|
| —  | # of other buildings | [1-75] |
| -6 | Programmed skip      |        |
| -8 | Don't know           |        |
| -9 | Refused              |        |

**S16** What [IF S15=1: is this building; IF S15>1: are these buildings] used for?  
[SELECT ALL THAT APPLY]

For S16\_1 through S16\_10

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**S16\_1** Gym or exercise room  
**S16\_2** Club house  
**S16\_3** Rental office  
**S16\_4** Laundry  
**S16\_5** Maintenance equipment shed  
**S16\_6** Storage units  
**S16\_7** Community center  
**S16\_8** Boiler room  
**S16\_9** Garage  
**S16\_10** Other [SPECIFY]  
**S16\_10\_oth** Description of other building use (see S16 above)

[Note: Option 13 added on 01/02/2014]

**S17** In approximately what year was this multifamily property built?  
[PROBE WITH CATEGORIES AS NEEDED]

- 1 1939 or earlier
- 2 1940 to 1949
- 3 1950 to 1959
- 4 1960 to 1969

- 5 1970 to 1979
- 6 1980 to 1989
- 7 1990 to 1999
- 8 2000 to 2009
- 9 2010
- 10 2011
- 11 2012
- 12 2013
- 13 2014
- 8 Don't know
- 9 Refused

**S18**

Has this property undergone any major renovations, remodels, or additions in the PAST five years? This could include activities such as adding more multifamily buildings or units, adding additional common area space, installing new systems, or reconstruction due to flooding or hurricane.

- 1 Yes
- 2 No [SKIP TO S18b]
- 8 Don't know [SKIP TO S18b]
- 9 Refused [SKIP TO S18b]

**S18a** What types of major renovations, remodels, or additions did you make in the PAST five years? Was it... [SELECT ALL THAT APPLY] [READ CATEGORIES]

For S18a\_1 through S18a\_10

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**S18a\_1** Increasing the number of units  
**S18a\_2** Additions to common area space  
**S18a\_3** Major renovations to the building  
**S18a\_4** Any reconstruction due to flooding or hurricane damage  
**S18a\_5** Adding new systems such as central AC, heating, water heating  
**S18a\_6** Anything else [SPECIFY]  
**\*S18a\_9** Lighting upgrades  
**\*S18a\_10** Cosmetic upgrades (painting, carpets, landscaping)

**S18a\_6\_oth** Description of other type of renovation, remodels, or additions. (see S18a above)

**S18b** Do you plan to complete any major renovation projects or additions in the NEXT five years?

- 1 Yes [SPECIFY]
- 2 No
- 8 Don't know
- 9 Refused

**S18b\_1\_oth** What type of major renovation projects or additions do you plan to do in the next five years? (see S18b above)

**\*S18ba** What type of major renovation projects or additions do you plan to do in the next five years? [CATEGORIZED] (see S18b above)

For S18ba\_1 through S18ba\_10

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip

- \*S18ba\_1** Increasing the number of units
- \*S18ba\_2** Additions to common area space
- \*S18ba\_3** Major renovations to the building
- \*S18ba\_4** Any reconstruction due to flooding or hurricane damage
- \*S18ba\_5** Adding new systems such as central AC, heating, water heating
- \*S18ba\_6** Other [SPECIFY]
- \*S18ba\_9** Lighting upgrades
- \*S18ba\_10** Cosmetic upgrades (painting, carpets, landscaping)

**S18ba\_6\_oth** Description of other type of major renovation project or addition planned in the next five years? (see S18ba above)

**S19** [IF S10<>-8 OR -9: Of the [INSERT S10 RESPONSE] units] [IF S10=-8 OR -9:  
Of all the living units at [COMPLEX\_NAME OR RENTADDR] , approximately  
what percentage of these are studios, one bedroom units, two bedroom units,  
and three or more bedroom units?

[THESE CATEGORIES NEED TO ADD UP TO 100 PERCENT]

For S19a through S19d

\_\_\_\_ [0-100%]

-8 Don't know

-9 Refused

**S19a** % of studios

**S19b** % of 1 bedroom units

**S19c** % of 2 bedroom units

**S19d** % of 3 or more bedroom units

**S19\_sum** [ASK IF S19a THROUGH S19d DO NOT SUM TO 100% AND NONE = -8 OR -9]  
The quantities that you have given me do not add up to 100%. Can you please  
tell me which to correct?

[PRESS 1 TO BACK UP AND CORRECT]

**S23** Does your property have natural gas service?

1 Yes

2 No [SKIP TO E1]

-8 Don't know [SKIP TO E1]

-9 Refused [SKIP TO E1]

**S24** How is the NATURAL GAS service metered from your utility for this building? Is it one master meter with no individual tenant unit meters, individual metered plus separate meters for common areas, or are all individual units metered with no master meter?

- 1 One master meter – no individual tenant unit meters
- 2 Individually metered plus separate meters for common area
- 3 All individually metered tenant units, no master meter
- 4 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**S24\_4\_oth** Description of other type of gas meter set-up (see S24 above)

## ENERGY STAR AWARENESS

**E1** Before I ask about the energy using equipment at your property, I'd like to ask about your familiarity with the ENERGY STAR logo. The ENERGY STAR logo is usually a blue and white sticker on an appliance that says "ENERGY STAR" on it.

Equipment having the ENERGY STAR logo meets strict energy efficiency guidelines set by the U.S. Environmental Protection Agency and the U.S. Department of Energy. Before now, were you not at all familiar, somewhat familiar, or very familiar with ENERGY STAR?

- 1 Not at all familiar
- 2 Somewhat familiar
- 3 Very familiar
- 8 Don't know
- 9 Refused

**E2** Buildings can also be rated for efficiency. [IF S15=1: Is this building/IF S15>1: Are these buildings] classified as being ENERGY STAR qualified, LEED certified, or a Zero Net Energy building? [SELECT ALL THAT APPLY]

For E2\_1 through E2\_4

- 0 Not mentioned
- 1 Mentioned
- 8 Don't know
- 9 Refused

**E2\_1** ENERGY STAR qualified

**E2\_2** LEED certified

**E2\_3** Zero net energy

**E2\_4** None

## HEATING AND COOLING

**H1** Does this property have a central system that provides HEATING to multiple living units or does each unit have its own heating system?

- 1 Central heating system
- 2 Each unit has its own heating system

**H2** What is the primary type of fuel used by [IF H1=1, show “the central heating system” or IF H1=2, show “the heating system in each unit”] at this multifamily property?  
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 District Steam
- 5 Fuel oil
- 6 Kerosene
- 7 Wood/wood pellets
- 8 Solar
- 9 Geothermal
- 10 Other
- 8 Don't know
- 9 Refused

**H2a\_opn** [ASK IF H2=10] Specify what other type of fuel is used for heating (see H2 above)

**H3**

What type of primary heating system is used [IF H1=1, show “for the central heating system” or IF H1=2, show “for the heating system in each unit”] at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Forced air furnace with ducts to individual rooms
- 2 Central boiler with radiators or pipes in each room [Steam / H2O]
- 3 District steam with radiators or pipes in each room
- 4 Air source Heat pump
- 5 Ground source Heat pump
- 6 Baseboard heat
- 7 Heating stove burning wood or coal
- 8 Fireplace
- 9 Portable electric heater
- 10 Portable kerosene heater
- 11 Solar panels
- 12 Other [SPECIFY]
- 8 Don't know
- 9 Refused

**H3a\_opn**  
above.

[ASK IF H3=12] Specify what other type of heating system is used. See H3

**H3b**

[ASK IF H3=2] Is the central boiler steam or hot water?

- 1 Steam
- 2 Hot water
- 4 Interviewer mistake
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**H4**

About how old is [IF H1=1, show "the central heating system" or IF H1=2, show "are the majority of the heating systems in each unit"]?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 8 Don't know
- 9 Refused

**H5** [ASK IF E1=2 OR 3 AND H4=1, 2, OR 3] [IF H1=1, show “Is the central heating system” or IF H1=2, show “Is the heating system in each unit”] ENERGY STAR rated?

[PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don’t know
- 9 Refused

**H6** Do you usually have a tune up done [IF H1=1, show “on the central heating system” or IF H1=2, show “on the heating system in each unit”] each year by a heating contractor or by yourself?

- 1 Yes, done by a heating contractor
- 2 Yes, do it myself
- 3 No
- 8 Don’t know
- 9 Refused

**H7** Does your property have a central system that provides COOLING to multiple living units, or do you provide each unit its own air conditioning system, or do you not provide any air conditioning?

- 1 Central cooling system
- 2 Individual in-unit cooling systems
- 3 No air conditioning provided [SKIP TO WH1]
- 8 Don’t know
- 9 Refused

**H8** About how old are the majority of [IF H7=1, SHOW “the central cooling systems” OR IF H7=2, SHOW “the cooling systems in each unit”] at this multifamily property?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don’t know
- 9 Refused

**H9** [ASK IF E1=2 OR 3 AND H8=1, 2, OR 3] Is/are the majority of [IF H7=1, show “the central cooling system[s]” or IF H7=2, show “the cooling system in each unit[s]”] ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don’t know
- 9 Refused

**H10**

Do you usually have a tune up done on the air conditioning system[s] each year?

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

## WATER HEATING

**WH1** Does your property have a central system that provides domestic HOT WATER to multiple living units?

- 1 Yes
- 2 No [SKIP TO A1]
- 8 Don't know
- 9 Refused

**WH2** What type of system is the primary water heating system used at this property? Is it a stand-alone storage tank, a tankless or on demand water heater, a heat pump water heater, part of your heating system boiler, or something else?

- 1 Stand-alone storage tank
- 2 Tankless or on demand water heater
- 3 Heat pump water heater
- 4 Part of heating system boiler
- 5 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**WH2a\_opn** [ASK IF WH2=5] Specify what other type of water heating system used (see WH2a above)

**WH3**

What is the primary type of fuel used for WATER HEATING at your property?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 District Steam
- 5 Fuel Oil
- 6 Kerosene
- 7 Solar
- 8 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**WH3a\_opn**

[ASK IF WH3=8] Specify what other fuel used for water heating fuel used (see WH3 above)

**WH4**

About how old is your primary water heating system?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**WH5**

[ASK IF E1=2 OR 3 AND WH4=1, 2, OR 3] Is this water heating system ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

## TENANT APPLIANCES

A1 Which of the following appliances do you supply to your tenants in their living units at this multifamily property? [READ LIST; SELECT ALL THAT APPLY]

For A1\_1 through A1\_9

0 Not mentioned

1 Mentioned

-8 Don't know [SKIP TO A4]

-9 Refused [SKIP TO A4]

A1\_1 Refrigerator

A1\_2 Stove

A1\_3 Dishwasher

A1\_4 Microwave

A1\_5 Portable space heater

A1\_6 In-unit clothes washer

A1\_7 In-unit clothes dryer

A1\_8 In-unit water heater

A1\_9 None [SKIP TO A4]

**A2\_1**

[ASK IF A1\_1=1] On average, about how old are the majority of the refrigerators at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_1**

[ASK IF A1\_1=1 AND E1=2 OR 3 AND A2\_1=1, 2, OR 3] Are the majority of the refrigerators ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A2\_2**

[ASK IF A1\_2=1] On average, about how old are the majority of the stoves at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_2**

[ASK IF A1\_2=1 AND E1=2 OR 3 AND A2\_2=1, 2, OR 3] Are the majority of the stoves ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A2\_3**

[ASK IF A1\_3=1] On average, about how old are the majority of the dishwashers at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_3**

[ASK IF A1\_3=1 AND E1=2 OR 3 AND A2\_3=1, 2, OR 3] Are the majority of the dishwashers ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A2\_4**

[ASK IF A1\_4=1] On average, about how old are the majority of the microwaves at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_4**

[ASK IF A1\_4=1 AND E1=2 OR 3 AND A2\_4=1, 2, OR 3] Are the majority of the microwaves ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A2\_5**

[ASK IF A1\_5=1] On average, about how old are the majority of the portable space heaters at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_5**

[ASK IF A1\_5=1 AND E1=2 OR 3 AND A2\_5=1, 2, OR 3] Are the majority of the portable space heaters ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A2\_6**

[ASK IF A1\_6=1] On average, about how old are the majority of the in-unit clothes washers at this multifamily property?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_6**

[ASK IF A1\_6=1 AND E1=2 OR 3 AND A2\_6=1, 2, OR 3] Are the majority of the in-unit clothes washers ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A2\_7**

[ASK IF A1\_7=1] On average, about how old are the majority of the in-unit clothes dryers at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_7**

[ASK IF A1\_7=1 AND E1=2 OR 3 AND A2\_7=1, 2, OR 3] Are the majority of the in-unit clothes dryers ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A2\_8**

[ASK IF A1\_8=1] On average, about how old are the majority of the in-unit water heaters at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A3\_8**

[ASK IF A1\_8=1 AND E1=2 OR 3 AND A2\_8=1, 2, OR 3] Are the majority of the in-unit water heaters ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**A4** What is the primary type of fuel used for COOKING at your property?  
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Other [SPECIFY]
- 8 Don't know
- 9 Refused

**A4\_4\_opn** Description of other type of primary fuel used for cooking (see A4 above)

#### LIGHTING

**L1** Do you have any of the following natural lighting at this property in INDOOR common areas during the day? [READ LIST; SELECT ALL THAT APPLY]

For L1\_1 through L1\_4

- 0 Not mentioned
- 1 Mentioned
- 8 Don't know [SKIP TO A4]
- 9 Refused [SKIP TO A4]

**L1\_1** Skylights

**L1\_2** Tubular skylights that let daylight in through the roof

**L1\_3** Large uncovered window areas

**L1\_4** None

**L2** Which of the following types of LIGHTING CONTROLS do you use in INDOOR COMMON AREAS of your property? Do you use . . . [READ LIST; SELECT ALL THAT APPLY]

For L2\_1 through L2\_4

0 Not mentioned

1 Mentioned

-8 Don't know [SKIP TO A4]

-9 Refused [SKIP TO A4]

**L2\_1** Dimmer switches

**L2\_2** Occupancy/motion sensors

**L2\_3** Timers

**L2\_4** None

**L3** I'm going to read a list of different types of lighting. For each type please indicate approximately what percentage of the TOTAL general INDOOR common space is lit by that type of lighting? All of the categories should add up to 100 percent.

For L3a through L3i

\_\_\_\_ [0-100%]

-8 Don't know

-9 Refused

**L3a** Incandescent light bulbs

**L3b** T12s

**L3c** T8s

**L3d** T5s

**L3e** Compact fluorescent light or CFL bulbs

**L3f** Halogen bulbs

**L3g** High intensity discharge lamps such as high pressure sodium, metal halide or mercury vapor

**L3h** LED bulbs

**L3i** Something else [SPECIFY]

**L3i\_a\_opn** [ASK IF L3i<>0] Specify what other lighting is used in indoor common spaces. (see L3 above)

**L3\_sum** [ASK IF L3a THROUGH L3i DO NOT SUM TO 100% AND NONE = -8 OR -9]  
The quantities that you have given me do not add up to 100%. Can you please tell me which to correct? [PRESS 1 TO BACK UP AND CORRECT]

**L4** Using the same list, please indicate approximately what percentage of the TOTAL general OUTDOOR common space, such as walkways, parking lots, and parking garages is lit by the following lighting types? Once again, all of the categories should add up to 100 percent.

For L4a through L4i

\_\_\_\_ [0-100%]  
 -3 No outdoor lighting at property [SKIP TO DP1]  
 -4 Interviewer mistake  
 -8 Don't know  
 -9 Refused

**L4a** Incandescent light bulbs  
**L4b** T12s  
**L4c** T8s  
**L4d** T5s  
**L4e** Compact fluorescent light or CFL bulbs  
**L4f** Halogen bulbs  
**L4g** High intensity discharge lamps such as high pressure sodium, metal halide or mercury vapor  
**L4h** LED bulbs  
**L4i** Something else [SPECIFY]

**L4i\_a\_opn** [ASK IF L4i<>0, -8, or -9] Specify what other lighting is used in indoor common spaces. (see L4 above)

**L4\_sum** [ASK IF L4a THROUGH L4i DO NOT SUM TO 100% AND NONE = -8 OR -9]  
 The quantities that you have given me do not add up to 100%. Can you please tell me which to correct? [PRESS 1 TO BACK UP AND CORRECT]

Note: New option L5\_8 added on 04Mar2014.

**L5** Do you use OUTDOOR lighting at this location for parking, sidewalks, security lights, decorative lighting, outdoor signage, or something else? [SELECT ALL THAT APPLY]

For L5\_1 through L5\_5

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know
- 9 Refused

|             |                      |
|-------------|----------------------|
| <b>L5_1</b> | Parking              |
| <b>L5_2</b> | Security lights      |
| <b>L5_3</b> | Decorative lighting  |
| <b>L5_4</b> | Outdoor signage      |
| <b>L5_5</b> | Other [SPECIFY]      |
| <b>L5_8</b> | Sidewalks / Walkways |

**L5\_5\_oth** Description of other outdoor lighting use (see L5 above)

## PURCHASING DECISIONS

**DP1** Who is involved in making the decision whether to install energy efficient equipment in common areas and in-unit at your property?

[DO NOT READ; SELECT ALL THAT APPLY]

For DP1\_1 through DP1\_8

- 0 Not mentioned
- 1 Mentioned
- 8 Don't know
- 9 Refused

- DP1\_1** Owner
- DP1\_2** Property/leasing manager/associate
- DP1\_3** Senior property manager
- DP1\_4** Maintenance supervisor
- DP1\_5** Purchasing manager
- DP1\_6** Condo or co-op board
- DP1\_7** Tenants
- DP1\_8** Other [SPECIFY]
- \*DP1\_12** Managing agent
- \*DP1\_13** Corporate
- \*DP1\_14** President / Vice President
- \*DP1\_15** District manager / Regional manager

**DP1\_8\_oth** Description of other decision maker (see DP1 above)

**DP2**

In what year was the last time that you made any energy efficiency improvements to this property?

\_\_\_\_\_ Year [1900-2013]

-7 Never

-8 Don't know

-9 Refused

**DP3** What energy efficiency improvements were made to COMMON AREAS at this property?  
[DO NOT READ; RECORD ALL THAT APPLY]

For DP3\_1 through DP3\_9

- 0 Not mentioned
- 1 Mentioned
- 8 Don't know
- 9 Refused

|                |                         |
|----------------|-------------------------|
| <b>DP3_1</b>   | None                    |
| <b>DP3_2</b>   | Heating equipment       |
| <b>DP3_3</b>   | Cooling equipment       |
| <b>DP3_4</b>   | Water heating equipment |
| <b>DP3_5</b>   | Insulation              |
| <b>DP3_6</b>   | Lighting                |
| <b>DP3_7</b>   | Appliances              |
| <b>DP3_8</b>   | Windows                 |
| <b>DP3_9</b>   | Other [SPECIFY]         |
| <b>*DP3_12</b> | Doors                   |
| <b>*DP3_13</b> | Water saving devices    |

**DP3\_9\_oth** Description of other energy efficiency improvements made to common areas  
(see DP3 above)

**DP4** What energy efficiency improvements were made to INDIVIDUAL UNITS at this property? [DO NOT READ; RECORD ALL THAT APPLY]

For DP4\_1 through DP4\_9

- 0 Not mentioned
- 1 Mentioned
- 8 Don't know
- 9 Refused

|              |                         |
|--------------|-------------------------|
| <b>DP4_1</b> | None                    |
| <b>DP4_2</b> | Heating equipment       |
| <b>DP4_3</b> | Cooling equipment       |
| <b>DP4_4</b> | Water heating equipment |
| <b>DP4_5</b> | Insulation              |
| <b>DP4_6</b> | Lighting                |
| <b>DP4_7</b> | Appliances              |

|                |                      |
|----------------|----------------------|
| <b>DP4_8</b>   | Windows              |
| <b>DP4_9</b>   | Other [SPECIFY]      |
| <b>*DP4_12</b> | Doors                |
| <b>*DP4_13</b> | Water saving devices |

**DP4\_9\_oth** Description of other energy efficiency improvements made to individual units (see DP4 above)

**DP5** What types of energy saving upgrades do you think are needed at this facility?  
[DO NOT READ LIST; RECORD ALL THAT APPLY]

For DP5\_1 through DP5\_9

|    |               |
|----|---------------|
| 0  | Not mentioned |
| 1  | Mentioned     |
| -8 | Don't know    |
| -9 | Refused       |

|                |                         |
|----------------|-------------------------|
| <b>DP5_1</b>   | None                    |
| <b>DP5_2</b>   | Heating equipment       |
| <b>DP5_3</b>   | Cooling equipment       |
| <b>DP5_4</b>   | Water heating equipment |
| <b>DP5_5</b>   | Insulation              |
| <b>DP5_6</b>   | Lighting                |
| <b>DP5_7</b>   | Appliances              |
| <b>DP5_8</b>   | Windows                 |
| <b>DP5_9</b>   | Other [SPECIFY]         |
| <b>*DP5_12</b> | Doors                   |
| <b>*DP5_13</b> | Water saving devices    |

**DP5\_9\_oth** Description of other type of energy saving upgrades needed (see DP5 above)

**DP6** [SKIP IF DP5 = 1, -8, OR -9] Why have these energy efficiency improvements not been made at this facility? [DO NOT READ LIST; RECORD ALL THAT APPLY]

For DP6\_1 through DP6\_7

|   |               |
|---|---------------|
| 0 | Not mentioned |
| 1 | Mentioned     |

- 6 Programmed skip
- 8 Don't know
- 9 Refused

- DP6\_1** Not compatible with existing equipment
- DP6\_2** Initial purchase cost
- DP6\_3** Tenant pays utility bill
- DP6\_4** Length of payback period
- DP6\_5** No rebate offered
- DP6\_6** Too intrusive
- DP6\_7** Other [SPECIFY]
- \*DP6\_10** Not really needed
- \*DP6\_11** No approval from upper management
- \*DP6\_12** Haven't gotten to it
- \*DP6\_13** In the process
- \*DP6\_14** Recently took ownership

**DP6\_7\_oth** Description of other reason why energy efficiency improvements have not been made (see DP6 above)

**DP7** Property owners and managers often consider many different factors when deciding which type of energy-using equipment to purchase for their properties. On a scale of 1 to 5, with 1 being "not at all important," and 5 being "very important," how important are each of the following in your firm's decision of which equipment to purchase?

[SPECIFY FOR EACH ITEM]

For DP7a through DP7l

- Record importance [1-5]
- 8 Don't know
- 9 Refused

|             |                                                                          |
|-------------|--------------------------------------------------------------------------|
| <b>DP7a</b> | Compatibility with existing equipment/ property systems                  |
| <b>DP7b</b> | Initial purchase cost                                                    |
| <b>DP7c</b> | Operating cost                                                           |
| <b>DP7d</b> | Length of payback period                                                 |
| <b>DP7e</b> | Recommendation of contractor or supplier                                 |
| <b>DP7f</b> | Efficiency level of equipment                                            |
| <b>DP7g</b> | Rebate from utility or other source                                      |
| <b>DP7h</b> | Recommendations of others that had experience with equipment             |
| <b>DP7i</b> | Tenant dissatisfaction with current conditions                           |
| <b>DP7j</b> | Ability to charge a higher rent for a more comfortable property          |
| <b>DP7k</b> | Societal pressure to purchase equipment that is environmentally friendly |
| <b>DP7l</b> | Resiliency, or quality and durability of the equipment                   |

**DP8** Are you aware of energy efficiency programs offered to multifamily properties by NYSERDA or your utility?

- |    |                   |                |
|----|-------------------|----------------|
| 1  | Yes [Which ones?] |                |
| 2  | No                | [SKIP TO DP11] |
| -8 | Don't know        | [SKIP TO DP11] |
| -9 | Refused           | [SKIP TO DP11] |

**DP8\_1\_oth** Which energy efficiency programs are you aware of? (See DP8 above)

**\*DP8\_1a** Which energy efficiency programs are you aware of? [CATEGORIZED]  
(see DP8\_1\_oth above)

For DP8\_1a\_1\_1 through DP8\_1a\_13

- |   |               |
|---|---------------|
| 0 | Not mentioned |
| 1 | Mentioned     |

- 6 Programmed skip
- 8 Don't know

- \*DP8\_1a\_1 HVAC
- \*DP8\_1a\_2 Appliances
- \*DP8\_1a\_3 Energy Audit
- \*DP8\_1a\_4 Windows/Doors/Weatherization
- \*DP8\_1a\_5 Lighting
- \*DP8\_1a\_6 Water heating equipment
- \*DP8\_1a\_7 Convert to natural gas
- \*DP8\_1a\_8 Multifamily Performance program
- \*DP8\_1a\_9 ENERGY STAR homes
- \*DP8\_1a\_10 Water saving devices
- \*DP8\_1a\_11 Thermostats
- \*DP8\_1a\_12 Other [SPECIFY]
- \*DP8\_1a\_13 Can't name any
- \*DP8\_1a\_12\_oth Description of other energy efficiency programs they were aware of (see DP8\_1a above)

[Note: Added categories 14 and 15 on 1/30/14.]

**DP9** How do you prefer to hear about these types of energy efficiency programs?

[DO NOT READ; SELECT ALL THAT APPLY]

For DP9\_1 through DP9\_11

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know
- 9 Refused

|               |                                                            |
|---------------|------------------------------------------------------------|
| <b>DP9_1</b>  | Someone come to me and explained the program [PROBE: Who?] |
| <b>DP9_2</b>  | Through the Apartment association                          |
| <b>DP9_3</b>  | My utility Account Manager                                 |
| <b>DP9_4</b>  | Property owner                                             |
| <b>DP9_5</b>  | Utility bill insert                                        |
| <b>DP9_6</b>  | Website [Which ones?]                                      |
| <b>DP9_7</b>  | Direct mailing from utility                                |
| <b>DP9_8</b>  | Independent contractor                                     |
| <b>DP9_9</b>  | Subway ad                                                  |
| <b>DP9_10</b> | Billboard ad                                               |
| <b>DP9_11</b> | Other [SPECIFY]                                            |
| <b>DP9_14</b> | Email                                                      |
| <b>DP9_15</b> | Phone                                                      |

**DP9\_1\_oth** Who came and explained these types of energy efficiency programs?  
(see DP9 above)

**DP9\_6\_oth** Which websites did you hear about these types of energy efficiency programs?  
(see DP9 above)

**DP9\_11\_oth** Description of other way you prefer to hear about these types of energy efficiency programs (see DP9 above)

**DP10** In the past five years, have you participated in any energy efficiency or energy saving programs offered by NYSERDA or your utility company?

- 1 Yes [Which ones?]
- 2 No [Why not?]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**DP10\_1\_oth** Which energy efficiency/saving programs did you participate in? (See DP10 above)

**\*DP10\_1a** Which energy efficiency/saving programs did you participate in?  
[CATEGORIZED]

For DP10\_1a\_1 through DP10\_1a\_13

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know

- \*DP10\_1a\_1** HVAC
- \*DP10\_1a\_2** Appliances
- \*DP10\_1a\_3** Energy Audit
- \*DP10\_1a\_4** Windows/Doors/Weatherization
- \*DP10\_1a\_5** Lighting
- \*DP10\_1a\_6** Water heating equipment
- \*DP10\_1a\_7** Converting to natural gas
- \*DP10\_1a\_8** Multifamily Performance program
- \*DP10\_1a\_9** ENERGY STAR homes

\*DP10\_1a\_12      Other [SPECIFY]

**DP12\_opn** Which websites or publications do you typically go to for energy-related information?

[RECORD RESPONSE VERBATIM]

**\*DP12\_1a** Which websites or publications do you typically go to for energy-related information? [CATEGORIZED] (see DP12\_opn above)

For DP12\_1a\_1 through DP12\_1a\_11

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know

**\*DP12\_1a\_1** General web search

**\*DP12\_1a\_2** Utilities (NYSERDA, ConEd, LIPA, National Grid, Central Hudson, PSE&G)

**\*DP12\_1a\_3** LEED

**\*DP12\_1a\_4** Tradeshow

**\*DP12\_1a\_5** Consultants/Contractors

**\*DP12\_1a\_6** Word of mouth

**\*DP12\_1a\_7** Suppliers

**\*DP12\_1a\_8** National Fuel

**\*DP12\_1a\_9** New York State

**\*DP12\_1a\_10** New York City

**\*DP12\_1a\_11** Other [SPECIFY]

**\*DP12\_1a\_11\_oth** Description of other websites or publications typically used for energy-related information? (see DP12\_1a above)

**DP12a\_opn** What sources do you use for real estate management and industry information?

[RECORD RESPONSE VERBATIM]

**\*DP12a\_1a** What sources do you use for real estate management and industry information?  
[CATEGORIZED] (see DP12a\_opn above)

For DP12a\_1a\_1 through DP12a\_1a\_7

- 0 Not mentioned
- 1 Mentioned
- 6 Programmed skip
- 8 Don't know

- \*DP12a\_1a\_1** Web search
- \*DP12a\_1a\_2** Real estate or trade publications/magazines/newspapers
- \*DP12a\_1a\_3** Real estate organizations/Trade associations/Management companies
- \*DP12a\_1a\_4** Government regulations
- \*DP12a\_1a\_5** Tradeshow
- \*DP12a\_1a\_6** Word of mouth
- \*DP12a\_1a\_7** None

**DP13** Do you or your company have a policy that specifies energy efficient equipment should be purchased when purchasing new equipment, such as appliances, heating and cooling systems, and lighting for multifamily properties?

- 1 Yes
- 2 No [SKIP TO C1]
- 8 Don't know [SKIP TO C1]
- 9 Refused [SKIP TO C1]

**DP14\_opn**    What is the policy?

[PROBE FOR TYPES OF EQUIPMENT AND SPECIFICS ON EFFICIENCY LEVELS.]

[RECORD RESPONSE VERBATIM]

## COMMON AREAS

**C1**

Next, I'd like to ask you about some common area amenities that you may or may not have at this multifamily property.

Are there any TVs in common areas on this property, such as in a clubhouse, exercise room, or rental office?

- |    |            |              |
|----|------------|--------------|
| 1  | Yes        |              |
| 2  | No         | [SKIP TO C4] |
| -8 | Don't know | [SKIP TO C4] |
| -9 | Refused    | [SKIP TO C4] |

**C2** How many of each of the following types of entertainment equipment are located in common areas? [READ LIST]

For C2a through C2k

— [0-75]

-6 Programmed skip

-8 Don't know

-9 Refused

**C2a** # of Standard tube TVs

**C2b** # of Flat screen Plasma TVs

**C2c** # of Flat screen LCD or LED TVs

**C2d** # of Projection TVs [NOT projectors]

**C2e** # of Cable, satellite, or set-top box

**C2f** # of DVR; for example, TiVo

**C2g** # of DVD or Blu-Ray player

**C2h** # of VCR

**C2i** # of Digital TV converter box

**C2j** # of Video gaming system [PS3, PlayStation, Nintendo, XBOX, Wii]

**C2k** # of Smart strips [a power strip with sensor to save electricity]

**C4** Are there any fireplaces in common areas on this property?

- |    |            |              |
|----|------------|--------------|
| 1  | Yes        |              |
| 2  | No         | [SKIP TO C6] |
| -8 | Don't know | [SKIP TO C6] |
| -9 | Refused    | [SKIP TO C6] |

**C5** How many of each of the following types of fireplaces are located in common areas? [READ LIST]

For C5a through C5c

- |     |                 |  |
|-----|-----------------|--|
| ___ | [0-75]          |  |
| -6  | Programmed skip |  |
| -8  | Don't know      |  |
| -9  | Refused         |  |

**C5a** # of wood fireplaces

**C5b** # of gas fireplaces [natural gas and/or propane]

**C5c** # of electric fireplaces

**C6** Is there a common kitchen at this property?

- |    |            |              |
|----|------------|--------------|
| 1  | Yes        |              |
| 2  | No         | [SKIP TO C8] |
| -8 | Don't know | [SKIP TO C8] |
| -9 | Refused    | [SKIP TO C8] |

**C7** How many of each of the following types of kitchen appliances are located in common areas?

For C7a through C7c

- [0-75]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C7a** # of refrigerators

**C7b** # of microwaves

**C7c** # of stoves

**C8** Is there an exercise room or gym at this property?

- 1 Yes
- 2 No [SKIP TO C10]
- 8 Don't know [SKIP TO C10]
- 9 Refused [SKIP TO C10]

**C9** How many exercise machines that are run on electricity, such as treadmills and elliptical machines, are available for tenant's use?

- # of machines [0-75]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C10** Do you have a swimming pool with a filtering system for your residents' use?

- |    |            |               |
|----|------------|---------------|
| 1  | Yes        |               |
| 2  | No         | [SKIP TO C16] |
| -8 | Don't know | [SKIP TO C16] |
| -9 | Refused    | [SKIP TO C16] |

**C11** Does the pool have a pool pump?

- |    |                 |               |
|----|-----------------|---------------|
| 1  | Yes             |               |
| 2  | No              | [SKIP TO C13] |
| -6 | Programmed skip |               |
| -8 | Don't know      | [SKIP TO C13] |
| -9 | Refused         | [SKIP TO C13] |

**C12** Is the pool pump a high efficiency pool pump?

- |    |                 |
|----|-----------------|
| 1  | Yes             |
| 2  | No              |
| -6 | Programmed skip |
| -8 | Don't know      |
| -9 | Refused         |

**C13**

Does the pool have an automatic timer that controls the time of day that the pool pump operates?

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C14** Does the pool have a heater?

- 1 Yes
- 2 No [SKIP TO C16]
- 6 Programmed skip
- 8 Don't know [SKIP TO C16]
- 9 Refused [SKIP TO C16]

**C15** What type of fuel does the pool heater use? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Solar
- 5 Some other fuel [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C15\_5\_oth** Description of other type of fuel used by pool heater (see C15 above)

**C16** Is there a hot tub, spa, or Jacuzzi for your residents' use?

- 1 Yes
- 2 No [SKIP TO CW1]
- 8 Don't know [SKIP TO CW1]
- 9 Refused [SKIP TO CW1]

**C17** What type of fuel is used to heat the water in your hot tub, spa, or Jacuzzi?  
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Solar
- 5 Some other fuel [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**C17\_5\_oth** Description of other type of fuel to heat hot tub, spa, or Jacuzzi (see C17 above)

|                                   |
|-----------------------------------|
| <b>CLOTHES WASHING AND DRYING</b> |
|-----------------------------------|

**CW1** Does the property have a common area laundry?

- 1 Yes
- 2 No [SKIP TO M1]
- 8 Don't know [SKIP TO M1]
- 9 Refused [SKIP TO M1]

**CW2** How many clothes washers are in the common area laundry?

- \_\_\_ # of clothes washers [0-75] [IF ZERO SKIP TO CW6]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW3** Are the majority of clothes washer[s] one that you load from the top or from the front?

- 1 Top loading
- 2 Front loading
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW4** About how old are the majority of clothes washers?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW5**

[ASK IF E1=2 OR E1=3 AND CW4 = 1, 2, OR 3] Are the majority of the clothes washer[s] ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW6**

How many clothes dryers are in the common area laundry room?

- \_\_\_ # of clothes dryers [0-75] [IF ZERO SKIP TO CW9]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW6a**

[SKIP IF CW2 OR CW6 <> 0] [Respondent answered that they have zero washers and zero dryers in their laundry area.]

[PRESS 1 TO SKIP BACK TO CHANGE CW1 TO NOT 'YES']

**CW7** What type of fuel do the majority of clothes dryers use?  
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas [from underground pipes]
- 3 Propane (bottled gas)
- 4 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW7\_4\_oth** Description of other type of fuel used by clothes dryers (see CW7 above)

**CW8** About how old are the majority of clothes dryers?  
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW9** Do you own or lease the clothes [IF CW2<>0: washers] and [IF CW6<>0: dryers]?

- 1 Own all
- 2 Lease all
- 3 Own some and lease some
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW10** Does the tenant pay for laundry, or is it included in rent?

- 1 Tenant pays for laundry
- 2 Laundry is included in rent
- 3 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

**CW10\_3\_oth** Description of other type of laundry payment setup (see CW10 above)

#### MISCELLANEOUS

**M1** Do you use a generator, including natural gas, solar, or wind, to supply your electric needs?

- 1 Yes
- 2 No
- 8 Don't know
- 9 Refused

**M2**

Does your property have solar panels, including PV or active solar for hot water or space heating?

- 1 Yes
- 2 No
- 8 Don't know
- 9 Refused

**M3** How many of each of the following types of computer and office equipment are available for tenant use or in the business office? [READ LIST]

For M3a through M3k

— [0-75]  
-8 Don't know  
-9 Refused

**M3a** Desktop computer  
**M3b** Laptop computer  
**M3c** iPads, tablet computers  
**M3d** CRT computer monitors  
**M3e** LED or LCD flat screen computer monitors  
**M3f** Combination printer/copier/scanner/fax machine  
**M3g** Individual printer  
**M3h** Individual copier  
**M3i** Individual fax machine  
**M3j** Individual scanner  
**M3k** Any other type of computer or home office equipment? [SPECIFY]  
**M3k\_a\_opn** Description of any other type of computer or home office equipment (see M3k above)

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

**M4a\_1** [ASK IF S6≠1 and S17≠11, 12, OR 13 [not new construction]] NYSERDA is offering select multifamily building developers and owners in your area a \$150 gift card to allow a trained technician to visit their property to gather more detailed information about the property's energy usage in common areas, which is around a 3 hour effort. As part of this visit the technician will need to review the property's energy bills and will look at the building's heating, cooling, and water heating equipment; lighting; and weatherization. The technician would also like to look at about 5 tenant units to better understand the type of energy using equipment in these units. Since this will increase the time we need to spend at your property, in addition to your \$150 gift card, we would provide additional \$40 gift cards per tenant unit visited.

If you are willing to allow us to visit your property, we will contact you again in the next week to set up an appointment. We want to emphasize, during the visit there will be no attempt to sell you anything. The information gathered will be used to evaluate and improve energy efficiency programs offered by NYSERDA and your utility.

- 1 Continue
- 6 Programmed skip

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

**M4a\_2** [[ASK IF S6≠1 and S17≠11 and S17≠12] Would you be willing to allow a trained technician to visit your site?

- 1 Yes
- 2 Possibly, but I need more information
- 3 No
- 6 Programmed skip

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

**M4b\_1** [ASK IF S6=1 or S17=11 or S17=12 [is new construction]] NYSERDA is offering select multifamily building developers and owners in your area a \$300 gift card to allow a trained technician to visit their property to gather more detailed information about the property's energy usage in common areas. As part of this visit, the technician will need to review the property's energy bills and will look at the building's heating, cooling, and water heating equipment; lighting; and weatherization. In addition to gathering data on the property's common areas, a small sample of tenant units may also be needed. This visit could take up to four, or more hours depending upon the size of the property.

If you are willing to allow us to visit your property, we will contact you again in the next week to set up an appointment. We want to emphasize, during the visit there will be no attempt to sell you anything. The information gathered will be used to evaluate and improve energy efficiency programs offered by NYSERDA and your utility.

- 1 Continue
- 6 Programmed skip

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

**M4b\_2** [ASK IF S6=1 or S17=11 or S17=12] Would you allow a trained technician to visit your site?

- 1 Yes
- 2 Possibly, but I need more information
- 3 No
- 6 Programmed skip

**M5a** [ASK IF M4a\_2=1 or 2 or M4b\_2=1 or 2] Is the following the most accurate information for [COMPLEX\_NAME]?

**M5a\_opn**  
**M5c\_opn**  
**M5d\_opn**  
**M5e\_opn**

|              | Information on file | Copied / New Information |
|--------------|---------------------|--------------------------|
| Complex name | [COMPLEX_NAME]      |                          |
| Address      | [RENTADDR]          |                          |
| City         | [RENTCITY]          |                          |
| Zip code     | [RENTZIPC]          |                          |

**M5b** [ASK IF M4a\_2=1 or 2 or M4b\_2=1 or 2] Who should we contact to schedule a visit at [COMPLEX\_NAME]?

**M5b\_opn**  
**M5f\_opn**  
**M5g\_opn**  
**M5h\_opn**

|              | Information on file | Copied / New Information |
|--------------|---------------------|--------------------------|
| Contact name | [CONTACT NAME]      |                          |
| Office phone | [PHONE]             |                          |
| Cell phone   |                     |                          |
| Email        |                     |                          |

[Note: New text about site visit contact added on 02/10/2014.]

**M6** Thank you, again, for your help with this important study. [IF M4a\_2 OR M4b\_2 = 1  
OR 2: Also thank you for your willingness to participate in a site visit. Someone will  
be contacting you within the next week to schedule the appointment.

Do you have any comments that you would like to share?

- 1 Record comments [SPECIFY]
- 2 No comments

**M7** [DO NOT READ] [INTERVIEWER: RECORD GENDER]

- 1 Male
- 2 Female

## Appendix D: On-site Inspection Data Collection Instrument

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2:04 PM

38%

MobilePSD\_NYBaseline

### NYSERDA Baseline Study — List of Inspections

|                                                                                                                                               |          |                     |            |       |
|-----------------------------------------------------------------------------------------------------------------------------------------------|----------|---------------------|------------|-------|
| 11/19/2013                                                                                                                                    | 9:00 AM  | 2603 Caldwell Road  | Belmont    | 14813 |
| <div> <div>Case ID: Demo046</div> <div>Type: Existing Multi-Family</div> <div>Status: New</div> <div>Inspector: sfauditor</div> </div>        |          |                     |            |       |
| 11/20/2013                                                                                                                                    | 12:00 PM | 1108 Bictown Road   | Mineola    | 11501 |
| <div> <div>Case ID: Demo084</div> <div>Type: Existing Single Family</div> <div>Status: Submitted</div> <div>Inspector: sfauditor</div> </div> |          |                     |            |       |
| 11/20/2013                                                                                                                                    | 1:00 PM  | 3315 Small Street   | New York   | 10004 |
| <div> <div>Case ID: Demo027</div> <div>Type: Existing Single Family</div> <div>Status: Submitted</div> <div>Inspector: sfauditor</div> </div> |          |                     |            |       |
| 11/21/2013                                                                                                                                    | 10:00 AM | 2028 James Street   | Wellsville | 14895 |
| <div> <div>Case ID: Demo094</div> <div>Type: Existing Single Family</div> <div>Status: Submitted</div> <div>Inspector: sfauditor</div> </div> |          |                     |            |       |
| 11/25/2013                                                                                                                                    | 10:00 AM | 1817 Geraldine Lane | New York   | 10011 |
| <div> <div>Case ID: Demo065</div> <div>Type: Existing Single Family</div> <div>Status: New</div> <div>Inspector: sfauditor</div> </div>       |          |                     |            |       |

Go to Tools

Hide Samples

Hide Submitted

Show All

Download Active Inspections

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2:04 PM

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MobilePSD\_NYBaseline

3315 Small Street, New York

Envelope

Foundation

Slab

Floors

Rim/Band

Walls

Ceiling

Windows

Doors

IR/Notes

Year built

1936

Home Type

Single Family Detached

Number of occupants

5

Number of bedrooms

8

Stories above grade

11

Avg. ceiling height (ft)

14

Cond. floor area (ft^2)

2400

Area Calculator

Architectural Style

Roof Material

Shingles

Roof Color

Dark

Roof Condition

Poor

Siding Material

Vinyl

Siding Color

Dark

Siding Condition

Good

Exterior Window Shading

Half of Windows Shaded

Wind Shielding of Home

Normal

Basement Type

Slab on Grade (none)

Significant Structural Features:

☐ Cape Style Knee Walls

☒ Split Level

☐ Balloon Frame

☐ Post and Beam

☐ Additions

☐ Room over Garage

☐ Vertical Chases

☐ Cantilevers

Garage type

None

Garage interior finish

NA

Connectivity of Boundary Wall

N/A- Not Attached

Connectivity of Ceiling

N/A- Not Attached

Connectivity of Duct

N/A- Not Attached

Attached garages

iPad

2:13 PM

36%

MobilePSD\_NYBaseline

3315 Small Street, New York

1 Clothes Washer - Count: 1 Type: Top Loading Make: Famous Brand

2 Refrigerator - Count: 1 Make: Famous Brand Cu Ft: 19 Style: Top

3 TV - Count: 1 Size: 36 Type: LED

4 Dishwasher - Count: 1 Efficiency: .49

to delete click

New

Appliance Completeness Checks

Refrigerator

Count

1

Manufacturer

Famous Brand

Model

123456-abc

Year Of Manufacture

2004

Known

Size (ft^3)

19

TypeOrStyle

Top Freezer

Water/Ice Dispenser

No

EnergyStar

Yes

Energy Guide Annual Use (\$)

510

Location

Conditioned

Name Plate Photo

Appliance Notes:

NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975.

To learn more about NYSERDA's programs and funding opportunities, visit [nyserda.ny.gov](http://nyserda.ny.gov) or follow us on Twitter, Facebook, YouTube, or Instagram.

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