Fannie Mae Multifamily Energy and Water Market Research Survey:

Survey Database User Manual

February 17, 2015

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I.   Introduction

In 2012, Fannie Mae conducted the Multifamily Energy and Water Market Research Survey (the "Survey"). The goal of the Survey was to provide analytical information that could be used by the owners of multifamily properties to assist in the reduction of energy and water consumption and costs, and to minimize impact of multifamily properties on the environment.   Additionally, the Survey was launched to assist the U.S. Environmental Protection Agency (EPA) in the development of the ENERGY STAR® Score for Multifamily Housing.   More than 1,000 multifamily property owners and managers submitted responses describing the characteristics of their properties and providing energy and water consumption and costs from January 2011 through December 2011.

Fannie Mae shared the Survey data with EPA to explore the development of the 1-100 ENERGY STAR® Score for Multifamily Housing[1].   In 2014, the EPA successfully launched the ENERGY STAR® Score based on the data in the Survey.   Fannie Mae also analyzed the Survey data and published findings on energy and water consumption costs and trends in multifamily properties in the white paper, Transforming Multifamily Housing: Fannie Mae's Green Initiative and ENERGY STAR® for Multifamily[2]. The survey data and supporting documents were made publicly available in 2015 to enable further research on energy and water consumption and associated costs at multifamily properties.

This user manual provides a summary of key information about the Survey database.   All identifying property information has been removed to maintain the confidentiality of those who submitted data.   The database includes only the data reported at the time of the Survey; it has not been updated over time.

Fannie Mae would like to extend special thanks to the multifamily owners and property management firms who submitted data to the Survey.   We are also grateful for the support for the Survey from the Urban Land Institute, the National Multifamily Housing Council, and the Commercial Real Estate Finance Council.

II.   About Fannie Mae's Green Initiative

Fannie Mae Multifamily Mortgage Business launched the Green Initiative in 2010.   The mission of the Fannie Mae Multifamily Green Initiative is to enhance the quality, affordability, and environmental sustainability of multifamily housing in the United States. The Green Initiative provides leadership in the multifamily industry by offering loans for smart property improvements, and delivering innovative tools to measure and capture the value of energy and water efficiency.

Our partnership with the EPA resulted in the ENERGY STAR® Score for Multifamily Housing, a national rating system that is publicly accessible, nationally recognized, and built on statistically-based quantifiable data. Fannie Mae is proud to be an ENERGY STAR® Partner, and will continue to support the EPA and other industry partners to help increase financing options and other tools that will enhance the energy-efficiency and affordability of rental housing in the United States.

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[1]   Information about the ENERGY STAR Score for Multifamily Housing in the United States is available at http://www.energystar.gov/buildings/tools-and-resources/energy_star_score_multifamily_housing_united_states
[2] "Transforming Multifamily Housing: Fannie Mae's Green Initiative and ENERGY STAR® for Multifamily" is available at www.fanniemaegreeninitiative.com

III.   About the Survey

Fannie Mae included an instructional booklet, instructions on how to request 12 months of energy and water data, and a return envelope with the original Market Research Energy and Water Survey Questionnaire. The following Survey materials are available on the [Fannie Mae Green Initiative website](#):

- **2012 Multifamily Market Research Energy and Water Survey Questionnaire:** This document includes the full text of the questions included in the Survey, as well as the multiple choice options provided for some questions.

- **Instructional Booklet:** This document includes detailed instructions on providing energy and water data, as well as more detailed definitions for the terms used in some of the Survey questions. This material is intended to be used in conjunction with the database and this manual.

Fannie Mae received survey response submissions from 1,163 multifamily properties. It is important to note that some properties did not provide answers to all questions on the survey, and submitted partial information on energy or water consumption, associated costs, and property characteristics. Of the total responses received, 672 properties provided energy and water data, 278 properties provided energy data only, 64 properties provided water data only, and 149 properties completed only property characteristic information and provided no energy or water data. All submissions were reviewed to identify appropriate data that was suitable for analysis and publication.

Properties that did not provide at least one of the most critical property characteristics, either square footage or the number of units, were excluded. Additionally, a number of properties provided incomplete or incorrect data for energy and water use and cost. If a property did not provide a full twelve months of energy and/or water data, the incomplete data was removed from the database. If a property provided data that represented extreme outliers for energy use, water use, or cost values, the extreme data was removed from the database.[3] A total of 955 properties are included the published database, all of which were provided to the EPA for the development of the ENERGY STAR® score.

IV.   About the Survey Database

To simplify the database for ease of use, Fannie Mae reviewed and, in some cases, edited data prior to publication. These changes did not impact the data used for development of the ENERGY STAR® score and the Fannie Mae white paper; only data excluded from those analyses was affected. Examples of changes include:

- **Removed columns:** No respondents reported energy use for survey questions about District Hot Water, District Chilled Water, Wood, Kerosene, or On-Site Electricity, so these fields were removed. Similarly, respondents were asked to report water consumption using one of twelve options for Type of Water Use (listed in Appendix A), but no respondents reported use for Alternative Water Generated On-Site or Municipally Reclaimed Water. The twelve types were consolidated into three categories based on the area served (Indoor, Outdoor, or All Uses).

- **Free response options:** Certain multiple choice questions in the survey allowed a free response answer in addition to the choices provided. Fannie Mae reviewed the free response answers provided and, in some cases, modified the values to enhance clarity. For example, Question 4 of the survey is a multiple choice question with the following allowable values: (i) Rental, (ii) Cooperative, (iii) Condo, (iv) None of the above (free response), and (v) More than

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[3] The outliers removed as part of Fannie Mae's analysis differed from outliers applied by EPA during the development of the ENERGY STAR score for multifamily properties. Due to this and other adjustments to the data, there are slight differences between the summary statistics from the database and the survey results published in Fannie Mae's 2014 white paper.

one of the above (free response). Based on answers to the free response options, some properties were classified as "Rental/Condo" in the database.

- **Missing or incomplete data:** Data for certain fields was not provided by respondents, or incomplete data was provided. Fields with missing or incomplete data were populated with "Not Provided" for text fields, and "-9999" for number fields.

V.   Survey Database Layout

The survey data is available in *MEWMR-Survey-Database.xlsx*, a Microsoft Excel file database. The Survey Database Description Table on the following pages contains the following information about each database field:

- **Column in Database:** The letter of the column in the database where the field can be found.

- **Field:** The title of the column in the database. Fields in the table are color coded to match the Field Types in the database. Gray columns contain property characteristics data, green columns contain energy information, and light blue columns contain water information. Dark blue columns contain data that was included in development of the ENERGY STAR® Score.

- **Field Type:** Indicates whether the field is a property characteristic, energy characteristic, water characteristic, or included in the development of the ENERGY STAR® Score.

- **Data Type:** Indicates the type of information collected, including whether the data is a number or text. For text fields, a description of the type of question that was asked is provided (e.g., yes/no question, multiple choice, free response).

- **Description:** A detailed description of the data collected.

- **Source:** The source of the data. This column links to the question number in the original survey questionnaire, or indicates whether the information was derived from other responses or referenced from alternative sources.

VI.   Additional Resources

To find out more:

- Green Initiative Website: www.fanniemaegreeninitiative.com

- Green Initiative e-mail: green_initiative@fanniemae.com

- ENERGY STAR® Multifamily Score: http://www.energystar.gov/buildings/tools-and-resources/energy_star_score_multifamily_housing_united_states

VII. Survey Database Description Table

Database Column	Field	Field Type	Data Type	Description	Source
A	Property ID	Property characteristic	Number	Unique identifier assigned to each property.	Derived
B	12 months of energy data provided	Property characteristic	Text: Y/N	Indicator of whether energy data covers a full 12 months. Determined based on response to Q11 and review of energy data provided.	Derived
C	Energy Space Served	Property characteristic	Text	Space served by energy data provided. Properties were classified as providing Whole Property data, Common Space Only, or Not Providing Energy based on response to Q12.	Derived
D	12 Months of Water Data Provided	Property characteristic	Text: Y/N	Indicator of whether water data covers a full 12 months. Determined based on response to Q16 and review of water data provided.	Derived
E	Water Space Served	Property characteristic	Text	Space served by water data provided. Properties were classified as providing Indoor data, Outdoor data, Indoor/Outdoor, or Not Providing Water based on response to Q17.	Derived
F	State	Property characteristic	Text: Free Response	State where property is located.	Q1
G	Region	Property characteristic	Text	U.S. Census region associated with the state where the property is located.	Referenced
H	CDD	Property characteristic	Number	Cooling degree days (CDD). Determined by U.S. EPA based on property ZIP Code.	Referenced
I	HDD	Property characteristic	Number	Heating degree days (HDD). Determined by U.S. EPA based on property ZIP Code.	Referenced
J	Year Built (Range)	Property characteristic	Text	Year when property was built. Responses are presented as a decade range (e.g., 1961-1970, 1971-1980).	Q3
K	Primary Property Type Present at Your Property	Property characteristic	Text: Multiple Choice, Single Response	Property type. Allowable values: Rental, Cooperative, Condo, None of the above, and More than one of the above. Based on additional details that were provided, some properties were classified as "Rental/Condo." Definitions are included in Appendix A.	Q4

Database Column	Field	Field Type	Data Type	Description	Source
L	Primary Resident population	Property characteristic	Text: Multiple Choice, Single Response	Resident population. Allowable values: No majority population/general purpose housing, Military, Student, Senior/Independent Living, Special Accessibility Needs, and Other dedicated housing that represents the majority of the population. Based on additional details that were provided, some properties were classified as "No majority/general purpose housing." Definitions are included in Appendix A.	Q5
M	Government Subsidies	Property characteristic	Text: Y/N	Indicator of whether the property received one or more types of public, local state, or federal affordable housing subsidies for some or all units.	Q6
N	Utility Subsidies	Property characteristic	Text: Y/N	Indicator of whether the property or residential tenants receive a government-provided subsidy payment for utility costs.	Q7
O	Rent-controlled/rent stabilized?	Property characteristic	Text: Y/N	Indicator of whether the property is rent controlled or rent stabilized.	Q8
P	Affordable?	Property characteristic	Text	Indicator of whether a property is identified as affordable through question Q6, or based on a cross-check with Fannie Mae records. Properties are classified as Affordable or Market Rate.	Derived
Q	Green Building Certification?	Property characteristic	Text: Multiple Choice, Multiple Response	Indicator of whether green building certification was received. Allowable values: EarthCraft, Enterprise Green Communities Criteria, Green Globes, GreenPoint, Home Energy Rating System, LEED, National Green Building Program, ENERGY STAR, and Other.	Q9
R	Fitness Center	Property characteristic	Text: Y/N	Indicator of whether there is a Fitness Center on the property.	Q13
S	Fitness Center Energy Included?	Property characteristic	Text: Y/N	Indicator of whether the energy use associated with the fitness center is included in the energy consumption data provided.	Q13a
T	Outdoor recreation area with lights?	Property characteristic	Text: Y/N	Indicator of whether there is an outdoor recreation area with lights on the property.	Q14
U	Outdoor rec lights energy included?	Property characteristic	Text: Y/N	Indicator of whether the energy use associated with the outdoor recreation areas is included in the energy consumption data provided.	Q14a
V	Unmetered water sources	Property characteristic	Text: Multiple Choice, Multiple Response	Unmetered water sources used at the property. Allowable values: Rainwater harvesting (e.g. rain barrels, cisterns), Wells, Retention ponds, Other, and None.	Q18
W	Total amount of irrigated areas	Property characteristic	Number	Total amount of irrigated area. Areas that are not irrigated or are not on the property grounds have a value of 0.	Q19
X	Units for irrigated areas	Property characteristic	Text: Multiple Choice, Single Response	Units for irrigated area reported in Q19. Allowable values: Acres and Square Footage.	Q19a

Database Column	Field	Field Type	Data Type	Description	Source
Y	Types of irrigated areas	Property characteristic	Text: Multiple Choice, Multiple Response	Type of irrigated area. Allowable values: Garden/Shrub/Flower Beds, Trees, Open Space/Grass Lawns, and Other.	Q19b
Z	Other irrigated areas	Property characteristic	Text: Free Response	Type of irrigated area. Free response option for respondents that answered "Other" for Q19b. See above for allowable values.	Q19b
AA	Total Gross Internal Floor Area	Property characteristic	Number	Total gross internal floor area. Definitions are included in Appendix A.	Q20
AB	Common Area Floor Area	Property characteristic	Number	Common area floor area. Definitions are included in Appendix A. Based on answer to Q22. Some respondents provided percentage values rather than square feet; these were converted to square feet.	Derived
AC	Total Gross Rentable Retail and Commercial floor area	Property characteristic	Number	Total gross rentable retail and commercial floor area. Definitions are included in Appendix A.	Q23
AD	Total open parking floor area	Property characteristic	Number	Floor area of open parking lots. Definitions are included in Appendix A.	Q24a
AE	Total non-enclosed parking floor area	Property characteristic	Number	Floor area of non-enclosed parking. Definitions are included in Appendix A.	Q24b
AF	Total enclosed parking floor area	Property characteristic	Number	Floor area of enclosed parking. Definitions are included in Appendix A.	Q24c
AG	Parking hours per week	Property characteristic	Number	Number of hours parking can be accessed by residents.	Q24d
AH	Presence of parking	Property characteristic	Text: Y/N	Indicator of whether parking is present. Some respondents did not provide detailed parking area information, but confirmed the presence/absence of parking in a follow-up question. For respondents that did not specifically answer this follow-up question, a value was determined based on Q24.	Derived
AI	Building Type	Property characteristic	Text: Multiple Choice, Single Response	Type of building. Allowable values: High-rise building, Mid-rise building, Low-rise building, Garden, Towngarden, Townhouse, Single Family, and Other. Data was collected for up to 13 building types in each property. See Appendix A for definitions.	Q25a
AJ	If other, please specify	Property characteristic	Text: Free Response	Type of building. Free response option for respondents that answered "Other" for Q25a. See above for allowable values.	Q25a
AK	Number of buildings this applies to	Property characteristic	Number	Number of buildings associated with the building type in Q25a.	Q25b

Database Column	Field	Field Type	Data Type	Description	Source
AL	Number of floors above existing grade plan	Property characteristic	Number	Number of floors above ground, associated with the building type in Q25a.	Q25c
AM	Number of floors below existing grade plan	Property characteristic	Number	Number of floors below ground, associated with the building type in Q25a.	Q25d
AN	Number of units per building	Property characteristic	Number	Number of units per building, associated with the building type in Q25a. Includes every type of space livable by a resident including the super's or manager's apartment, model units, vacant, occupied and down units.	Q25e
AO – DH	Multiple	Property characteristic	Multiple	Repeat of fields described in Column AK-AP. Building type data was collected for up to 13 building types.	Multiple
DI	Total number of studio units	Property characteristic	Number	Number of studio/efficiency/junior bedroom units for all the buildings on the property. Defined as having a kitchen/living area with a separate bathroom. A junior 1 bedroom is defined as the same as a studio/efficiency with a separate space for sleeping and is usually separated by a half wall or temporary wall.	Q26a
DJ	Total number of 1 bedroom units	Property characteristic	Number	Number of 1 bedroom units for all the buildings on the property.	Q26b
DK	Total number of 2 bedroom units	Property characteristic	Number	Number of 2 bedroom units for all the buildings on the property.	Q26c
DL	Total number of 3 bedroom units	Property characteristic	Number	Number of 3 bedroom units for all the buildings on the property.	Q26d
DM	Total number of 4 bedroom units	Property characteristic	Number	Number of 4 or more bedroom units for all the buildings on the property.	Q26e
DN	Total average physical occupancy	Property characteristic	Text	Average physical occupancy percentage for the entire property. Some respondents provided a percentage value, while others provided a range (e.g., 90-100%).	Q27
DO	Building Type (Property Level)	Property characteristic	Text	Type of building identified for the entire property, as indicated by one of the following: High-rise, Mid-rise, Low-rise, Mixed. Determined based on the Building Type and Number of Floors provided in Q25. Low-rise properties include those that responded Garden, Townhouse, and Low-rise. Mixed was used to describe properties with no single building type.	Derived

Database Column	Field	Field Type	Data Type	Description	Source
DP	Total Number of Units	Property characteristic	Number	Number of units. Calculated based on the number of units of each configuration (e.g., studio, 1BR, 2BR, etc.) in Q26. Number of units was also provided by building type in Q25, but fewer respondents answered this question and the results were not as reliable. In some cases, respondents provided a total number of units instead of or in addition to a breakdown by bedroom configuration, in which case the total number of units was used.	Derived
DQ	Unit Range	Property characteristic	Text	Category based on the Total Number of Units. Results were classified as one of the following: 5-49, 50-99, 100-149, 150-299, or 300+ units.	Derived
DR	Unit Density	Property characteristic	Number	Number of units per thousand square feet	Derived
DS	Number of BRs	Property characteristic	Number	Total number of bedrooms. Sum of number of bedrooms in 1-bedroom units, 2-bedroom units, etc.	Derived
DT	Bedrooms/Unit	Property characteristic	Number	Total number of bedrooms divided by total number of units	Derived
DU	Average Floor Area/Unit	Property characteristic	Number	Total gross internal floor area divided by total number of units.	Derived
DV	Pool type	Property characteristic	Text: Multiple Choice, Single Response	Type of pool. Allowable values: Recreational, Short Course, Olympic, and Other. Data was provided for up to 3 pool types in each property.	Q28a
DW	If other, please specify:	Property characteristic	Text: Free Response	Type of pool. Free response option for respondents that answered "Other" for Q28a. See above for allowable values.	Q28a
DX	Pool location	Property characteristic	Text: Multiple Choice, Single Response	Pool location. Allowable values: indoor and outdoor.	Q28b
DY	Is the pool heated?	Property characteristic	Text: Y/N	Indicator of whether the pool is heated.	Q28c
DZ	Energy consumption and cost included?	Property characteristic	Text: Y/N	Indicator of whether energy consumption and cost for the pool were included in the data provided.	Q28d
EA	Water consumption and cost included?	Property characteristic	Text: Y/N	Indicator of whether water consumption and cost for the pool were included in the data provided.	Q28e
EB	Number of months in use in 2011	Property characteristic	Number	Number of months the pool was in use in 2011.	Q28f
EC	How many pools does this apply to?	Property characteristic	Number	Number of pools associated with the building type in Q85a.	Derived

Database Column	Field	Field Type	Data Type	Description	Source
ED-ES	Multiple	Property characteristic	Multiple	Repeat of fields described in Column DX-EE. Pool data was provided for up to 3 pool types.	Multiple
ET	Presence of a pool	Property characteristic	Text: Y/N	Indicator of whether a pool is present. Some respondents did not provide detailed pool information, but confirmed the presence/absence of a pool in a follow-up question. For respondents that did not specifically answer this follow-up question, a value was determined based on Q28.	Derived
EU	Number of Dishwasher Hookups	Property characteristic	Number	Number of dishwasher hookups for all of buildings on the property (rental units, common buildings commercial/retail space). Includes inoperable and operable units.	Q29a
EV	Presence of a Dishwasher	Property characteristic	Text: Y/N	Indicator of whether dishwashers are present. Some respondents did not provide detailed dishwasher information, but did confirm the presence/absence of dishwashers in a follow-up question. For respondents that did not specifically answer this follow-up question, a value was determined based on Q29a.	Derived
EW	Location of Dishwashers	Property characteristic	Text: Multiple choice, Single Response	Location of dishwashers. Some respondents did not provide detailed dishwasher information, but did provide location information in a follow-up multiple choice question. Allowable values: Residential, Common Area, Residential and Common Area. For respondents that did not specifically answer this follow-up question, a value was determined based on Q29b.	Derived
EX	Number of Laundry Hookups	Property characteristic	Number	Number of laundry hookups for all of the buildings on the property. Includes both pay-per-use and free washer, dryer or combination units with a unique plug.	Q29b
EY	Presence of Laundry Hookups	Property characteristic	Text: Y/N	Indicator of whether laundry hookups are present. Some respondents did not provide detailed laundry hookup information but did confirm the presence/absence of laundry hookups in a follow-up question. For respondents that did not specifically answer this follow-up question, a value was determined based on Q29b.	Derived
EZ	Location of Laundry Hookups	Property characteristic	Text: Multiple Choice, Single Response	Location of laundry hookups. Some respondents did not provide detailed laundry hook up information but did provide location information in a follow-up multiple choice question. Allowable values: Residential, Common Area, Residential and Common Area, and Not Determined. For respondents that did not specifically answer this follow-up question, a value was determined based on Q29b.	Derived

Database Column	Field	Field Type	Data Type	Description	Source
FA	Number of Elevators	Property characteristic	Number	Number of elevators at the property. Includes penthouse and freight elevators.	Q29c
FB	Number of resident bathrooms	Property characteristic	Number	Number of resident bathrooms at the property. Includes both half and full in residential units.	Q29d
FC	Common area restrooms	Property characteristic	Number	Number of common area restrooms at the property. Half bathrooms counted as 1 full bathroom.	Q29e
FD	Total number of computers in common area	Property characteristic	Number	Number of computers at the property. Includes leasing and business centers and retail/commercial space and all computers in staff and common area spaces.	Q29f
FE	Presences of on-site commercial cooking	Property characteristic	Text: Y/N	Indicator of whether on-site commercial cooking is present, such as a restaurant or dining facility.	Q30
FF	Number of walk-in refrigeration/freezer units	Property characteristic	Number	Number of walk-in refrigeration/freezer units at the property. Defined as large units used to store refrigerated goods which a person can walk into.	Q30a
FG	Percentage of all residential units have kitchens	Property characteristic	Number	The percentage of all residential units that have kitchens. Includes kitchen that have a stove top/cook top, at least one cupboard, small counter space, any size refrigerator and a sink (separate from the bathroom sink).	Q31
FH	Percent of gross floor area that is heated	Property characteristic	Text	Percent of gross indoor floor area that is heated by mechanical heating equipment. Some respondents provided a percentage value, while others provided a range (e.g., 90-100%).	Q32a
FI	Percent of gross floor area that is cooled	Property characteristic	Text	Percent of gross indoor floor area that is cooled by mechanical cooling equipment. Some respondents provided a percentage value, while others provided a range (e.g., 90-100%).	Q32b
FJ	Who pays hot water?	Property characteristic	Text: Multiple Choice, Single Response	Who pays for hot water costs? Allowable values include: Tenant--directly or individually metered, Owner--master metered or invoiced, Tenant through Ratio Utility Billing System (RUBS), and Other.	Q33a
FK	Who pays plug load?	Property characteristic	Text: Multiple Choice, Single Response	Who pays for plug load? Allowable values include: Tenant--directly or individually metered, Owner--master metered or invoiced, Tenant through Ratio Utility Billing System (RUBS), and Other.	Q33b
FL	Who pays cooling?	Property characteristic	Text: Multiple Choice, Single Response	Who pays for cooling costs? Allowable values include: Tenant--directly or individually metered, Owner--master metered or invoiced, Tenant through Ratio Utility Billing System (RUBS), and Other.	Q33c

Database Column	Field	Field Type	Data Type	Description	Source
FM	Who pays heating system?	Property characteristic	Text: Multiple Choice, Single Response	Who pays for heating costs? Allowable values include: Tenant--directly or individually metered, Owner--master metered or invoiced, Tenant through Ratio Utility Billing System (RUBS), and Other.	Q33d
FN	Residential hot water system	Property characteristic	Text: Multiple Choice, Single Response	Type of hot water system that supplies the residential units. Allowable values: Combined with Heating Boiler, Domestic Hot Water heater tank (standard), Domestic Hot Water heater tank (condensing), Domestic Hot Water heater heat pump, Domestic Hot Water heater central tankless, Hot Water heater point of use tankless, Central steam heat exchanger, Solar thermal (if more than 50% of the DHW load), Co-generation/Combined Heat and Power, and Other.	Q34
FO	Other hot water system	Property characteristic	Text: Free Response	Type of hot water system. Free response option for respondents that answered "Other" for Q34. See above for allowable values.	Q34
FP	Primary hot water fuel type	Property characteristic	Text: Multiple choice, Single Response	The primary hot water fuel type used to heat domestic water for the resident units. Allowable values: Electricity, Natural Gas, Propane/Liquid Propane, District Hot Water, District Steam, Fuel Oil No. 1 and No. 2, Fuel Oil No. 4, Fuel Oil No. 5 and No. 6, Coal (anthracite, bituminous), Kerosene, Wood/Wood Pellets, Solar, Other (ex: coke).	Q34a
FQ	Other hot water fuel type	Property characteristic	Text: Free Response	The primary hot water type used to heat domestic water for the residents. Free response for respondents that answered "Other" for Q34a. See above for allowable values.	Q34a
FR	Residential cooling system	Property characteristic	Text: Multiple Choice, Single Response	The type of cooling system used by residential units. Allowable values: Window A/C, Thru the Wall A/C, Individual Split System (air source heat pump), Individual Split System (ground source/geothermal heat pump), Ductless Split System, Central System—Electric Chiller—Air Cooled, Central System—Electric Chiller—Water Cooled, Central System—Absorption Chiller, Conventional Water Source Heat Pumps with Cooling Tower, Other, and No cooling system.	Q35
FS	Other cooling system	Property characteristic	Text: Free Response	The type of cooling system used by residential units. Free response for respondents that answered "Other" for Q35. See above for allowable values.	Q35
FT	Presence of commercial cooling tower	Property characteristic	Text: Y/N	If a property has a commercial cooling tower.	Q36

Database Column	Field	Field Type	Data Type	Description	Source
FU	Residential heating system	Property characteristic	Text (Multiple Choice)	The type of heating system used in residential units. Allowable values: Forced Air Furnace, Hot Water Boiler—Radiator/Baseboard, Hot Water Boiler—Fan Coil/PTAC, Steam Boiler to Hot Water—Baseboard/Radiator, Steam Boiler to Hot Water—Fan Coil/PTAC, Steam—1-pipe, Steam—2-pipe, Heat Pump—Air Source, Heat Pump—Ground Source, Electric Resistance, Individual Split System (air source heat pump), Individual Split System (ground source/geothermal heat pump), Heating stove burning wood, coal or coke, Portable electric heaters, Portable kerosene heaters, Fireplace, and Other.	Q37
FV	Other residential heating system	Property characteristic	Text: Multiple Choice, Single Response	The type of heating system used in residential units. Free response for respondents that answered "Other" for Q37. See above for allowable values.	Q37
FW	Renovation 1 (year):	Property characteristic	Number	Year the last major renovation was completed.	Q38
FX	Type of renovation	Property characteristic	Text: Multiple Choice, Multiple Response	Type of renovation that took place. Allowable values: Cosmetic (Kitchen cabinets, flooring, countertops, wall coverings, etc.), Envelope (Doors, windows, roof, siding, insulation), Mechanical, Electrical, Plumbing—Central Plant (HVAC), Mechanical, Electrical, Plumbing—Tenant Units (Lighting, appliances, plumbing fixtures), and Other.	Q38a
FY	Other type of renovation	Property characteristic	Text: Free Response	The type of renovation that took place. Free response for respondents that answered "Other" for Q38a. See above for allowable values.	Q38a
FZ	Renovation of Energy Systems	Property characteristic	Text: Y/N	Indicator of whether renovations occurred that affected energy use. Properties with either no renovations or only cosmetic renovations were designated as having no renovations that affected energy use.	Derived
GA	Electricity: Site kBtu	Energy characteristic	Number	Annual reported electricity use in Site kBtu. Calculated from the total annual use reported across all electricity meters, in the billing units provided, converted to kBtu.	Derived
GB	Electricity: Source kBtu	Energy characteristic	Number	Annual reported electricity use in Source kBtu. Calculated by multiplying the Electricity Site kBtu by 3.14, the source-site conversion factor for electricity.	Derived
GC	Electricity: Cost	Energy characteristic	Number	Annual reported electricity cost. Calculated from the total annual cost reported across all electricity meters.	Derived
GD	Natural Gas: Site kBtu	Energy characteristic	Number	Annual reported natural gas use in Site kBtu. Calculated from the total annual use reported across all natural gas meters, in the billing units provided, converted to kBtu.	Derived

Database Column	Field	Field Type	Data Type	Description	Source
GE	Natural Gas: Source kBtu	Energy characteristic	Number	Annual reported natural gas use in Source kBtu. Calculated by multiplying the Natural Gas Site kBtu by 1.05, the source-site conversion factor for natural gas.	Derived
GF	Natural Gas: Cost	Energy characteristic	Number	Annual reported natural gas cost. Calculated from the total annual cost reported across all natural gas meters.	Derived
GG	Fuel Oil: Site kBtu	Energy characteristic	Number	Annual reported fuel oil use in Site kBtu. Calculated from the total annual use reported across all fuel oil meters, in the billing units provided, converted to kBtu.	Derived
GH	Fuel Oil: Type	Energy characteristic	Number	Type of fuel oil. Indicated when selecting the fuel type for each energy meter. Allowable values: No.1, No.2, No. 4, No. 5 and No.6.	Derived
GI	Fuel Oil: Source kBtu	Energy characteristic	Number	Annual reported fuel oil use in Source kBtu. Calculated by multiplying the Fuel Oil Site kBtu by 1.01, the source-site conversion factor for fuel oil.	Derived
GJ	Fuel Oil: Cost	Energy characteristic	Number	Annual reported fuel oil cost. Calculated from the total annual cost reported across all fuel oil meters.	Derived
GK	District Steam: Site kBtu	Energy characteristic	Number	Annual reported district steam use in Site kBtu. Calculated from the total annual use reported across all district steam meters, in the billing units provided, converted to kBtu.	Derived
GL	District Steam: Source kBtu	Energy characteristic	Number	Annual reported district steam use in Source kBtu. Calculated by multiplying the District Steam Site kBtu by 1.20, the source-site conversion factor for district steam.	Derived
GM	District Steam: Cost	Energy characteristic	Number	Annual reported district steam cost. Calculated from the total annual cost reported across all district steam meters.	Derived
GN	Other: Site kBtu	Energy characteristic	Number	Annual reported other energy use in Site kBtu. Calculated from the total annual use reported across all other meters, in the billing units provided, converted to kBtu.	Derived
GO	Other: Source kBtu	Energy characteristic	Number	Annual reported other energy use in Source kBtu. Calculated by multiplying the Other Site kBtu by the source-site conversion factor for the applicable fuel.	Derived
GP	Other: Cost	Energy characteristic	Number	Annual reported other energy cost. Calculated from the total annual cost reported across all Other meters.	Derived
GQ	Total: Site kBtu	Energy characteristic	Number	Total Site kBtu summed across all fuel types.	Derived

Database Column	Field	Field Type	Data Type	Description	Source
GR	Total: Source kBtu	Energy characteristic	Number	Total Source kBtu summed across all fuel types.	Derived
GS	Total: Cost	Energy characteristic	Number	Total Cost summed across all fuel types.	Derived
GT	Site EUI	Energy characteristic	Number	Total Site kBtu divided by Total gross floor area.	Derived
GU	Source EUI	Energy characteristic	Number	Total Source kBtu divided by Total gross floor area.	Derived
GV	Site Energy/Unit (kBtu/Unit)	Energy characteristic	Number	Total Site kBtu divided by Number of Units. Calculated if unit information was provided.	Derived
GW	Source Energy/Unit (kBtu/Unit)	Energy characteristic	Number	Total Source kBtu divided by Number of Units. Calculated if unit information was provided.	Derived
GX	Energy Cost ($)/sq. ft.	Energy characteristic	Number	Total Cost divided by Total gross floor area.	Derived
GY	Energy Cost ($)/Unit	Energy characteristic	Number	Total Cost divided by Total Number of Units. Calculated if unit information was provided.	Derived
GZ	Indoor Use Meters: Gallons	Water characteristic	Number	Annual reported water use for Indoor Use meters in gallons. Calculated from the total annual use reported across all Indoor Use water meters (Types 01, 02, 03, and 04 in Appendix A), in the billing units provided, converted to gallons.	Derived
HA	Indoor Use Meters: Cost	Water characteristic	Number	Annual reported water cost for Indoor Use meters. Calculated from the total annual cost reported across all Indoor Use water meters (Types 01, 02, 03, and 04 in Appendix A).	Derived
HB	Outdoor Use Meters: Gallons	Water characteristic	Number	Annual reported water use for Outdoor Use meters in gallons. Calculated from the total annual use reported across all Outdoor Use water meters (Types 05, 06, 07, and 08 in Appendix A), in the billing units provided, converted to gallons.	Derived
HC	Outdoor Use Meters: Cost	Water characteristic	Number	Annual reported water cost for Outdoor Use meters. Calculated from the total annual cost reported across all Outdoor Use water meters (Types 05, 06, 07, and 08 in Appendix A).	Derived
HD	All Uses Meters: Gallons	Water characteristic	Number	Annual reported water use for All Uses meters in gallons. Calculated from the total annual use reported across all All Uses water meters (Types 09, 10, 11, and 12 in Appendix A), in the billing units provided, converted to gallons.	Derived

Database Column	Field	Field Type	Data Type	Description	Source
HE	All Uses Meters: Cost	Water characteristic	Number	Annual reported water cost for All Uses meters. Calculated from the total annual cost reported across all All Uses water meters (Types 09, 10, 11, and 12 in Appendix A).	Derived
HF	Total Water Use (Gal)	Water characteristic	Number	Total Water Use summed across all water meters.	Derived
HG	Total Water Use Intensity (gal/sq. ft.)	Water characteristic	Number	Total Water Use divided by Total gross floor area.	Derived
HH	Total Water (gal/unit/day)	Water characteristic	Number	Total Water Use divided by Number of Units divided by 365 days per year.	Derived
HI	Total Water Cost	Water characteristic	Number	Total Water Cost summed across all water meters.	Derived
HJ	Water Cost ($/sq. ft.)	Water characteristic	Number	Total Water Cost divided by Total gross floor area.	Derived
HK	Water Cost ($/Unit)	Water characteristic	Number	Total Water Cost divided by Number of Units.	Derived
HL	Analyzed in ENERGY STAR Score for Multifamily	ENERGY STAR Score	Text: Y/N	Properties marked as 'Y' were analyzed and included in the model to create the ENERGY STAR Score for Multifamily Properties.	Referenced
HM	Survey Weights for ENERGY STAR Score Analysis	ENERGY STAR Score	Number	Weighted values for properties that were analyzed and included in the model to create the ENERGY STAR Score for multifamily properties. Survey weights were constructed by EPA to account for stratification in the survey sample, and were based on the region and number of units. More information is available in the Technical Reference: ENERGY STAR Score for Multifamily Housing.	Referenced

VIII.   Appendix A: Definitions

This section provides definitions for terms used in the Survey documents.   These definitions can also be found in the Survey Instructional Booklet that accompanied the original 2012 Survey.

Property Types

- **Rental:** A building with more than four units in which tenants make a monthly payment and have no title to the unit where they reside.

- **Cooperative or Co-op:** A residential or mixed-use building wherein a corporation or trust holds title to a group of housing units and the common areas for the use of all the residents. The individual participants own a share in the cooperative which entitles them to occupy an apartment as if they were owners, to have equal access to the common areas, and to vote for members of the Board of Directors which manages the cooperative.

- **Condo:** A building with a form of property ownership where the purchaser receives title to a unit in a multi-unit building and a proportionate share in common areas.

Resident Populations

- **No majority population/general purpose housing:** The property is not inhabited by any dedicated population. This includes properties that are primarily occupied by single individuals and families.

- **Military Housing:** A multifamily rental property in which the units are occupied by persons serving in or employed by the military or that is located in an area where military and military related employment accounts for 20 percent or greater of the local employment base.

- **Student Housing:** A multifamily rental property in which the units are leased to undergraduate and/or graduate students.

- **Senior/Independent Living Housing:** Rental properties restricted to the elderly that also provide limited programs of assistance with domestic activities (meals, housekeeping, activities, transportation, etc.). Typically, a unit in an Independent Living Community resembles a standard market unit. Independent Living Communities generally are not licensed and generally do not provide assistance with Activities of Daily Living (ADLs) or healthcare. Activities of Daily Living (ADLs) are services provided in connection with the management of medications and assistance with bathing, dressing, toileting, ambulating, eating, and other similar activities.

- **Special Accessibility Needs:** Residents living in the property are covered by the American Disabilities Act.

Floor Areas

- **Gross internal floor area:** Measured between the principal exterior surfaces of the enclosing fixed walls of all buildings. Include all common area spaces, residential tenant units, and basements (livable and non- livable by tenants), and also rentable square footage of retail and commercial spaces. If numbers were not readily available, respondents were guided to consult building drawings and blue prints, use a measuring wheel to measure units, and add the rentable square footage and common area square footage.

- **Common area spaces:** Includes engineering rooms, utility closets, hallways, stairways, connecting corridors between buildings, community rooms, staff offices, lobbies, atria, entryways, cafeterias, kitchens in shared recreation/community rooms, storage areas, elevator shafts, indoor pools, fitness rooms, lounges, and enclosed tennis courts. Does not include any floor space that is located within any occupied or unoccupied apartment, or retail/commercial spaces.

- **Retail and commercial space:** Sum of the retail and commercial tenant space in the building(s) on a property.

Parking Areas

For all parking area questions, respondents were instructed to not include floor area estimates. Respondents were guided to verify parking floor area by obtaining information from building blue prints, resurfacing project reports, using a measuring wheel, or by counting parking spaces and accounting for driving lanes. Estimating based on aerial photographs, such as from Google Earth, was not recommended.

- **Open parking:** An area without a solid roof, walls and ventilation. Open parking does include partially enclosed spaces such as a surface lot with sun shades or tin roofing with a light.

- **Non-enclosed parking:** An area with an overhead covering but no walls and no ventilation requirements. It includes a multilevel parking structure that requires light during daytime hours.

- **Enclosed parking:** An area with an overhead covering, walls and ventilation requirements. This is typically an underground garage. "Tuck under" parking is considered fully enclosed.

Building Types

- **High-rise building:** A single structure of ten or more stories containing five or more separate dwelling units.

- **Mid-rise building:** A single structure of five to nine stories containing five or more separate dwelling units.

- **Low-rise building:** A single structure of one to four stories containing five or more separate dwelling units.

- **Garden:** One structure of one to four stories containing five or more separate dwelling units that is part of a group of buildings that surround at least one lawn or courtyard.

- **Towngarden:** One structure in a series of attached structures, each of which contain one to four stories and one to four separate dwelling units, that is part of a group of buildings that surround at least one lawn or courtyard.

- **Townhouse:** One structure in a series of attached structures, each of which contain one to four stories and one to four separate dwelling units.

- **Single family home:** An individual, detached structure of one to four stories containing one to four separate dwelling units.

Water Use Types

- **01** Municipally Supplied Potable Water – Indoor Use
- **02** Municipally Supplied Reclaimed Water – Indoor Use
- **03** Alternative Water Generated On-Site – Indoor Use
- **04** Other – Indoor Use
- **05** Municipally Supplied Potable Water – Outdoor Use
- **06** Municipally Supplied Reclaimed Water – Outdoor Use
- **07** Alternative Water Generated On-Site – Outdoor Use
- **08** Other – Outdoor Use
- **09** Municipally Supplied Potable Water – All Uses
- **10** Municipally Supplied Reclaimed Water – All Uses
- **11** Alternative Water Generated On-Site – All Uses
- **12** Other – All Uses