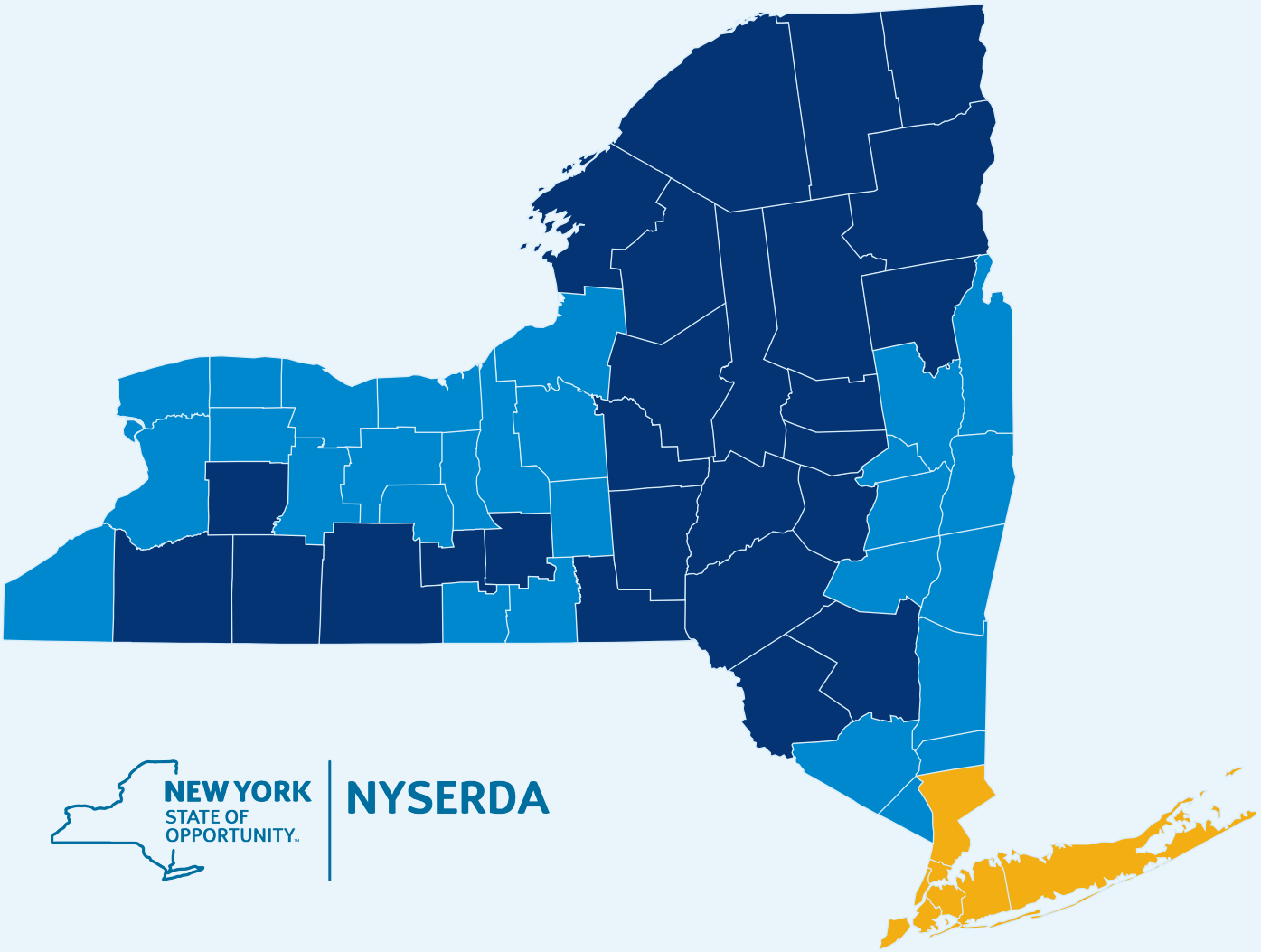


NEW YORK STATE OF OPPORTUNITY. | NYSERDA

2019 SINGLE-FAMILY BUILDING ASSESSMENT

RESIDENTIAL BUILDING STOCK ASSESSMENT

2019 SINGLE-FAMILY BUILDING ASSESSMENT
RESIDENTIAL BUILDING STOCK ASSESSMENT

PREPARED FOR:

New York State Energy Research And Development Authority
Albany, New York

Carley Murray
Senior Project Manager

Patricia Gonzales
Senior Project Manager

PREPARED BY:

Cadmus Group LLC
Waltham, Massachusetts

Mitt Jones
Associate

John Walczyk
Senior Associate

Steve Cofer
Principal

Shannon Greene
Analyst

Bonnie Powell
Analyst

Kristie Rupper
Associate

Andrew Rietz
Associate

NYSERDA CONTRACT 129931 | OCTOBER 2019

Letter from NYSERDA Senior Vice President

NYSERDA is pleased to present this Residential Building Stock Assessment, an update to the Residential Statewide Baseline Study released in July 2015. This update provides insight into single-family home structures across the State, including energy use and energy efficiency. Detailed data collected and summarized through this study includes home size, systems used for heating and cooling, and other home features such as lighting, electronics, and appliances.

Under Governor Andrew M. Cuomo's leadership, New York State has enacted the historic Climate Leadership and Community Protection Act (CLCPA), which promotes energy efficiency and includes nation-leading targets to reduce greenhouse gas emissions and put New York on a path toward achieving a carbon-free electricity system by 2040.

The snapshot created by this report puts the CLCPA into perspective by helping us recognize the current status of our single-family housing stock and the progress we've made in energy efficiency as well as how far we still need to go to achieve a carbon-neutral building stock by mid century.

This report is designed to provide you, as an industry stakeholder, with data to inform your work. The information here is also available online on OpenNY at data.ny.gov and at nyserda.ny.gov.

I encourage you to continue to help us move toward New York State's clean energy future and take advantage of these tremendous resources.

Sincerely,

Janet Josept
Senior Vice President, NYSERDA

NEW YORK STATE OF OPPORTUNITY. | NYSERDA

NOTICE

This report was prepared by Cadmus in the course of performing work contracted for and sponsored by the New York State Energy Research and Development Authority (hereafter "NYSERDA"). The opinions expressed in this report do not necessarily reflect those of NYSERDA or the State of New York, and reference to any specific product, service, process, or method does not constitute an implied or expressed recommendation or endorsement of it. Further, NYSERDA, the State of New York, and the contractor make no warranties or representations, expressed or implied, as to the fitness for particular purpose or merchantability of any product, apparatus, or service, or the usefulness, completeness, or accuracy of any processes, methods, or other information contained, described, disclosed, or referred to in this report. NYSERDA, the State of New York, and the contractor make no representation that the use of any product, apparatus, process, method, or other information will not infringe privately owned rights and will assume no liability for any loss, injury, or damage resulting from, or occurring in connection with, the use of information contained, described, disclosed, or referred to in this report.

NYSERDA makes every effort to provide accurate information about copyright owners and related matters in the reports we publish. Contractors are responsible for determining and satisfying copyright or other use restrictions regarding the content of reports that they write, in compliance with NYSERDA's policies and federal law. If you are the copyright owner and believe a NYSERDA report has not properly attributed your work to you or has used it without permission, please email print@nyserda.ny.gov

Information contained in this document, such as web page addresses, are current at the time of publication.

ACKNOWLEDGEMENTS

The Cadmus project team would like to express sincere gratitude and appreciation for NYSERDA Senior Project Manager Carley Murray, whose thoughtful and incisive leadership provided essential support and guidance throughout the project.

We also thank members of the broader NYSERDA project team, including Jennifer Meissner, Victoria Engel-Fowles, and Patricia Gonzales, all of whom provided leadership and guidance critical to the success of the project.

Performance Systems Development (PSD) played an invaluable role in facilitating the rapid ramp up and deployment of field staff necessary for successful completion of the project. We would especially like to thank Kathy Greely for her leadership of the PSD project team, Ethan MacCormick for his technology wizardry, and Dave Abrey for his seasoned field leadership.

Cadmus would also like to thank the project team at Honeywell, which provided crucial recruiting and field staff capabilities, including project team lead Mike Lyons and field manager Nathan Yehle.

Finally, Cadmus expresses whole-hearted appreciation for the field staff who completed the 456 site visits during a two-month period. This report would not be possible without their contributions.

ACRONYMS AND ABBREVIATIONS

AC	Air conditioning
ACH50	Air changes per hour at 50 Pascals
BPI	Building Performance Institute
CCFL	Cold cathode fluorescent light
CEER	Combined Energy Efficiency Ratio
CFL	Compact fluorescent light
CFM50	Cubic feet per minute at 50 Pascals
CRT	Cathode ray tube
DVD	Digital Versatile Disc
EDR	Economic Development Region
EER	Energy Efficiency Ratio
EF	Energy Factor
HERS	Home Energy Rating System
HSPF	Heating Seasonal Performance Factor
HVAC	Heating, ventilation, and air conditioning
LCD	Liquid crystal display
LED	Light emitting diode
NYSERDA	New York State Energy Research and Development Authority
OLED	Organic LED
PSD	Performance Systems Development
RBSA	Residential Building Stock Assessment
RESNET	Residential Energy Services Network
RSBS	Residential Statewide Baseline Study
SEER	Seasonal Energy Efficiency Ratio

TABLE OF CONTENTS

EXECUTIVE SUMMARY

KEY FINDINGS

The NYSERDA 2019 *Residential Building Stock Assessment* (RBSA) provides the first update to the 2015 *Residential Statewide Baseline Study* (RSBS) of New York State, to characterize the estimated 5.3 million single-family homes throughout the State. Like the 2015 RSBS, the RBSA collected data about New York homes through two primary means—web and telephone surveys and site visits.

This report presents a high-level overview of findings from the surveys and site visits conducted for the 2019 RBSA. Appendix A provides more-detailed results across all collected home characteristics in roughly 250 tables. A total of 2,419 participants completed the web and telephone survey statewide. Under the leadership of Cadmus as prime contractor, field staff working with subcontractors PSD and Honeywell completed site visits at 456 single-family homes, which comprised new and existing homes sampled within each of the State's 10 Economic Development Regions (EDRs).

The project also encompassed two additional components—an HVAC market assessment to inform updating baseline conditions for high-efficiency heating equipment in the State, and a potential study, which estimated three-, five-, and 10-year energy efficiency potential in the State. Documenting the results of these two additional components falls outside of the scope of this report, which presents findings solely for the building assessment component. Separate reports are available for the HVAC market assessment and potential study components.

The primary objectives of the RBSA are to provide a profile of new and existing homes in the State based on data from a representative sample of homes and to determine changes in building and equipment stock since the 2015 RSBS, including changes in the saturation of energy-consuming equipment (electric, natural gas, and other fuels), building characteristics, and energy management practices. The RBSA also collected customer household and demographic information.

Information provided by this study will be used by NYSERDA, the New York State Department of Public Service, energy efficiency program administrators throughout the State, and other interested parties for a variety of purposes, such as informing program planning and setting baselines for savings calculations. This information also provided necessary inputs to the HVAC market assessment and potential study components of the study.

The following section highlights several key findings from the NYSERDA RBSA study. Some of these findings represent select statistically significant differences relative to the 2015 RSBS; other findings stand out as notable because of other considerations, such as indicating significant potential for savings. All results are weighted to provide estimates representative of single-family homes throughout the State. This study defines single-family homes as any house or living unit in a building with one to four living units. Many tables present findings by Climate Zones 4, 5, and 6, as defined in the 2015 International Energy Conservation Code. The study presents some findings by existing and new homes, with new homes defined as single-family homes constructed in 2015 or after. Throughout this report, findings not indicated as being specific either to existing homes or new homes apply to the total population of single-family homes within a given geographic area. Except where presented by climate zone, findings apply to the statewide population of single-family homes.

More Homes Use Air Conditioning

90% of homes statewide use air conditioning (AC), up from 85% in the 2015 RSBS.

	Central AC	Room or Window AC	Heat Pump	No AC
2015 RSBS	35%	48%	2%	15%
2019 RBSA	45%▲	40%▼	5%▲	10%▼

SEE HEATING AND COOLING

Fewer Homes Primarily Heat with Fuel Oil

Primary heating with fuel oil dropped from 25% to 19% statewide.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Statewide
2015 RSBS	38%	13%	23%	25%
2019 RBSA	26%▼	10%▼	20%	19%▼

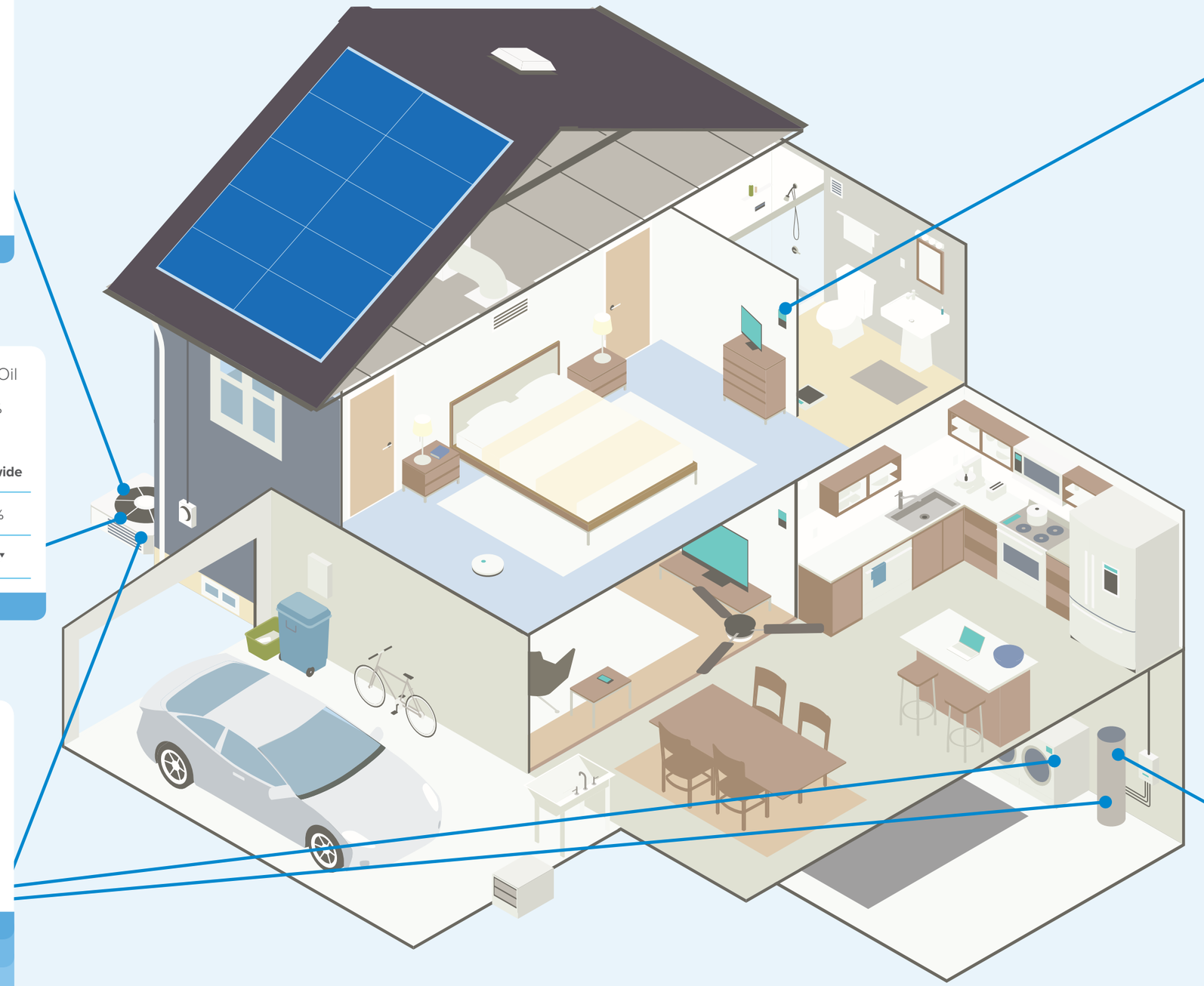
SEE HEATING AND COOLING

Natural Gas Gained Share

RBSA data show significant increases in natural gas across end uses.

	Primary Heating	Water Heating	Clothes Dryer
2015 RSBS	55%	54%	32%
2019 RBSA	65%▲	67%▲	43%▲

SEE HEATING AND COOLING
SEE WATER HEATING
SEE APPLIANCES



Smart Thermostats Get Traction

11% of homes with central heating or cooling use a smart thermostat.

Thermostat Type	Statewide
Smart	11%
Manual	23%▼
Programmable	66%

SEE HEATING AND COOLING

Water Heater Efficiency Standards

Assuming same-size replacement, only 7% of water heaters statewide must achieve the highest energy efficiency ratings under federal standards.

Water Heater Size	Statewide
55 gallons or smaller	93%
More than 55 gallons	7%

SEE WATER HEATING

Air Sealing Potential

Blower door testing shows room for improvement statewide in air leakage.

	Existing Homes	New Homes
Air changes per hour at 50 Pascals	12.1	4.0

SEE BUILDING SHELL

Lighting Transformation Continues

LED bulbs now far outnumber CFLs, and inefficient bulbs have dramatically declined.

Inefficient	37%▼
LED	34%
CFL	18%
Linear Fluorescent	8%
Other	2%

SEE LIGHTING

Second Refrigerators are Common

One in four homes statewide has a second full-size refrigerator.

Number	Full-Size Refrigerators
1	71%
2	25%
3	3%

SEE APPLIANCES

Program Awareness and Participation

Knowledge remains key. More than 50% of program nonparticipants said they did not know of any energy efficiency programs.

2015 RSBS	2019 RBSA	2015 RSBS	2019 RBSA
51%	53%	15%	30%▲
Am not aware of any		Do not know who to contact	

SEE ENERGY EFFICIENCY PROGRAM AWARENESS AND PARTICIPATION

Mostly LED Televisions

LEDs make up more than half of all televisions, a significant increase from 2015.

Television Type	2015 RSBS	2019 RBSA
LED	35%	51%▲
LCD	35%	36%
CRT	26%	6%▼

SEE ELECTRONICS

STUDY OVERVIEW

ABOUT THIS REPORT

This report presents findings of the building assessment component of the 2019 RBSA, which consisted of web or telephone interviews with 2,419 respondents throughout the State and site visits to 456 single-family homes. While the body of this report focuses on the most notable or significant findings, Appendix A provides a lengthy collection of tables, including updated versions of nearly all tables provided in the 2015 RSBS. Appendix B provides a detailed record of the study methodology for readers who want more detail than provided in the following pages.

GUIDING PRINCIPLES

As with the 2015 RSBS, providing results representative of homes throughout the State was a key priority. Retaining the ability to compare results against those of the 2015 RSBS was also essential. Finally, to provide results soon enough to inform NYSERDA's contributions to State policy processes, all data collection had to be complete in fall 2018, in less than four months after project kickoff. These requirements led to three decisions:

- The 2019 RBSA sampled by EDR to ensure that homes were sampled throughout the State and to provide stratified sampling similar to that of the 2015 RSBS.
- As with the 2015 RSBS, the RBSA also included separate stratified samples for new and existing homes across the 10 EDRs.
- The 2019 RBSA leveraged data collection methods and tools used in the 2015 RSBS as practical, though the team improved the tools to overcome some previous limitations and to adapt to current trends and priorities.
- The 2019 RBSA recruited participants primarily by mailing postcards to homes sampled from New York State Department of Taxation and Finance tax assessment rolls, instead of recruiting from a list of customers provided by investor-owned utilities (as with the 2015 RSBS).

SAMPLE DESIGN

Cadmus developed a sampling plan with the goal of achieving 90% confidence and ±10% precision for most parameters of interest at the State level and 90% confidence and ±20% precision within each of the 10 EDRs, shown in Figure 1. Based on coefficients of variation for key metrics calculated from the 2015 RSBS data, Cadmus designed a nested approach that involved surveying approximately 2,400 households and visiting 486 homes to collect detailed information from 120 new homes and 366 existing homes.

FIGURE 1. NEW YORK STATE ECONOMIC DEVELOPMENT REGIONS

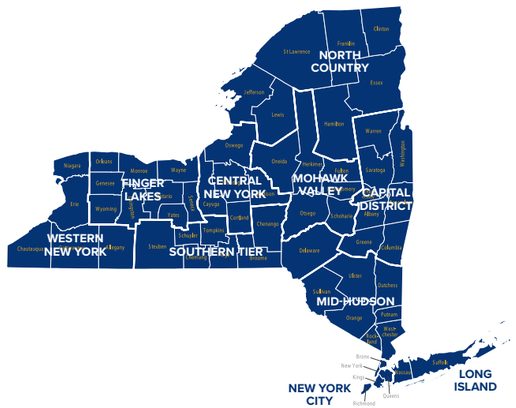


Table 1 illustrates the target site visit completions for each home vintage within each EDR.

TABLE 1. TARGET SITE VISIT SAMPLE SIZES

ECONOMIC DEVELOPMENT REGION	EXISTING HOMES	NEW HOMES	TOTAL
Capital District	32	16	48
Central New York	57	8	65
Finger Lakes	42	18	60
Long Island	30	10	40
Mid-Hudson	23	18	41
Mohawk Valley	26	5	31
New York City	60	13	73
North Country	20	13	33
Southern Tier	26	5	31
Western New York	50	14	64
Total	**366**	**120**	**486**

SAMPLE FRAME

Unlike the 2015 RSBS, the 2019 RBSA did not use customer information provided by investor-owned utilities to recruit for the study, largely because the project timeline did not allow enough time to request and receive customer information. Instead, Cadmus constructed the study sample frame by randomly selecting single-family homes from New York State Department of Taxation and Finance tax assessment rolls. Where necessary, such as for new homes (homes built in 2015 or later) in most areas, Cadmus purchased qualified mailing lists from a third party—Dynata (formerly Research Now SSI).

RECRUITING

With the nested design employed by the RBSA (and the 2015 RSBS before it), the study first recruited participants to complete an extensive survey, which collected a variety of data essential to characterizing single-family homes, including the size and type of the home, characteristics of space and water heating equipment, information about major appliances, and data on many other end-use equipment. The survey also asked respondents whether they would be interesting in participating in a site visit, and respondents who said yes made up the sample frame for recruiting site visit participants. The RBSA provided an incentive of $20 to participants who completed the survey, which required an average of 33 minutes to complete, and $100 to participants who completed a site visit. On average, site visits took 2.6 hours to complete.

The study did not set a formal target for survey completes, but Cadmus estimated that 2,423 respondents would be required to achieve the site visit goals if approximately 20% of survey respondents would go on to complete a site visit. A total of 2,419 participants completed the survey before it was closed on November 30, 2018.

To recruit survey recipients, the study mailed postcards to randomly selected homes within each EDR in sufficient numbers to reach the site visit goals, where practical.

An unexpectedly large number of postcards were needed to recruit the required number of survey completions: the study mailed 138,281 postcards (in addition to an email blast to 3,994 recipients). A relatively small number of survey

participants—197 of 2,419—opted to complete the survey by phone, despite rigorous call attempts to postcard recipients who had not responded. Appendix B of this report provides a detailed breakout of survey disposition, including total calls and call outcome by EDR.

As study team members responsible for completing site visits, Honeywell and PSD each handled recruiting and scheduling site visit participants from the group of survey respondents who expressed a willingness to participate. EDRs were divided among the two companies to avoid confusion during recruiting and to allow each company to realize efficiencies by focusing on a smaller geographic area.

The recruiting process led to the completion of site visits in 361 existing homes and 95 new homes during the 10 weeks provided for primary data collection. The study was able to meet targets for existing and new homes in most EDRs but, as with the 2015 RSBS, new homes in New York City and Long Island proved especially challenging, largely because of difficulty identifying new homes in those locations. Table 2 shows site visit completions by EDR and home vintage.

TABLE 2. SITE VISIT COMPLETIONS BY ECONOMIC DEVELOPMENT REGION AND HOME VINTAGE

ECONOMIC DEVELOPMENT REGION	EXISTING HOMES	NEW HOMES	TOTAL
Capital District	32	16	48
Central New York	57	7	64
Finger Lakes	44	18	62
Long Island	30	3	33
Mid-Hudson	23	18	41
Mohawk Valley	27	5	32
New York City	53	2	55
North Country	19	10	29
Southern Tier	26	2	28
Western New York	50	14	64
Total	**361**	**95**	**456**

CLIMATE ZONES

Consistent with the 2015 RSBS, for the purpose of analyzing and presenting results, the RBSA grouped survey and site visit participants into Climate Zones 4, 5, and 6 (shown in Figure 2), as defined in the 2015 International Energy Conservation Code. Table 3 shows the counties included within each Climate Zone.

FIGURE 2. NEW YORK STATE CLIMATE ZONES

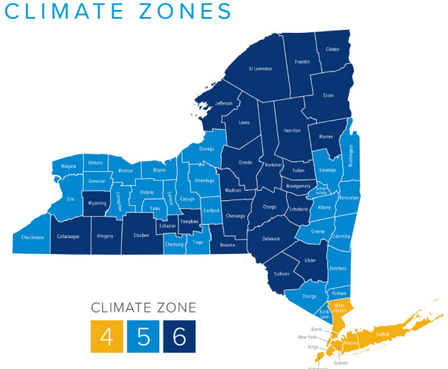


TABLE 3. NEW YORK STATE CLIMATE ZONE BY COUNTY

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	Oswego	Seneca
Chemung	Livingston	Orleans	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	

Table 4 shows survey and site visit completes for new and existing homes within each climate zone.

TABLE 4. SURVEY AND SITE VISIT COMPLETES BY HOME VINTAGE AND CLIMATE ZONE

CLIMATE ZONE	SURVEY COMPLETES		SITE VISIT COMPLETES	
	EXISTING HOMES	NEW HOMES	EXISTING HOMES	NEW HOMES
Climate Zone 4	515	38	85	5
Climate Zone 5	913	420	206	68
Climate Zone 6	407	126	70	22
Total	**1,835**	**584**	**361**	**95**

SURVEY

The RBSA web and phone survey collected data from September 28, 2018 through December 3, 2018, and allowed participation by telephone or web. To allow for comparisons with the 2015 RSBS results, the RBSA survey used most of the same questions verbatim. However, the RBSA survey did add numerous questions and, through a feedback process with NYSERDA, adjusted language in some cases to improve survey performance.

Additional questions for the 2019 RBSA collected information about several characteristics:

- Connected devices
- Smart thermostats
- Number of ductless mini-split heat pumps installed
- Supplemental heating systems
- Willingness to pay at various levels for high-efficiency equipment
- Utility bill payment and assistance

ON-SITE DATA COLLECTION

The study conducted all site visits between October 10 and December 15, 2018, after a two-day in-person training for Honeywell and PSD project field staff. Under the direction of NYSERDA and Cadmus, PSD managed completion of all new home site visits through contracted Home Energy Rating System (HERS) Raters. PSD also managed completion of 170 existing home site visits, and Honeywell staff completed 191 existing home site visits.

Site data were collected with an iPad data collection tool developed by PSD and based on the tool PSD developed for the 2015 RSBS. For the 2019 RBSA, PSD implemented several

improvements, including an automated check that ensured all required information had been entered before the field technician could complete data submission for a given home.

For the 2019 RBSA, site visit data collection stayed close to 2015 RSBS data scope and methods, including generating a HERS Index score for each new home and running blower door tests on all homes where allowed under Residential Energy Services Network (RESNET) and Building Performance Institute (BPI) standards. New data collected for the 2019 RBSA included information about several types of equipment:

- Connected devices
- Smart thermostats
- LED bulbs
- Extensive information about heat pump systems

The 2019 RBSA does not include data or findings regarding solar photovoltaic (PV) or electrical vehicle (EV) adoption. These data were collected for informational purposes. NYSERDA program data and utility interconnection data can provide close to a census of solar PV projects installed in the State, and Department of Motor Vehicles vehicle registration data can provide a precise count of EVs in use statewide.

LIMITATIONS

As noted in the Recruiting section above, the RBSA fell well short of meeting targets for new home site visits in the Long Island and New York City EDRs given the short timeline available for recruiting, the inherent challenges of targeting new homes in those areas, and the difficulty of recruiting during the highly active political campaigns of fall 2018. This resulted in a new homes sample size of only five for Climate Zone 4, which is not sufficient to be considered representative. To eliminate the possibility of Climate Zone 4 new homes values skewing other results, the study eliminated data for the five Climate Zone 4 new homes sites when calculating statewide results and Climate Zone 4 results that would otherwise represent both existing and new homes.

The accelerated timeline for the 2019 RBSA made some strategies used in the 2015 RSBS impractical, such as obtaining random samples of customers from utilities for outreach and recruiting, which provides higher-quality contact information than available through tax assessment data and purchased sample. In addition, for the 2015 study, NYSERDA mailed letters in advance to the utility customers to introduce the study and its importance and to let them know the study would be contacting them. The 2019 RBSA ultimately met data collection targets for most EDRs, but meeting targets within the short amount of time available for recruiting and fieldwork required a heavy reliance on mass mailing postcards.

As noted in some sections of this report, such as Water Heating, survey and site visit data collection sometimes provide much different results for the same home characteristic, such as type of water heater, though results are similar for most characteristics. Appendix A provides results for many characteristics from both survey and site visit data. Where results differ between survey and site visit data, Cadmus endeavored in this report to identify the more credible source using engineering judgement, common sense, informal benchmarking, and other information.

SUMMARY OF BUILDING AND EQUIPMENT CHARACTERISTICS

Each of the following sections summarizes notable findings for a given equipment category or building component. Findings are presented by climate zone, home vintage, and/or statewide, depending largely on the topic.

Where practical during analysis, Cadmus tested for statistically significant differences between results of the current study and the 2015 RSBS. Cadmus used two-sided t-tests for means and proportions to test the hypotheses that results for the 2019 RBSA for a given population of interest were equal or not equal to 2015 RSBS results. Cadmus identified metrics with significant differences when tests resulted in p-values of $p<0.01$; the report denotes these differences by ▲▼ symbols to indicate a value that is significantly higher or lower than in the 2015 RSBS results. We did not account for uncertainty of the 2015 RSBS results and treated them as fixed values.

To streamline presentation of results, this report represents only a high-level view of the collected and analyzed data. In most cases, Cadmus rounded values to whole numbers for better readability. In these instances, values may not sum exactly to 100%. Readers may select the SEE THE DATA button (presented throughout the report) to view more-detailed tables and additional tables in Appendix A. These tables represent a broader selection of data from the study and include sample sizes and error bounds.

SECTION 1

BUILDING CHARACTERISTICS AND DEMOGRAPHICS

The RBSA collected data on building characteristics and energy use through both surveys and site visits. Only the survey collected information about demographics, such as the number and age of occupants in the home, household income, and highest level of education attained. For data points collected through both data collection methods, each method has its advantage and drawbacks.

Conditioned floor area often correlates well with energy usage, but different definitions of the term lead to different numbers. In the RBSA web and telephone survey, questions regarding home size asked for the square feet of living space not including unfinished basements. In contrast, the conditioned floor area collected during site visits conformed to a RESNET definition, which provides somewhat nuanced direction regarding which spaces should be included. For example, a finished area should always be included in a RESNET conditioned floor area, whether heated or not, while unfinished areas should be included if sufficiently and directly heated.

Data collection also differed somewhat for energy usage between the survey and site visits. Whereas the survey simply asked for an estimate of the cost for each utility or type of fuel over the past year, site visits collected annual usage from bills provided by the participants. Scheduling and reminder calls with participants underscored the importance of making bills available. In contrast, the longer timeline and somewhat different recruiting methodology of the 2015 RSBS allowed energy usage to be provided from utility data for survey participants.

DEFINITIONS

All data collection included only single-family homes, which for this study were defined as buildings with one to four housing units. The study classified each home as one of four types: single-family detached home, single-family attached home, mobile or manufactured home, or apartment building or condominium. Single-family attached homes abut another structure on one or more sides.

The 2019 RBSA defines existing homes as any single-family home constructed before 2015. New homes are defined as any single-family home constructed in 2015 or after. The study classified homes as new or existing based primarily on construction dates provided in the State tax assessment data, where available.

The study generated a HERS rating for each new home. With the HERS Index, a score of 100 equates to the score of a standard new home, meaning one that does not exceed energy efficiency levels required by building codes. A home with a HERS rating of 70 is 30% more energy efficient than a standard new home, according to RESNET documentation.

EXISTING AND NEW HOMES PROFILES FROM SURVEY DATA

	EXISTING HOMES	NEW HOMES
Average HERS Rating (Site Visit)	N/A	55.7▼
Built Before 1940	25%	N/A
Less than 2,000 Sq Ft	59%▼	45%▲
Bedrooms	3.4▲	3.4
Single-Family Detached Homes	88%▲	84%▼
Own or Buying	97%▲	99%
Occupants	2.8	3.1
Annual Household Income of $75,000 or More	53%▲	57%▼
Highest Education Level of Graduate Degree	39%▲	48%

SEE THE DATA

KEY FINDINGS

SAMPLE COMPARISONS

Profile tables for existing and new homes depict somewhat different populations than the 2015 RSBS samples, though differences are typically minor. The 2019 RBSA existing homes sample appears generally representative when compared with data from other sources, such as the 2013–2017 American Community Survey.

SURVEY AND SITE VISIT SAMPLES

For existing homes, RBSA survey and site visit samples appear similar in size of home. With new homes, the site visit sample appears to skew somewhat to larger homes, but differences in the conditioned area definition in the survey and site visits may contribute.

NEW HOMES USE LESS

New homes appear to use less energy on average. The weighted average HERS rating dropped from 68.5 for the 2015 RSBS to 55.5 in the current study. As expected, 2019 RBSA data also show that new homes use less energy on average than existing homes.

AVERAGE NUMBER OF HOUSEHOLD MEMBERS BY AGE RANGE

Survey data depict a somewhat **older population in existing single-family homes** than the 2015 RSBS.

OCCUPANT AGES	EXISTING HOMES	NEW HOMES	STATEWIDE
Less than 5 Years	0.2▼	0.3	0.2▼
6 to 17 Years	0.4	0.5	0.4
18 to 24 Years	0.2	0. 1	0.2
25 to 34 Years	0.3▼	0.5	0.3▼
35 to 44 Years	0.3	0.5	0.3
45 to 54 Years	0.4	0.4	0.4
55 to 64 Years	0.5▲	0.4	0.5▲
65 Years or older	0.5▲	0.3	0.5▲
Total Household Members	2.8	3.1	2.8

SEE THE DATA

CONDITIONED FLOOR AREA FROM SURVEY AND SITE VISIT SAMPLES

Existing home size estimates from survey and site visits **appear similar**. Visited new homes were **somewhat larger**.

	EXISTING HOMES		NEW HOMES	
Area (Sq Ft)	SURVEY	SITE VISITS	SURVEY	SITE VISITS
Less than 1,000	5%▼	5%▼	2%	1%
1,000 to Less than 1,500	23%	20%	14%	11%
1,500 to Less than 2,000	30%	32%▲	30%	19%
2,000 to Less than 2,500	21%▲	17%	24%	10%▼
2,500 to Less than 3,000	11%▲	16%▲	15%	21%
3,000 to Less than 4,000	7%	8%	10%	24%
4,000 or More	2%▼	2%▼	6%	15%

SEE THE DATA

EXISTING HOMES ANNUAL ELECTRICITY USAGE FROM SITE VISIT DATA

Distribution of annual electricity usage **differs somewhat** for Climate Zone 4, primarily in the middle ranges.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
500 kWh or Less	6%	0%	2%	3%
501 to 2,500 kWh	3%▼	3%▼	3%▼	3%▼
2,501 to 6,000 kWh	24%	30%	30%	27%
6,001 to 12,000 kWh	55%▲	49%	41%	51%▲
12,001 to 20,000 kWh	11%	14%	17%	13%
20,001 kWh or More	1%	4%	6%	3%

SEE THE DATA

NEW HOMES ANNUAL ELECTRICITY USAGE FROM SITE VISIT DATA

New homes in Climate Zones 5 and 6 use the **most electricity per home**, but Climate Zone 4 results may not be representative.*

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
501 to 2,500 kWh	0%	12%	0%	8%
2,501 to 6,000 kWh	75%	17%	24%	19%
6,001 to 12,000 kWh	25%	30%	48%	35%
12,001 to 20,000 kWh	0%	28%	10%	23%
20,001 kWh or More	0%	3%	19%	8%

**New homes site visit results for Climate Zone 4 cannot be considered representative because of the small sample size. This limitation also influences statewide results.*

SEE THE DATA

SECTION 2

HEATING AND COOLING

The RBSA collected extensive data on heating and cooling in participants' homes. In the web and telephone survey, respondents reported the type, approximate age, and fuel type of primary heating and cooling equipment. The survey also collected information about thermostats, equipment maintenance, and supplemental heating and cooling systems, including fireplaces and heating stoves. Most of the high-level heating and cooling results discussed in this report are based on survey results because of the larger sample size they provide.

Data collected during the site visits provides the means to verify survey data and dive deeper into the equipment details. Field staff documented the locations of and detailed information about all heating, cooling, and ventilation equipment in each home. They also took pictures of all nameplates and recorded the make, model number, capacity, efficiency, and year of manufacture of equipment. Nameplates do not always include all data, so field technicians often conducted post-visit research of model numbers to determine the missing data.

If multiple systems were present, the field technician determined with the homeowner which system(s) provide the majority of heating and cooling. They also recorded the percentage of conditioned space served by each heating and cooling system. On-site data collection also included information about thermostats, including setpoints, setbacks, and whether participants used programs to control the heating or cooling.

CODE/STANDARDS CHANGES

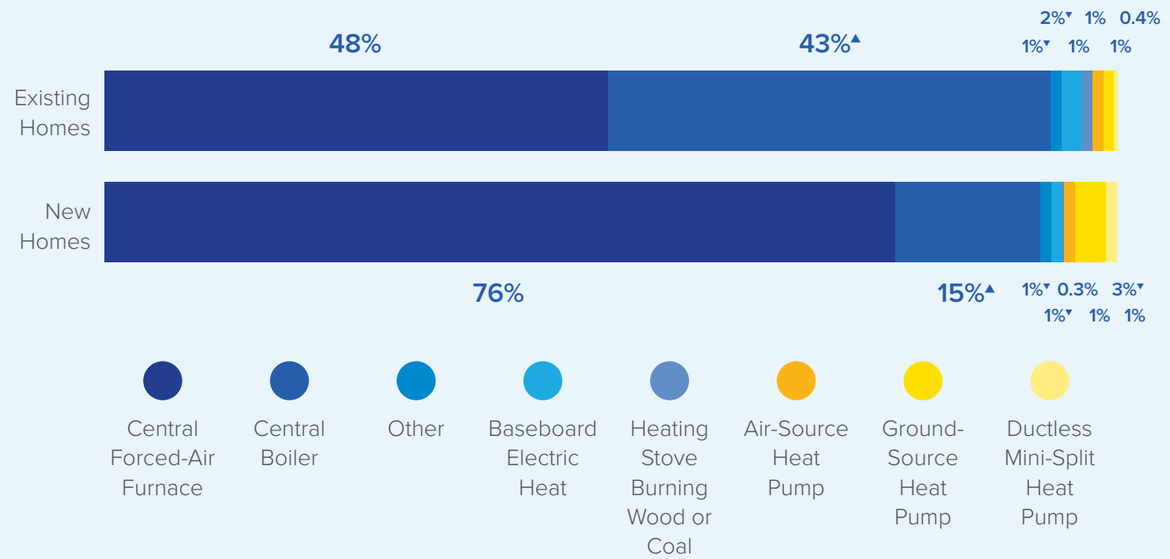
As of January 1, 2015, federal energy standards increased the minimum Seasonal Energy Efficiency Ratio (SEER) of central air source heat pumps from 13 to 14 and their minimum Heating Seasonal Performance Factor (HSPF) from 7.7 to 8.2.

The 2015 changes also used a new, additional definition for room air conditioner efficiency: the Combined Energy Efficiency Ratio (CEER) is similar to the Energy Efficiency Ratio (EER) but includes standby power. Manufactures must report both CEER and EER. Minimum CEER values range from 8.7 to 11.0 for 18 product classes, which vary primarily by cooling capacity the presence of louvered sides.

Federal renewable energy tax credits for ground-source heat pumps expired in 2017. Subsequently, after a period of uncertainty, tax credits were renewed for qualifying ground-source heat pumps through 2021, though tax credit levels step down by 4% each year.

PRIMARY HEATING EQUIPMENT BY HOME VINTAGE

Compared with existing homes, a **higher percentage of new homes use a forced-air furnace**, according to survey data.



SEE THE DATA

KEY FINDINGS

HEATING REMAINS MUCH THE SAME

The 2019 RBSA shows that a small percentage of homes now use ductless mini-split heat pumps for primary heating, and air source and ground source heat pumps retain a small share. Survey results show a higher percentage of central boiler systems and a lower percentage of electric baseboard heating than the 2015 RSBS, but methodological differences explain those apparent changes.

PRIMARY HEATING FUEL OIL SHARE HAS DECLINED

Natural gas remains the predominate statewide fuel type for primary heating and appears to have gained share, with an estimated 65% of single-family homes statewide using natural gas for primary heating. Fuel oil remains the second most common primary heating type, but its share decreased from 25% in the 2015 RSBS to 19%.

MORE HOMES USE AC

Survey data show that significantly more homes use air conditioning in every climate zone. The RBSA estimates that only 10% of existing homes and 7% of new homes have no AC equipment, compared with 15% and 11% in the 2015 RSBS. There also has been a significant shift in existing homes from window and room AC equipment to central AC and heat pumps.

SMART THERMOSTATS GAINED SHARE

Of homes with central heating or cooling systems, 11% statewide use a smart thermostat, in addition to the 66% using a programmable thermostat. Opportunity remains for both types of thermostats, particularly in Climate Zone 6, where 40% of homes use a manual thermostat.

SEE THE DATA

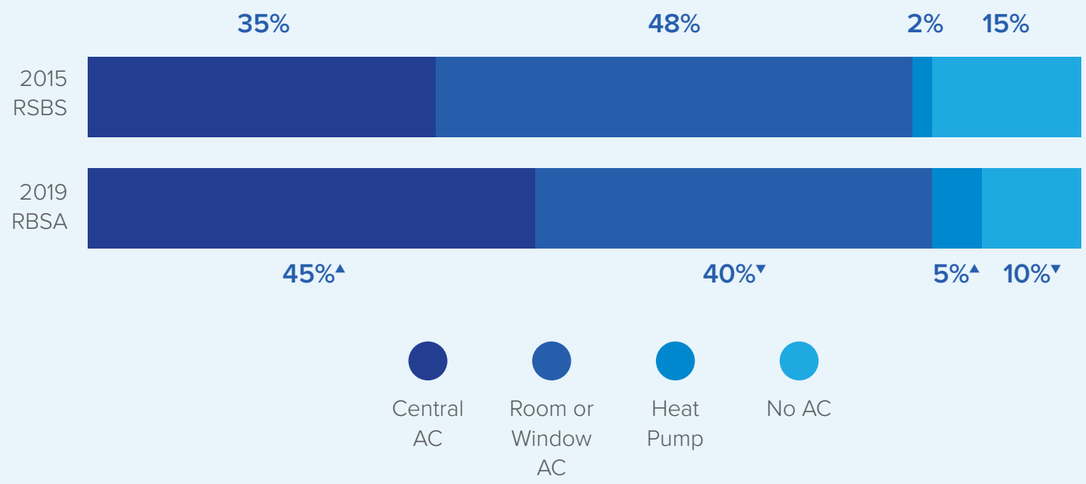
PRIMARY HEATING FUEL BY CLIMATE ZONE

Estimates based on survey data show **significantly higher natural gas use** for primary heating than in the 2015 RSBS.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Natural Gas	67%▲	72%▲	41%▲	65%▲
Fuel Oil	26%▼	10%▼	20%	19%▼
Electricity	4%	9%	13%▲	7%
Propane	0.2%▼	6%▼	13%	4%▼
Wood/Wood Pellets	0%	2%▼	8%▼	2%▼

CHANGES IN PRIMARY COOLING EQUIPMENT TYPES

Survey data show a **significant decrease in homes without AC**, along with an **increase in central AC and heat pump systems**.



SEE THE DATA

PRIMARY HEATING EQUIPMENT BY FUEL

Most primary heating systems using fuel oil **are not ducted**, making upgrades to central furnaces or heat pumps more costly.

	NATURAL GAS	OIL	ELECTRICITY	PROPANE
Central Forced-Air Furnace	59%	26%	33%	59%
Central Boiler	41%▲	72%▲	0%	36%▲
Baseboard Electric Heat	0%	0%	28%	0%
Air Source Heat Pump	0%	0%	17%▲	0%
Ground Source Heat Pump	0%	0%	11%▲	0%
Ductless Mini-Split Heat Pump	0%	0%	6%	0%

THERMOSTAT TYPE BY CLIMATE ZONE

Smart thermostats have captured **more than 10% of thermostat share statewide** among homes with central heating or cooling.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Smart	14%	10%	4%	11%
Manual	19%▼	23%▼	40%	23%▼
Programmable	67%	67%	56%	66%▲

SEE THE DATA

SECTION 3

WATER HEATING

Field technicians identified and characterized all water heaters in each home. Technicians recorded the water heater and fuel type, storage volume, energy factor (EF), recovery efficiency, tank insulation characteristics, pipe insulation characteristics, venting configuration and size, and yellow label (EnergyGuide) energy cost values. They also took pictures of the nameplate and recorded the make and model number and year of manufacture. Technicians recorded the general location of the water heater, specifying whether it was located in a conditioned or unconditioned space. Location information is especially noteworthy for heat pump water heaters, because it can affect both the performance of the water heater and the home heating and cooling load.

The web and telephone survey also collected basic information about water heating, though with mixed results. When compared with site visit data, the water heating fuel reported by survey participants appeared generally accurate. Survey data regarding water heater type appeared less reliable. For example, a surprisingly large percentage of survey recipients reported using a heat pump water heater, which proved inaccurate when compared with site visit data and other available information. Accordingly, results discussed here draw from survey data for water heating fuel, to leverage the larger sample size and allow for directional comparisons to the 2015 RSBS data, but rely on site visit data for water heater type.

CODE/STANDARDS CHANGES

In 2015, the National Appliance Energy Conservation Act raised the federal minimum efficiency for the most common types of storage water heaters. The new minimum EF value of 2.0 for electric residential water heaters with a storage volume more than 55 gallons effectively prohibits the sale of residential electric resistance water heaters of that size, because the EF of 2.0 can only be achieved by a heat pump water heater. For electric water heaters with storage volume less than 55 gallons, the minimum EF increased modestly to 0.95.

Similarly, the act requires a higher minimum EF for gas storage water heaters above 55 gallons. For example, the minimum EF for a 60-gallon gas-fired water heater increased from 0.56 to 0.75, which effectively requires a condensing design

WATER HEATER FUEL BY CLIMATE ZONE

Survey data show a **significant shift to natural gas water heating** in each climate zone.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Natural Gas	71%▲	72%▲	40%▲	67%▲
Electricity	7%	16%▼	32%▼	14%▼
Fuel Oil	21%▼	5%	10%	14%▼
Propane	0%▼	6%▼	15%	5%▼
Solar	0%	0%	0.8%	0%

SEE THE DATA

KEY FINDINGS

GAS WATER HEATING GAINS SHARE

Weighted survey results show a significant drop statewide in the percentage of single-family homes using electricity, fuel oil, and propane for water heating and a significant increase in natural gas water heater share. According to those data, 67% of single-family homes statewide use natural gas water heating, up from 54% in the 2015 RSBS, though it seems likely that some of that apparent shift results from methodological differences.

NEW HOMES ADOPT NEWER TECHNOLOGY

On-demand water heaters are much more common in new homes than in existing, with a share of about 26%. Heat pump water heaters and heating water with ground-source heat pumps are also more common in new homes, with estimated shares of 7% and 6%, respectively.

EFFICIENCY STANDARDS MAY HAVE LITTLE EFFECT

RBSA site visit data indicate that only 7% of all storage water heaters in the State have a capacity of greater than 55 gallons, leaving most households unaffected by the most stringent standards.

SEE THE DATA

WATER HEATER FUEL BY DATA SOURCE

Estimated fuel shares from site visit data **tracked closely with those from survey data**.

	NATURAL GAS	ELECTRICITY	FUEL OIL	PROPANE
SITE VISITS	69%	12%	15%	3%
SURVEY	67%▲	14%▼	14%▼	5%▼

WATER HEATER TYPE BY HOME VINTAGE

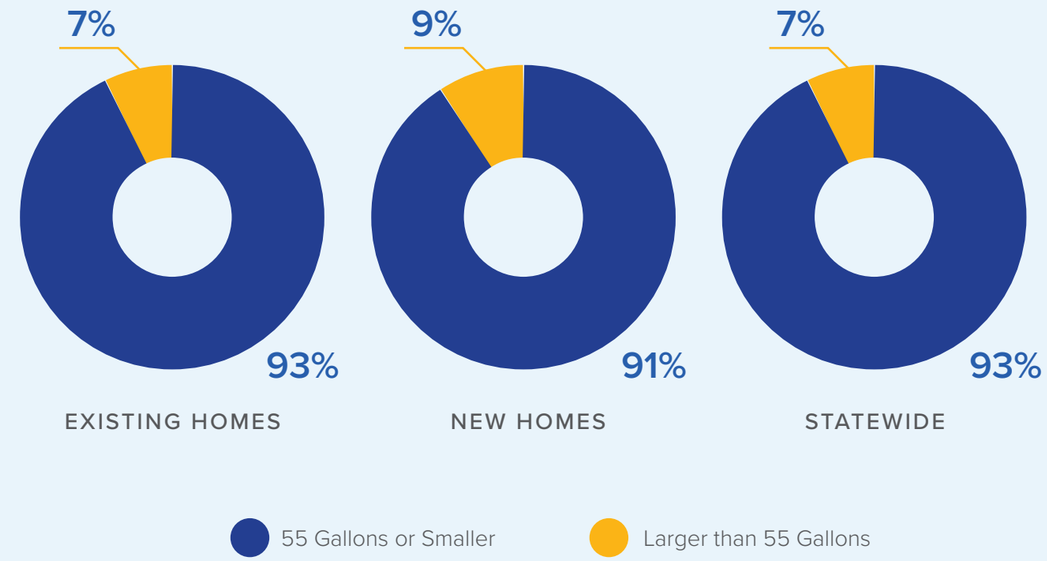
On-demand water heaters and heat pump variants have a **higher share in new homes** than in existing homes.

	EXISTING HOMES	NEW HOMES
Storage Tank Water Heater	75%	60%
Space Heating Boiler with Tank	14%	2%
Tankless/On-Demand	7%	25%
Space Heating Boiler with Coil	4%	0%
Heat Pump Water Heater	0.4%	7%
Ground Source Heat Pump with Tank	0.4%	6%

SEE THE DATA

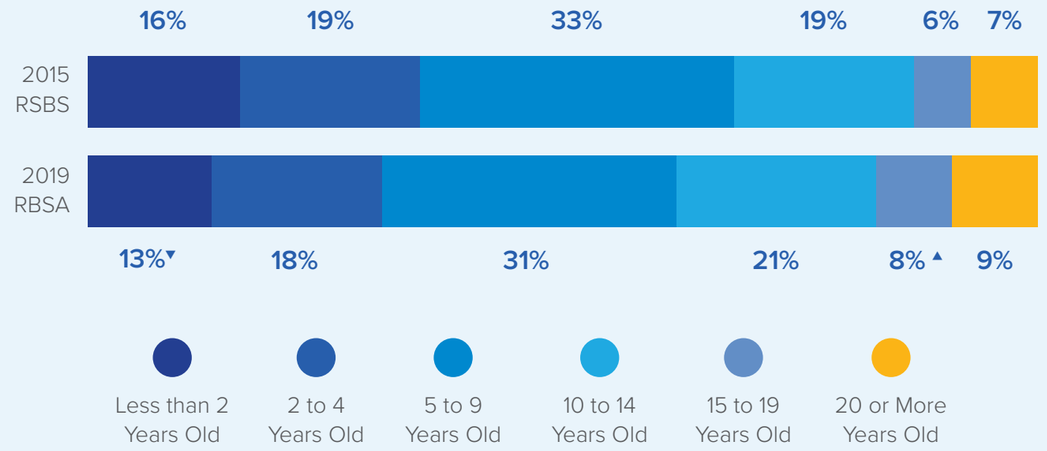
STORAGE WATER HEATER TANK SIZE

Storage water heaters larger than 55 gallons **must achieve much higher energy efficiency ratings** under federal standards.



WATER HEATER AGE

Based on survey data, **17% of water heaters** have reached the end of their estimated useful life of 15 years.



SECTION 4

BUILDING SHELL

The 2019 RBSA collected a variety of information about the building shell (or envelope) of each home during site visits, including the thickness and type of installed insulation in the ceilings, walls, foundation walls, and floors that make up the thermal boundary of the home. As with the 2015 RSBS, site visits also included a blower door test except where BPI or RESNET standards precluded such testing or where conditions would make it difficult to produce reliable results.

Blower door results included here show air leakage in air changes per hour at 50 Pascals (ACH50) and cubic feet per minute at 50 Pascals (CFM50), with 50 Pascals being the pressure used for the blower door test. Expressing air leakage in air changes per hour takes the size of the home into account to allow for more meaningful comparisons.

Consistent with the 2015 RSBS, surfaces characterized as foundation refer to the exterior walls of foundation spaces—namely basements and crawlspaces. Floors correspond to floors over outside or over unconditioned spaces such as garages or vented crawlspaces. Field staff also characterized floors over unconditioned basements, but in the great majority of cases these basements were arguably indirectly conditioned, and floors above them should not be considered the thermal boundary of the home.

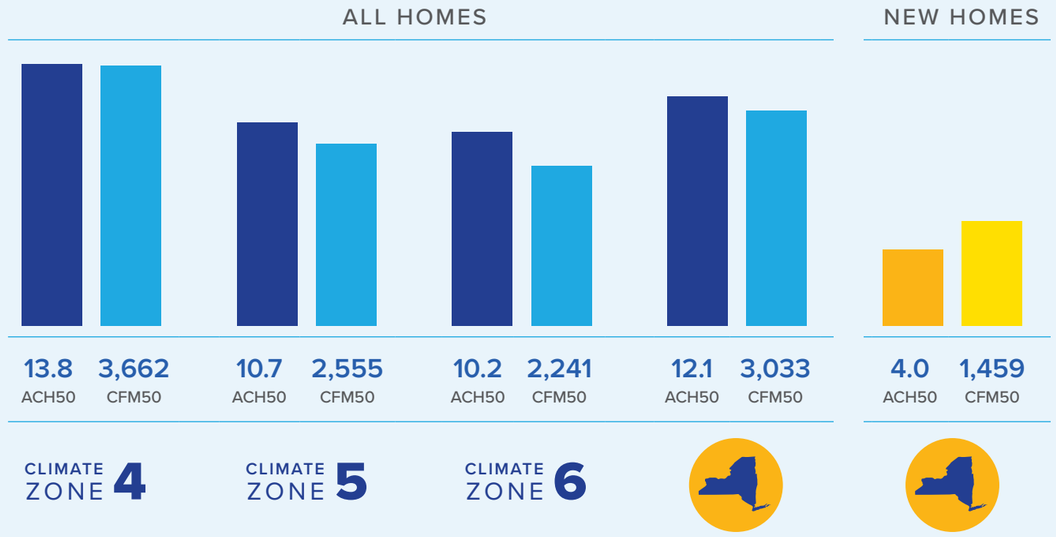
During site visits, field staff defined like areas of envelope surface, such as walls with the same apparent type and thickness of insulation, as one segment. The field technician also reported the percentage of the total surface of that type (walls, for example) made up by that segment. Tables that present results for these envelope surfaces use these percentage values for each segment when calculating distributions of characteristics such as insulation thickness. Sample size values reported in these tables correspond to the number of defined segments.

CODE/STANDARDS CHANGES

Building codes apply to existing homes only when portions of the home are being extensively remodeled or area is being added. New homes in the State outside of New York City are subject to codes such as the State Uniform Fire Prevention and Building Code (Uniform Code) and the State Energy Conservation Construction Code (Energy Code). Buildings in New York City are subject to the New York City Construction Code and New York City Energy Conservation Code. Both jurisdictions updated energy codes in 2016, with the State Energy Code incorporating the 2015 International Energy Conservation Code, with amendments.

BLOWER DOOR AIR TIGHTNESS

Blower door testing showed **significant potential** among existing homes.



SEE THE DATA

KEY FINDINGS

NEW HOMES LEAK LESS

Blower door testing shows much less air leakage in new homes than existing homes, with average ACH50 of 4.0. More than half of the homes tested appear to exceed the 3.0 ACH50 requirement imposed statewide by energy codes in 2016, though many of the new homes represented here began construction before those codes went into effect (and before blower door tests were required by code).

AIR SEALING POTENTIAL REMAINS

Blower door testing showed lower air leakage on average in Climate Zones 5 and 6 than Climate Zone 4, but potential remains throughout the State. Results estimate that just over 50% of homes statewide would test at ACH50 of 10.0 or more.

INSULATION OPPORTUNITIES EXIST

More than 65% of ceilings statewide have eight inches of insulation or less. Eight inches of insulation generally equates to an R-value of 20 to 30, well under the R-49 required in new homes or additions by current State code. Exterior walls, foundation walls, and floors over garages, vented crawlspaces, and outside also show room for improvement, with all having a significant percentage of uninsulated segments.

FEW SINGLE-PANE WINDOWS REMAIN

With a significant reduction in every climate zone relative to the 2015 RSBS, few single-pane windows without storm windows remain—only 3% by window area. Windows with single-pane glazing and with storm windows make up roughly 10% of windows by window area.

BLOWER DOOR AIR TIGHTNESS BY ACH50 RANGE AND CLIMATE ZONE FOR ALL HOMES

Climate Zones 5 and 6 show **lower ACH50** than Climate Zone 4 but still have room for improvement.

ACH50	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Less than 5	5%	15%	24%	12%
5 to Less than 10	32%	48%	30%	38%
10 to Less than 15	30%	20%	32%	27%
15 to Less than 20	20%	7%	8%	13%
More than 20	12%	11%	6%	11%
Mean	13.8	10.7	10.2	12.1

SEE THE DATA

PERCENTAGE OF SURFACES WITH NO INSULATION BY CLIMATE ZONE

All surface types show a **significant percentage of uninsulated segments**, though not all can feasibly be insulated.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Ceilings	11%▲	5%▲	0.1%	7%▲
Walls	29%	18%	9%	22%
Foundation Walls	58%▼	70%	71%	65%▼
Floors*	13%	30%	0%	17%

*Represents floors over garages, over outside areas, and over vented crawlspaces only.

SEE THE DATA

EXISTING HOMES CEILING INSULATION THICKNESS BY CLIMATE ZONE

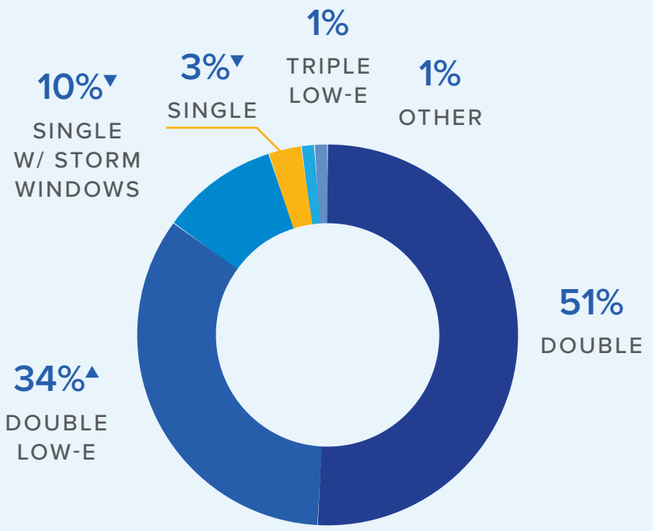
More than 65% of ceilings statewide have eight inches of insulation or less.

INCHES	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
0	11%▲	5%▲	0.1%	7%▲
1.0 to 3.0	14%	7%	5%	10%
3.5 to 5.0	13%	7%▼	5%▼	10%▼
5.5 to 8.0	43%	36%	36%	39%
9.0 to 12.0	14%	31%	34%	23%
13.0 to 16.0	3%	11%▲	15%	8%▲
17.0 to 20.0	1%	4%	2%	2%
21.0 to 24.0	0%	0%	3%	0.4%

SEE THE DATA

EXISTING HOMES WINDOW GLAZING

As little as **3% of single-pane windows** without storm windows remain statewide.



SEE THE DATA

SECTION 5

LIGHTING

For lighting data collection, field technicians recorded the quantity and type of bulbs for each room or space type, along with fixture and control type where controls went beyond simple on/off switches. Field technicians collected this data for lighting both inside and outside the home, including bulbs stored for future use.

Where necessary and reasonable, technicians removed lampshades or fixture covers to identify the bulb characteristics. When a given data point could not be identified by visual inspection, field technicians attempted to gather the information from another source, such as the homeowner, or noted that they were unable to identify the bulb type.

Identifying bulb type can be difficult due to accessibility or safety issues, and discerning halogen from incandescent bulbs can be especially challenging. Accordingly, data collected during site visits combined incandescent and halogen bulbs into one category labeled “inefficient.”

Although the RBSA captured data on CFL and LED bulbs separately, some lighting tables combine CFL and LED bulbs into one category to allow for direct comparisons with 2015 RSBS results.

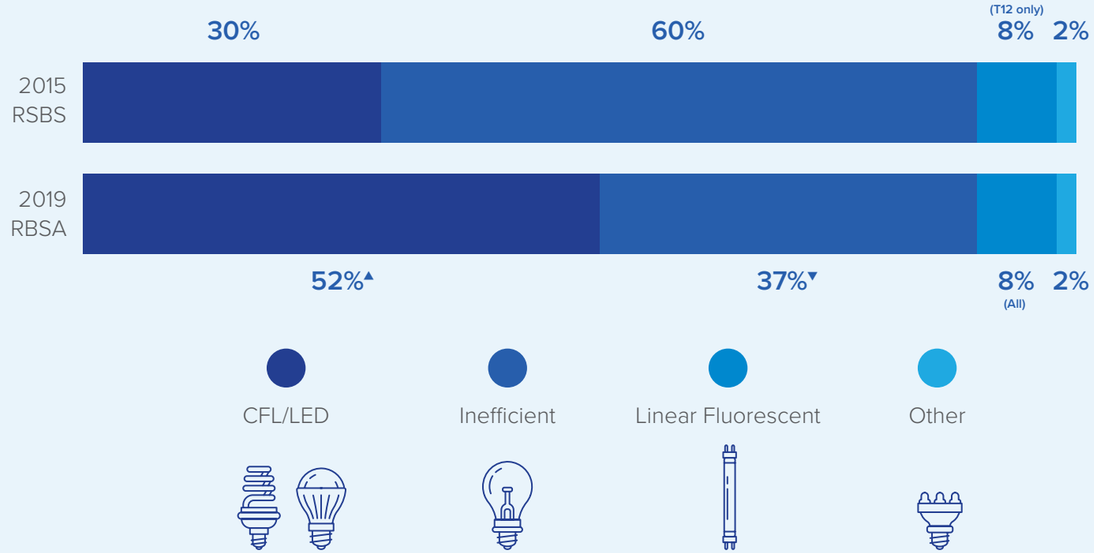
As with the 2015 RSBS, the web and telephone survey also collected information about bulbs, but only for those used two or more hours a day. Accordingly, the survey results cannot be directly compared with the site visit results, but they do allow for comparisons with the 2015 RSBS survey data.

CODE/STANDARDS CHANGES

The Energy Independence and Security Act of 2007 defined high-efficiency standards for common household lighting. These standards, which phased in between January 1, 2012 and January 1, 2014, likely played a large role in accelerating a shift away from incandescent bulbs. Many specialty bulbs using incandescent designs are still available, such as appliance lamps, three-way bulbs, and others. Additional federal lighting standards may go into effect in August 2021.

DISTRIBUTION OF BULB TYPE BY STUDY

Energy efficient lighting makes up **more than half of all bulbs installed in homes.**



SEE THE DATA

KEY FINDINGS

LEDS TAKE THE LEAD

LED has surpassed CFL as the high-efficiency bulb technology of choice. Site visit data found 34% LED bulbs on average statewide, compared with 18% CFLs.

EFFICIENT BULBS GAIN SHARE

LEDs and CFLs combined now account for 52% of installed bulbs statewide, up from 30% in the 2015 RSBS.

POTENTIAL REMAINS

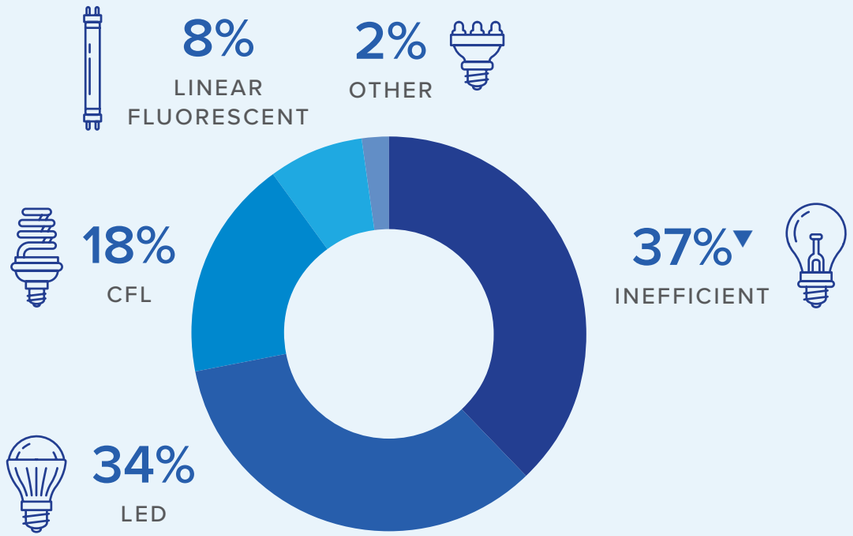
Despite the rapid transformation of the lighting market, opportunity remains. Site visit data show that inefficient lamps fill more than one-third of sockets, at 37% statewide, though this is down significantly from 60% in the 2015 RSBS.

NEW HOMES, OLD BULBS

New homes boast 78% efficient lighting overall, but site visit data show that 37% of bulbs in storage are inefficient bulbs, which could replace efficient bulbs in future years.

BULB TYPE STATEWIDE FROM SITE VISITS

LEDs represent one-third of all bulbs installed (34%), surpassing CFLs (18%).



SEE THE DATA

PERCENTAGE OF EFFICIENT LIGHTING IN NEW AND EXISTING HOMES

New homes have a **much higher percentage of efficient lighting** (78%) than existing homes (52%).

	INEFFICIENT	LED	CFL	LINEAR FLUORESCENT	OTHER
EXISTING HOMES	37%▼	34%	18%	9%	2%
NEW HOMES	16%▼	62%	16%	2%	3%

SEE THE DATA

BULBS IN STORAGE BY HOME VINTAGE

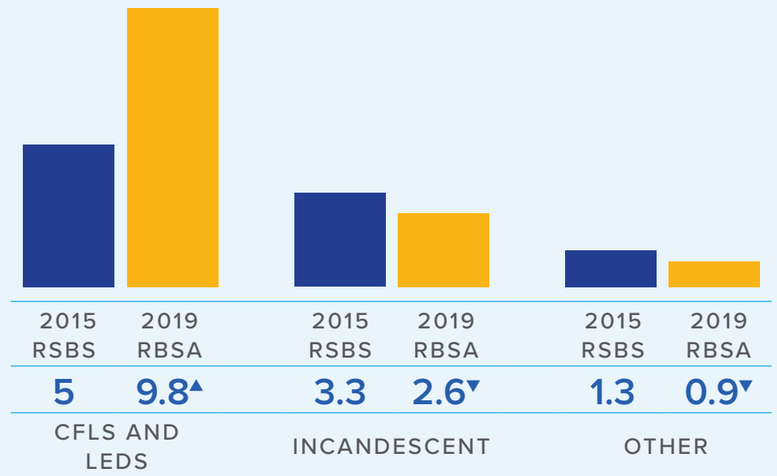
Incandescents still outnumber other stored bulbs, but LEDs are close behind in existing homes and have taken the lead in new homes.

	LED	CFL	INEFFICIENT
EXISTING HOMES	32%	24%	39%
NEW HOMES	63%	0%	37%

SEE THE DATA

AVERAGE NUMBER OF INTERIOR BULBS USED AT LEAST TWO HOURS PER DAY

Survey data show a **dramatic increase** in the number of **CFL or LED bulbs** used at least two hours a day.



SEE THE DATA

BATHROOM

CFL 18%
Inefficient 46%
LED 34%
Linear Fluorescent 1%

DEN/OFFICE

CFL 19%
Inefficient 39%
LED 32%
Linear Fluorescent 9%

CLOSET

CFL 20%
Inefficient 36%
LED 21%
Linear Fluorescent 23%

BEDROOM

CFL 24%
Inefficient 39%
LED 32%
Linear Fluorescent 3%

LIVING ROOM

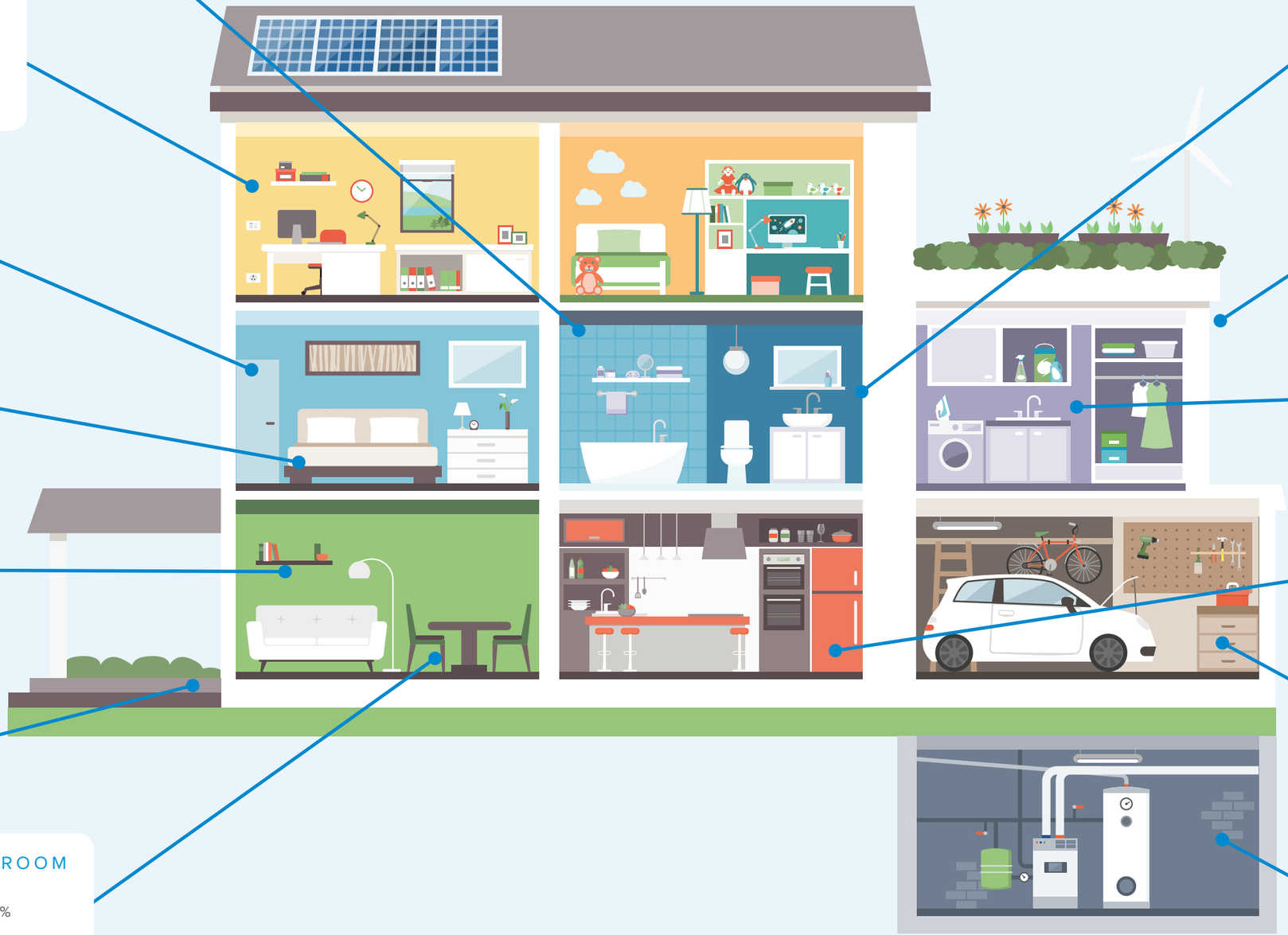
CFL 21%
Inefficient 38%
LED 39%
Linear Fluorescent 1%

ENTRYWAY

CFL 16%
Inefficient 53%
LED 28%
Linear Fluorescent 1%

DINING ROOM

CFL 9%
Inefficient 47%
LED 40%
Linear Fluorescent 1%



OTHER

CFL 37%
Inefficient 23%
LED 32%
Linear Fluorescent 8%

HALLWAY

CFL 24%
Inefficient 36%
LED 38%
Linear Fluorescent 1%

EXTERIOR

CFL 15%
Inefficient 45%
LED 31%
Linear Fluorescent 1%
Other 9%

LAUNDRY

CFL 20%
Inefficient 24%
LED 30%
Linear Fluorescent 26%

KITCHEN

CFL 12%
Inefficient 32%
LED 44%
Linear Fluorescent 8%

GARAGE

CFL 16%
Inefficient 28%
LED 19%
Linear Fluorescent 36%

UTILITY

CFL 16%
Inefficient 24%
LED 26%
Linear Fluorescent 34%

SEE THE DATA

SEE THE DATA

SECTION 6

APPLIANCES

Homeowners tend to know more about their appliances than about some other building characteristics, and the RBSA leveraged that knowledge with an abundance of questions on primary and additional appliances. Survey questions asked not only about the appliance units but also about patterns of usage, such as the number of loads per week where applicable. As with other equipment categories, most questions stayed at least close to those asked in the 2015 RSBS to allow for direct comparisons with the 2015 RSBS results.

Field technicians also collected information about each major appliances during site visits, including year of manufacture, type, fuel, whether it was labeled as ENERGY STAR rated, and for some appliances EnergyGuide information and/or model number. Where model numbers were collected, field staff attempted to look up characteristics such as ENERGY STAR status and EnergyGuide information online.

Appliances provide some striking examples of the differences between surveys and site visits as a means of primary data collection. On one hand, all survey respondents will presumably know how many of each type of major appliance is in their home, along with the basic type or configuration of each appliance. As illustrated in the ENERGY STAR appliances table below, however, a survey participant's knowledge or memory of whether each appliance is ENERGY STAR rated may be understandably limited.

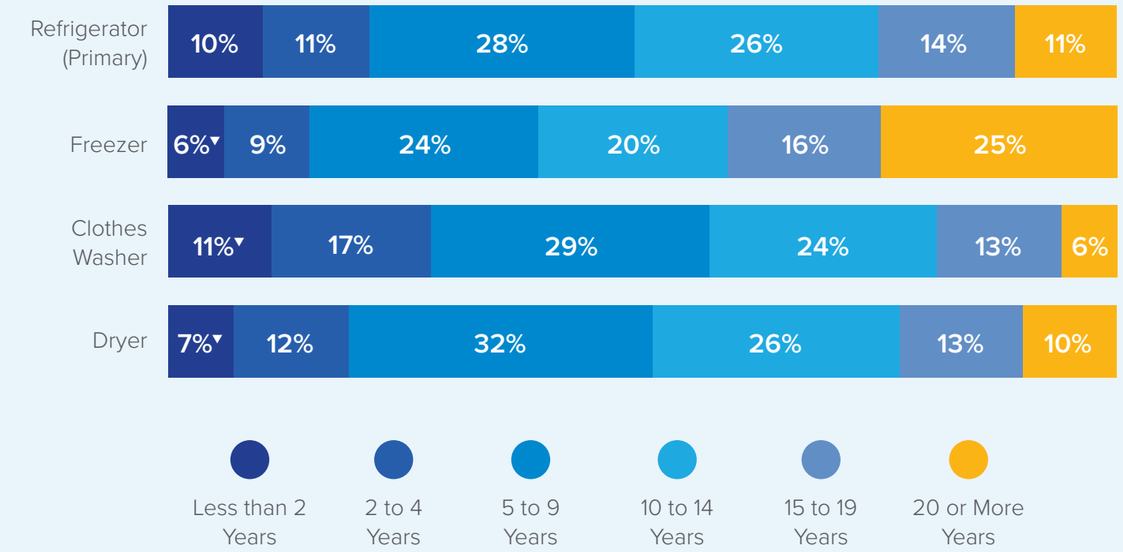
The ability of field staff to consistently identify ENERGY STAR appliances with accuracy is also up for debate. For this project, for instance, field staff were instructed to look for an ENERGY STAR label and, if not present, to search online for ENERGY STAR status, but it is likely that the site visit data somewhat underestimated the percentage of installed ENERGY STAR appliances because of missing or inaccessible labels. Where collected, model numbers are provided in the site visit data for implementers or researchers who need to determine with more certainty the percentage of qualifying ENERGY STAR appliances.

CODE/STANDARDS CHANGES

Federal energy efficiency standards can have a significant impact on appliance stock and efficiencies in particular. Appliances impacted by federal efficiency changes during the past five years include refrigerators and freezers (2014) and clothes dryers (2015).

APPLIANCE AGE

Roughly one-half of appliances are **10 years or older**, according to site visit data.



SEE THE DATA

KEY FINDINGS

OLD APPLIANCES

About one-half of appliances are 10 years or older, based on site visit data. Clothes washers have the lowest percentage that are at least 10 years old (43%) while stand-alone freezers have the highest (61%).

FUEL DIFFERENCES

Survey data show a significantly larger percentage of homes using natural gas clothes dryers than in the 2015 RSBS, at 43% instead of 32%. Electric clothes dryers make up 54%, compared with 64% in the previous study, and propane usage is down from 4% to 3%.

MULTIPLE REFRIGERATORS AND FREEZERS

One in four single-family homes statewide has a second refrigerator, and one in three has at least one stand-alone freezer, according to survey data. One in eight homes has at least one compact refrigerator. According to site visit data, 11% of refrigerators and 57% of stand-alone freezers are located in unconditioned spaces such as a garage.

ENERGY STAR APPLIANCES

As with the 2015 RSBS, survey respondents reported a much higher incidence of ENERGY STAR appliances less than 10 years old than identified through site visits. Survey results for the 2019 RBSA show significantly higher percentages of ENERGY STAR appliances than reported in the previous study, but site visit data showed no significant changes.

SEE THE DATA

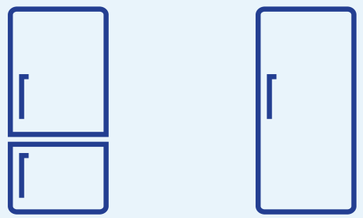
HOMES WITH MULTIPLE REFRIGERATORS AND FREEZERS

One-quarter of homes statewide have two full-size refrigerators. **One-third** have at least one stand-alone freezer.

NUMBER	FULL-SIZE REFRIGERATORS	COMPACT REFRIGERATORS	STAND-ALONE FREEZERS
0	0.4%	86%	66%
1	71%	13%	32%
2	25%	1%	2%
3	3%	0.1%	0.2%

REFRIGERATOR AND FREEZER LOCATION

More than half of stand-alone freezers are in an unconditioned space.



	REFRIGERATOR	FREEZER
CONDITIONED	89%	43%
UNCONDITIONED	11%	57%

SEE THE DATA

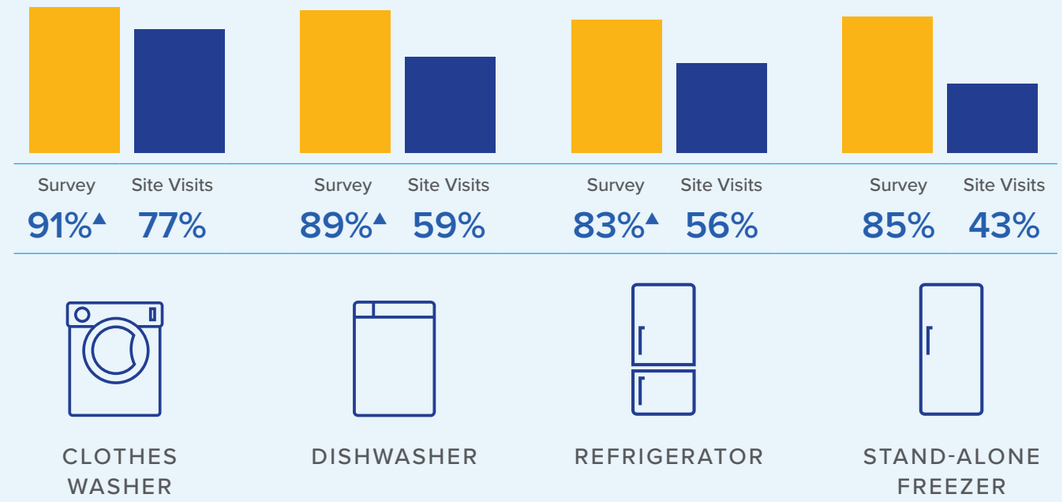
CLOTHES DRYER FUEL TYPE

Survey data show a **significant shift in clothes dryer fuel** from electricity and propane to natural gas.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Electricity	41%▼	59%▼	78%	54%▼
Natural Gas	58%▲	37%▲	14%	43%▲
Propane	1%▼	3%	8%	3%▼

PERCENTAGE OF ENERGY STAR APPLIANCE

For appliances less than 10 years old, surveys reported a **higher percentage as ENERGY STAR** than did site visits.



SEE THE DATA

SECTION 7

ELECTRONICS

Few aspects of homes have changed as dramatically as household electronics in recent years, thanks to transformational forces such as the internet and smart phones and the rapid adoption of flat-screen televisions. The RBSA used mostly the same survey questions and site visit procedures as the 2015 RSBS to collect data on household electronics and related plug loads, to ensure that at least most results could be directly compared.

The RBSA relied mostly on site visits to collect information about televisions. During site visits, field technicians characterized each television, including the type and size. Field staff also collected information about a variety of other electronics in each home, including counts of popular electronic components and office equipment.

Several results reported in this section draw on survey responses regarding the quantity and sometimes usage of various electronic components, from the number of cell phones used by household members to how many hours per day residents use desktop and laptop computers.

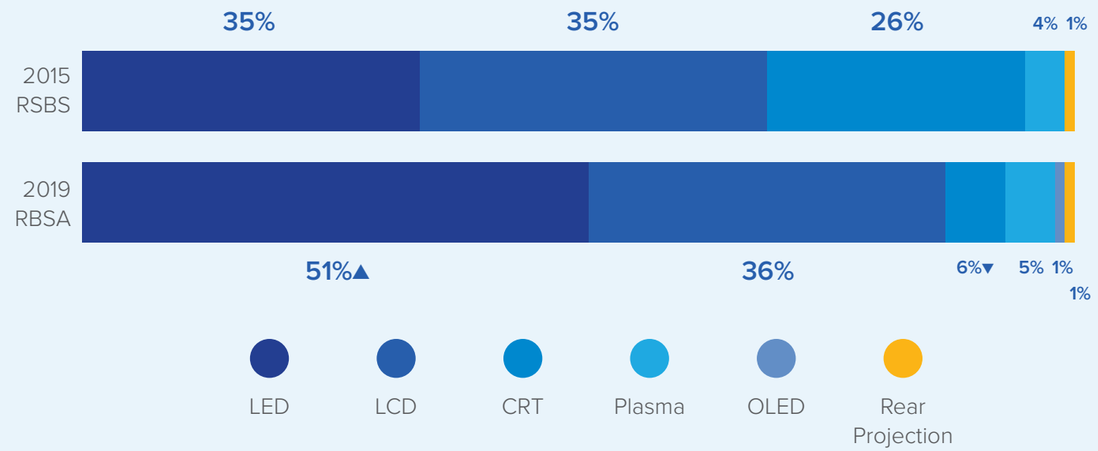
TELEVISION TECHNOLOGY

When characterizing televisions, it helps to be clear about the difference between liquid-crystal display (LCD) and LED televisions. Even with televisions marketed as LED, an LCD panel provides the pixels that make up the image, and a light source is required to bring the images to life.

The type of lighting determines whether the television is considered an LED television. With an LED television (really an LCD television with LED lighting), the television uses LEDs behind the LCD panel (or along the edges) rather than cold cathode fluorescent lamps (CCFLs). CCFL lighting is found mostly in older, thicker flat-screen televisions. Organic LED (OLED) technology promises better display quality, thinner screens, and lower energy usage by providing LEDs small enough to provide both the pixels and the light, doing away with the LCD panel.

DISTRIBUTION OF TELEVISION TYPES BY STUDY

LED and LCD televisions dominate with a **combined share of 87%** based on site visit data.



SEE THE DATA

KEY FINDINGS

LED LEADS THE WAY

LED televisions now make up more than half of all televisions statewide, according to site visit data, and LED and LCD televisions combined account for nearly 90%. CRT televisions show a sharp decline, at 6%, while OLED televisions have begun to appear.

TELEVISIONS GROW LARGER

Installed LED and LCD televisions screens are larger on average than reported in the 2015 RSBS, bringing the statewide average up significantly to 39 inches (compared with 33 inches in the previous study). CRT, plasma, and rear projection televisions remain about the same size.

SIGNS OF STREAMING

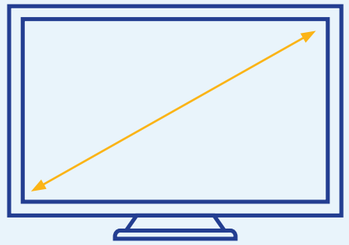
Survey participants reported significantly fewer traditional electronic components such as DVD players, VCRs, and stereo systems than in the 2015 RSBS. The numbers were not dramatically lower but likely illustrate the trends toward streaming video content and listening to music through phones.

MORE COMPUTERS USED LESS

Not surprisingly given the proliferation of smart phones, reported computer usage has declined significantly since the 2015 RSBS, down by more than 15%. That said, survey participants also reported having significantly more desktop and laptop computers in their household.

TELEVISION SCREEN SIZE BY TECHNOLOGY

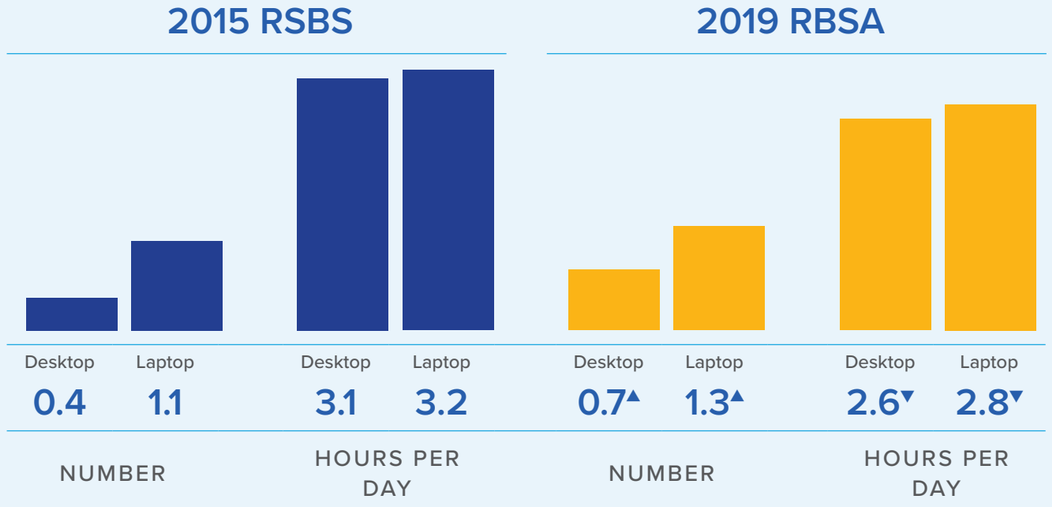
Average LED and LCD screen sizes have **grown significantly larger**.



	LED	LCD	CRT	PLASMA	REAR PROJECTION	OVERALL
2015 RSBS	38”	34”	24”	45”	62”	33”
2019 RBSA	42”▲	37”▲	24”	42”	65”	39”▲

NUMBER AND HOURS OF USE OF DESKTOP AND LAPTOP COMPUTERS

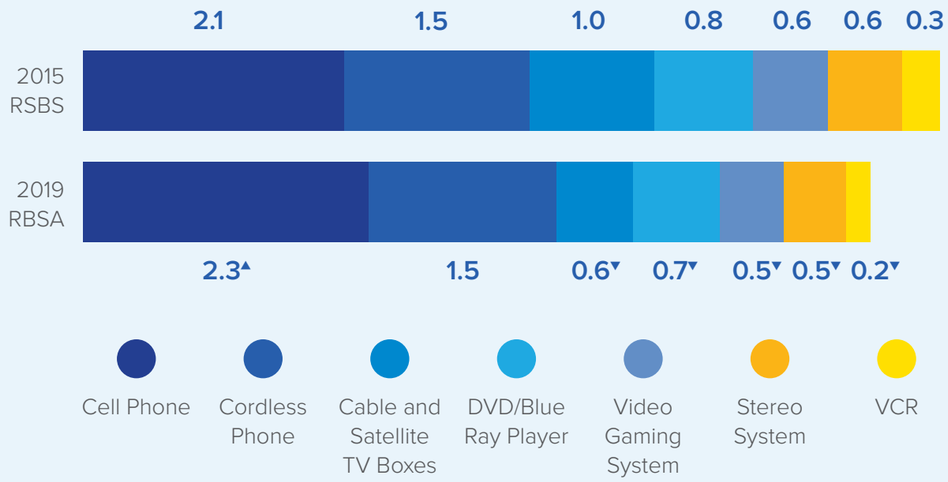
Survey participants reporting **owning more computers** than in the 2015 RSBS but using them fewer hours per day.



SEE THE DATA

AVERAGE NUMBER OF ELECTRONICS COMPONENTS PER HOME BY STUDY

Electronic plug load equipment saw **both an increase and decrease** in the number of devices per home.



SEE THE DATA

SMART STRIP USAGE AND TYPE BY STUDY

The use of **smart strips remains low**, based on survey data.

		2015 RSBS	2019 RBSA
Use Smart Strip	Yes	14%	13%
	No	86%	87%
Type of Smart Strip	Tier 1 smart strip[a]	85%	79%
	Tier 2 smart strip[b]	7%	10%
	Tier 1 and Tier 2	8%	11%

[a]Tier 1 smart strips turn off when the computer is powered off or goes to sleep.

[b]Tier 2 smart strips turn off when you leave or at a programmed time.

SEE THE DATA

SECTION 8
CONNECTED DEVICES

Data collection of connected devices is new for the 2019 RBSA and comprised survey questions and site visit tasks. Survey questions first asked participants if any equipment in the home could be controlled remotely and then asked them to identify specific types of equipment from a list. During site visits, field technicians identified whether the home included any of eight types of connected equipment. Results varied somewhat for connected equipment collected with the two methods, which may result from self-selection bias and/or from survey participant and field technician error.

RBSA data collection observed the distinction between connected and smart devices: A connected device can be controlled remotely, whereas a smart device can use learned or detected information to automatically alter operation or provide suggestions, such as modifying the temperature setpoint of a heating or cooling system based on learned usage patterns in the case of a smart thermostat. All smart devices are likely connected, but not all connected devices are smart.

KEY FINDINGS

CONNECTED DEVICES GAIN TRACTION

Almost one-quarter (24%) of homes statewide have at least one device that can be controlled remotely, according to survey responses. These devices span a wide range, from thermostats and lighting to major appliances and pool pumps.

THERMOSTATS GET CONNECTED

Survey responses show that 16% of single-family households with a central heating and/or cooling system statewide use a connected thermostat.

DIGITAL ASSISTANTS STAND OUT

Based on site visit data (not shown here), the most prevalent connected device is the digital assistant—smart speakers that use services such as Amazon Alexa, Apple Siri, or Google Assistant to respond to natural language questions and requests. Weighted results estimate that 29% of homes statewide have such a device, which can also control compatible home automation components. In survey results, which focused more on equipment that can be controlled remotely, connected thermostats were by far the most prevalent.

SEE THE DATA

CONNECTED AND SMART THERMOSTATS

Of homes with central heating and/or cooling, **16% statewide have a connected thermostat** according to survey data.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Connected Thermostat*	20%	13%	7%	16%
Smart Thermostat	14%	10%	4%	11%

**Includes smart thermostats*

CONNECTED HOMES WITH EACH TYPE OF CONNECTED DEVICE

Percentages show the **proportion of homes with each type of device** for homes with at least one connected device.

	CLIMATE ZONE 4	CLIMATE ZONE 5	CLIMATE ZONE 6	
Have at Least One Device	31%	20%	13%	24%
Type of Device in Homes with at Least One Device				
Thermostat	54%	51%	34%	52%
Security	39%	32%	36%	37%
Lights	32%	35%	40%	33%
Other	16%	20%	31%	19%
Pool Pump	2%	1%	0%	2%
Major Appliance(s)	1%	3%	5%	2%
Whole House Humidifying	1%	2%	0%	1%
Water Heating Equipment	1%	1%	2%	1%

SEE THE DATA

SECTION 9

ENERGY EFFICIENCY PROGRAM AWARENESS AND PARTICIPATION

The 2019 RBSA web and telephone survey used similar questions related to energy efficiency programs as the 2015 RSBS, both to collect information about current participation and to note changes relative to the previous study. The survey asked three questions:

- In the past five 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?
- What type of equipment did you install or recycle through a program?
- What do you think are the challenges with participating in energy efficiency programs?

Only the third question differed from its 2015 version, which asked "Why hasn't your household participated in any energy efficiency programs?" Other survey questions asked about willingness to replace equipment in the next five years and the perception of the level of energy efficiency of the participants' homes.

KEY FINDINGS

PARTICIPATION REMAINED THE SAME

Compared with the 12.2% who reported participating in an energy efficiency program in the 2015 RSBS, the 10.5% reported in the 2019 RBSA was lower but not statistically different.

AC PARTICIPATION INCREASED

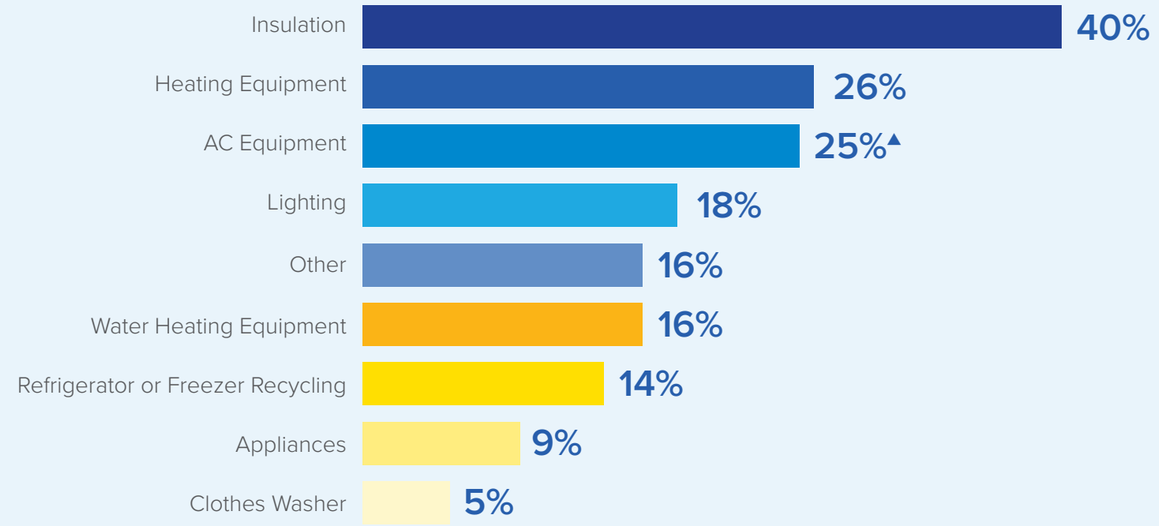
Of respondents who reported participating in energy efficiency rebate or recycling programs, 25% reported participating in an air conditioning rebate or recycling program—up from 14% in the 2015 RSBS.

KNOWLEDGE REMAINS KEY

As with the 2015 RSBS, more than 50% of survey respondents who did not participate in an energy efficiency program reported that they did not know of any programs. Compared with 2015 respondents, twice the percentage (30%) reported in the current study that they did not know who to contact. The percentage of respondents who reported not being able to afford installing new equipment (29%) also increased significantly from 19% in 2015.

REPORTED PROGRAM PARTICIPATION

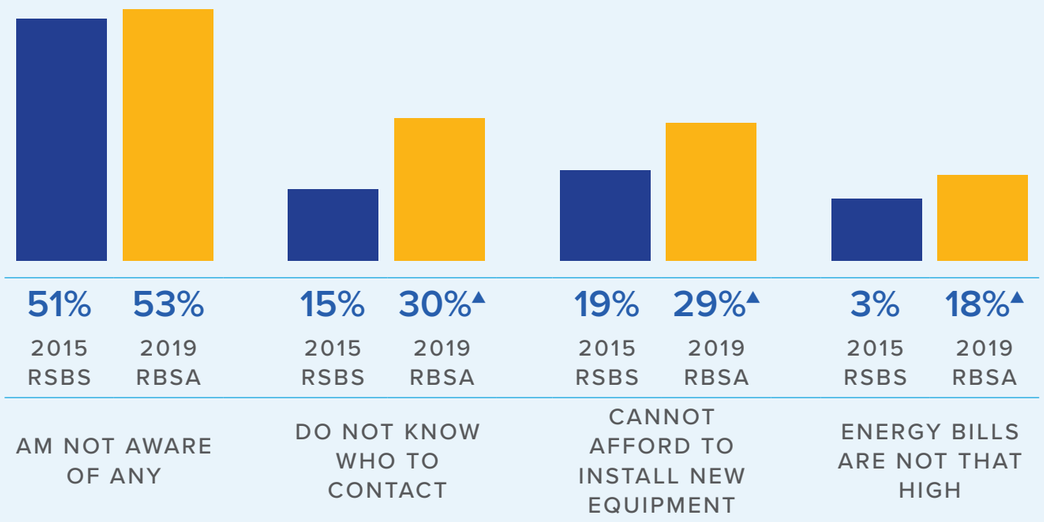
The table shows program participation for the **10.5% of survey respondents** who reported participating in an energy efficiency program.



SEE THE DATA

TOP REASONS FOR NOT PARTICIPATING IN ENERGY EFFICIENCY PROGRAMS

Significantly more people reported **not knowing who to contact** than in the 2015 RSBS.



SEE THE DATA

APPENDIX A. DATA TABLES FROM SURVEYS AND SITE VISITS

This appendix presents findings for the New York State Energy Research and Development Authority (NYSERDA) 2019 Residential Building Stock Assessment (RBSA) based on data collected through online and telephone surveys and site visits. The title of each table indicates whether that table is based on survey data (Survey), site visit data (Site), or both (Survey and Site). Cadmus developed and applied sampling weights to ensure that all observations were weighted proportionally to the segment of the population represented by the sample. Refer to Appendix B. Detailed Methodology for a description of the weighting methods.

Where practical during analysis, Cadmus tested for statistically significant differences between results of the current study and the 2015 RSBS. Statistically significant differences between the two reports are denoted by either a ▲ or ▼ symbol, indicating whether the 2019 RBSA value is higher or lower than the value in the 2015 RSBS study. These 2019 RBSA tables also identify which table in the previous study, if applicable, was used to draw conclusions about each statistically significant difference.

New tables and categories presented in this document that do not have a corollary in the 2015 RSBS do not have symbols indicating statistically significant increases or decreases from the 2015 RSBS, though statistically significant differences may exist. Without a comparable table in the 2015 RSBS report, statistical testing could not be performed.

Because of the small sample size for new homes site visits in Climate Zone 4, new home site visit results for Climate Zone 4 should not be considered representative. To eliminate the possibility of those results skewing Climate Zone 4 results for existing and new homes or overall statewide results, Cadmus eliminated observations for those five homes when calculating site visit results. For tables that present results for new homes by climate zone, values for Climate Zone 4 remain in the tables with shading and a table note regarding the small sample size, but these Climate Zone 4 values do not impact other results.

All tables include n values to document sample sizes along with error bounds to provide a measure of the uncertainty of the data. Cadmus calculated the error bounds (EB) as the standard error multiplied by a t-statistic and provide the half-width of the 90% confidence interval. Error bounds, or absolute precision, have the same units as the estimate. When reporting precision, absolute precision is typically reported for percentages or distributions while relative precision is typically reported for means or totals. To calculate the relative precision for a given mean or total, divide the EB by the associated estimate. With percentages, the reported EB represents the absolute precision.

LIST OF TABLES

1.1 RBSA Tables

TABLE 1. WEB AND TELEPHONE SURVEY SITE WEIGHTS

Climate Zone	Population		Survey Completions		Survey Weights	
	Existing Homes	New Homes	Existing Homes	New Homes	Existing Homes	New Homes
Climate Zone 4	2,516,613	12,105	515	38	4,886.63	318.55
Climate Zone 5	1,945,375	18,451	913	420	2,130.75	43.93
Climate Zone 6	807,178	7,169	407	126	1,983.24	56.90
Total	5,269,166	37,725	1,835	584		

Source: Population estimates for existing homes were based on 2016 ACS 5-Year Estimates. Population estimates for new homes were based on Building Permits Survey data from census.gov.

TABLE 2. SITE VISIT SITE WEIGHTS

Climate Zone	Population		Site Visit Completions		Site Visit Weights	
	Existing Homes	New Homes	Existing Homes	New Homes	Existing Homes	New Homes
Climate Zone 4	2,516,613	12,105	85	5	29,607.21	2,421.00
Climate Zone 5	1,945,375	18,451	206	68	9,443.57	271.34
Climate Zone 6	807,178	7,169	70	22	11,531.11	325.86
Total	5,269,166	37,725	361	95		

Source: Population estimates for existing homes were based on 2016 ACS 5-Year Estimates. Population estimates for new homes were based on Building Permits Survey data from census.gov.

TABLE 3. NUMBER OF HOUSEHOLD MEMBERS BY AGE AND CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 24, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Less than 5 Years	0.1▼	0.0	0.2	0.0	0.2	0.0	0.2▼	0.0
6 to 17 Years	0.5	0.1	0.4	0.0	0.4	0.1	0.4	0.0
18 to 24 Years	0.3	0.0	0.2	0.0	0.1▼	0.0	0.2	0.0
25 to 34 Years	0.3	0.1	0.3▼	0.0	0.3	0.1	0.3▼	0.0
35 to 44 Years	0.3▼	0.0	0.3	0.0	0.3	0.0	0.3	0.0
45 to 54 Years	0.4	0.1	0.4	0.0	0.3	0.1	0.4	0.0
55 to 64 Years	0.6	0.1	0.5▲	0.0	0.5	0.1	0.5▲	0.0
65 Years or Older	0.6▲	0.1	0.5▲	0.1	0.5	0.1	0.5▲	0.0
Total Household Members	3.1	0.1	2.6▲	0.1	2.5	0.1	2.8	0.1
Respondents (n)	476	476	1,224	1,224	497	497	2,197	2,197

Source: Survey fields: ['Number of People Age 25-34', 'Number of People Age <5', 'Number of People Age 6-17', 'Number of People Age 18-24', 'Number of People Age 35-44', 'Number of People Age 45-54', 'Number of People Age 55-64', 'Number of People Age >65', 'Climate Zone'].

TABLE 4. NUMBER OF HOUSEHOLD MEMBERS BY AGE AND HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 25, VOLUME 5, IN 2015 RSBS.

Age	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Less than 5 Years	0.2▼	0.0	0.3	0.1	0.2▼	0.0
6 to 17 Years	0.4	0.0	0.5	0.1	0.4	0.0
18 to 24 Years	0.2	0.0	0.1	0.1	0.2	0.0
25 to 34 Years	0.3▼	0.0	0.5	0.1	0.3▼	0.0
35 to 44 Years	0.3	0.0	0.5	0.1	0.3	0.0
45 to 54 Years	0.4	0.0	0.4	0.1	0.4	0.0
55 to 64 Years	0.5▲	0.0	0.4	0.1	0.5▲	0.0
65 Years or Older	0.5▲	0.0	0.3	0.0	0.5▲	0.0
Total Household Members	2.8	0.1	3.1	0.2	2.8	0.1
Respondents (n)	1,662	1,662	535	535	2,197	2,197

Source: Survey fields: ['Number of People Age 25-34', 'Number of People Age <5', 'Number of People Age 6-17', 'Number of People Age 18-24', 'Number of People Age 35-44', 'Number of People Age 45-54', 'Number of People Age 55-64', 'Number of People Age >65', 'Construction Type'].

BACK TO REPORT

TABLE 5. HIGHEST LEVEL OF EDUCATION BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 26, VOLUME 5, IN 2015 RSBS.

Education	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than High School	0.0%	0.0%	0.2%	0.3%	0.0%	0.0%	0.1%▼	0.1%
Some High School	0.0%▼	0.0%	0.1%▼	0.2%	0.3%	0.4%	0.1%▼	0.1%
High School Graduate or Equivalent (e.g., GED)	3.4%▼	1.4%	6.6%▼	1.4%	7.2%▼	2.1%	5.2%▼	0.9%
Trade or Technical School	0.9%▼	0.7%	2.7%▼	0.9%	4.1%▼	1.6%	2.1%▼	0.5%
Some College, No Degree	6.8%▼	1.9%	11.7%	1.8%	13.4%	2.8%	9.6%▼	1.2%
College Degree (e.g., Bachelor's Degree)	38.7%▲	3.7%	35.0%▲	2.6%	41.2%▲	4.1%	37.7%▲	2.1%
Some Graduate School	6.4%	1.8%	5.9%	1.3%	3.3%	1.5%	5.8%	1.0%
Graduate Degree (e.g., Master's or Doctorate Degree)	43.9%	3.8%	37.7%▲	2.7%	30.5%	3.8%	39.5%▲	2.1%
Respondents (n)	505	505	1,279	1,279	511	511	2,295	2,295

Source: Survey fields: ['Highest Education Level', 'Climate Zone'].

TABLE 6. HIGHEST LEVEL OF EDUCATION BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 27, VOLUME 5, IN 2015 RSBS.

Education	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Less than High School	0.1%▼	0.1%	0.0%	0.0%	0.1%▼	0.1%
Some High School	0.1%▼	0.1%	1.3%	1.5%	0.1%▼	0.1%
High School Graduate or Equivalent (e.g., GED)	5.2%▼	0.9%	3.1%	1.7%	5.2%▼	0.9%
Trade or Technical School	2.1%▼	0.5%	2.2%▼	1.6%	2.1%▼	0.5%
Some College, No Degree	9.7%▼	1.2%	6.6%	2.4%	9.6%▼	1.2%
College Degree (e.g., Bachelor's Degree)	37.7%▲	2.1%	34.0%	4.7%	37.7%▲	2.1%
Some Graduate School	5.8%	1.0%	5.0%	2.3%	5.8%	1.0%
Graduate Degree (e.g., Master's or Doctorate Degree)	39.5%▲	2.1%	48.0%	5.1%	39.5%▲	2.1%
Respondents (n)	1,733	1,733	562	562	2,295	2,295

Source: Survey fields: ['Highest Education Level', 'Construction Type'].

TABLE 7. 2017 ANNUAL HOUSEHOLD INCOME BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 6, VOLUME 1, IN 2015 RSBS.

Annual Income	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than $25,000	3.9%▼	1.8%	6.6%▼	1.5%	5.8%▼	2.1%	5.2%▼	1.1%
$25,000–Less than $30,000	2.6%	1.5%	4.2%	1.3%	5.5%	2.1%	3.6%▼	0.9%
$30,000–Less than $35,000	2.6%▼	1.5%	4.1%▼	1.2%	6.7%	2.3%	3.8%▼	0.9%
$35,000–Less than $50,000	4.2%▼	1.9%	10.6%▼	1.9%	10.1%▼	2.7%	7.5%▼	1.2%
$50,000–Less than $75,000	12.6%	3.1%	20.6%	2.5%	24.0%	3.9%	17.3%	1.9%
$75,000–Less than $100,000	17.4%	3.5%	17.7%	2.4%	21.4%	3.7%	18.1%	2.0%
$100,000–Less than $150,000	26.8%▲	4.1%	24.2%▲	2.7%	17.9%▲	3.5%	24.5%▲	2.3%
$150,000–Less than $200,000	13.8%▲	3.2%	8.0%▲	1.7%	5.3%	2.0%	10.3%▲	1.7%
$200,000 or More	16.2%	3.4%	4.0%	1.2%	3.4%	1.6%	9.7%	1.7%
Respondents (n)	334	334	1,006	1,006	425	425	1,765	1,765

Source: Survey fields: ['Household Income', 'Climate Zone'].

TABLE 8. 2017 ANNUAL HOUSEHOLD INCOME BY HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 28, VOLUME 5, IN 2015 RSBS.

Annual Income	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Less than $25,000	5.2%▼	1.1%	3.2%	2.3%	5.2%▼	1.1%
$25,000–Less than $30,000	3.6%▼	0.9%	2.3%	2.3%	3.6%▼	0.9%
$30,000–Less than $35,000	3.8%▼	0.9%	4.1%	3.1%	3.8%▼	0.9%
$35,000–Less than $50,000	7.5%▼	1.2%	3.2%▼	1.3%	7.5%▼	1.2%
$50,000–Less than $75,000	17.3%	1.9%	14.8%	4.8%	17.3%	1.9%
$75,000–Less than $100,000	18.1%	2.0%	14.3%	3.3%	18.1%	2.0%
$100,000–Less than $150,000	24.4%▲	2.3%	32.7%	5.7%	24.5%▲	2.3%
$150,000–Less than $200,000	10.3%▲	1.7%	9.6%	2.2%	10.3%▲	1.7%
$200,000 or More	9.7%	1.8%	15.9%	5.1%	9.7%	1.7%
Respondents (n)	1,320	1,320	445	445	1,765	1,765

Source: Survey fields: ['Household Income', 'Construction Type'].

TABLE 9. HOUSEHOLD MEMBERS WHO WORK PRIMARILY FROM HOME BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 22, VOLUME 5, IN 2015 RSBS.

Household Members		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
At Least One Household Member Primarily Works from Home	Yes	15.4%	2.6%	13.7%	1.9%	13.5%	2.8%	14.5%	1.5%
	No	84.6%	2.6%	86.3%	1.9%	86.5%	2.8%	85.5%	1.5%
	Respondents (n)	544	544	1,313	1,313	527	527	2,384	2,384
Number of People Who Primarily Work from Home	Mean	1.6	0.8	1.1▼	0.1	1.1▼	0.1	1.3	0.4
	Respondents (n)	85	85	182	182	76	76	343	343

Note: The mean value shown for "Number of people who work primarily from home" represents the mean only for households who reported that at least one person works at home.

Source: Survey fields: ['People Working at Home', 'Work from Home', 'Climate Zone'].

TABLE 10. SINGLE-FAMILY HOME TYPE BY AGE (SURVEY)
COMPARE WITH FIGURE 2, VOLUME 1, IN 2015 RSBS.

Year	Single-Family Detached House		Single-Family Attached House		Mobile or Manufactured Home		Apartment Building or Condominium	
	%	EB	%	EB	%	EB	%	EB
1939 or Earlier	84.5%	3.3%	11.1%	2.9%	0.0%	0.0%	4.4%	1.7%
1940 to 1949	87.8%	5.2%	10.8%	5.1%	0.5%	0.8%	1.0%	1.1%
1950 to 1959	94.8%	2.5%	4.8%	2.4%	0.2%	0.4%	0.2%	0.4%
1960 to 1969	94.1%	3.0%	4.5%	2.6%	0.3%	0.5%	1.0%	1.3%
1970 to 1979	90.9%	4.2%	7.5%	3.9%	1.3%	1.6%	0.4%	0.7%
1980 to 1989	86.7%	5.1%	8.3%	4.4%	3.3%	2.1%	1.7%	2.1%
1990 to 1999	78.4%	6.2%	14.8%	5.8%	5.3%	2.5%	1.5%	1.9%
2000 to 2009	81.2%	6.5%	11.6%	5.8%	4.0%	2.4%	3.2%	3.1%
2009 to 2014	83.9%	9.9%	8.5%	7.4%	5.0%	5.7%	2.6%	4.1%
2015	92.0%	5.3%	4.6%	4.3%	3.4%	2.1%	0.0%	0.0%
2016	88.9%	6.5%	6.6%	4.7%	4.1%	3.3%	0.3%	0.4%
2017	84.9%	9.9%	11.6%	9.7%	1.9%	2.2%	1.6%	1.9%
2018	84.1%	0.0%	15.9%	0.0%	0.0%	0.0%	0.0%	0.0%
All Ages	87.9%	1.5%	8.8%	1.3%	1.4%	0.4%	1.9%	0.6%
Respondents (n)	2,151	2,151	155	155	61	61	40	40

Note: This table provides similar information as Figure 2 of volume 1 of the 2015 RSBS, but numbers precise enough to allow significance testing could not be extracted from that figure.

Source: Survey fields: ['Home Description', 'Year of Home', 'Construction Type'].

TABLE 11. AGE OF SINGLE-FAMILY BUILDING STOCK BY CLIMATE ZONE (SURVEY AND SITE)

COMPARE WITH TABLE 8, VOLUME 1, IN 2015 RSBS.

Year	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide		Site Visit	
	%	EB	%	EB	%	EB	%	EB	%	EB
1939 or Earlier	30.5%	3.3%	19.9%▼	2.2%	20.2%▼	3.3%	25.0%	1.9%	31.9%	0.6%
1940 to 1949	10.4%	2.2%	6.3%	1.3%	6.2%	2.0%	8.3%	1.2%	8.3%	0.3%
1950 to 1959	19.9%	2.9%	17.5%▲	2.1%	12.3%	2.7%	17.9%	1.6%	13.4%	0.4%
1960 to 1969	13.7%	2.5%	13.0%	1.8%	7.7%	2.2%	12.5%	1.4%	13.0%	0.4%
1970 to 1979	7.5%	1.9%	11.3%	1.7%	16.0%▲	3.0%	10.2%	1.2%	9.7%	0.4%
1980 to 1989	4.4%	1.5%	10.1%	1.6%	13.6%	2.8%	7.9%	1.0%	6.4%	0.3%
1990 to 1999	6.6%	1.8%	10.5%▲	1.7%	10.6%	2.5%	8.6%	1.1%	7.8%	0.3%
2000 to 2009	5.2%	1.6%	8.3%	1.5%	9.6%	2.4%	7.0%	1.0%	6.1%	0.3%
2010 to 2014	0.6%	0.6%	2.2%	0.8%	2.7%	1.3%	1.5%	0.4%	2.9%	0.2%
2015	0.3%	0.3%	0.3%	0.0%	0.6%	0.4%	0.4%	0.2%	0.2%	0.0%
2016	0.6%	0.5%	0.4%	0.1%	0.4%	0.1%	0.5%	0.2%	0.1%	0.0%
2017	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%	0.1%	0.0%
2018	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Respondents (n)	553	553	1,326	1,326	528	528	2,407	2,407	451	451

Note: Results for 2010 and later cannot be compared with results from the 2015 RSBS.

Source: Survey fields: ['Year of Home', 'Climate Zone'], On-site fields: ['Year Building Built', 'Climate Zone'].

TABLE 12. EXISTING HOMES: TYPICAL SINGLE-FAMILY HOME PROFILE (SURVEY AND SITE)

COMPARE WITH TABLE 9, VOLUME 1, IN 2015 RSBS.

Characteristic		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
Home Built in 1939 or Earlier[a]	Percentage	30.7%	3.4%	20.1%	2.2%	20.4%	3.3%	25.2%	1.9%
	Respondents (n)	515	515	906	906	402	402	1,823	1,823
Home Square Feet Less than 2,000[a]	Percentage	54.2%	4.0%	63.0%	2.7%	61.7%	4.2%	58.6%▼	2.2%
	Respondents (n)	430	430	841	841	373	373	1,644	1,644
Average Number of Bedrooms[a]	Mean	3.5	0.1	3.3	0.0	3.3	0.1	3.4▲	0.0
	Respondents (n)	510	510	909	909	407	407	1,826	1,826
Most Common House Type (Single-Family Detached)[a]	Percentage	82.7%	2.7%	93.3%	1.4%	89.9%	2.5%	87.7%▲	1.5%
	Respondents (n)	515	515	913	913	407	407	1,835	1,835
Annual Energy Consumption 6,000 to 12,000 kWh[b]	Percentage	54.9%	9.9%	49.0%	5.9%	41.3%	10.4%	50.6%▲	5.4%
	Respondents (n)	71	71	194	194	63	63	328	328
Occupancy - Own/Buying[a]	Percentage	99.4%	0.6%	96.1%	1.1%	94.1%	1.9%	97.4%▲	0.6%
	Respondents (n)	510	510	909	909	405	405	1,824	1,824
Average Number of Occupants[a]	Mean	3.1	0.1	2.6	0.1	2.5	0.1	2.8	0.1
	Respondents (n)	446	446	844	844	380	380	1,670	1,670
Annual Household Income of $75,000 or More[a]	Percentage	58.0%	4.6%	49.9%	3.1%	44.5%	4.5%	52.9%▲	2.6%
	Respondents (n)	334	334	1,006	1,006	425	425	1,765	1,765
Highest Education Level in Household of Graduate Degree[a]	Percentage	43.8%	3.8%	37.6%	2.7%	30.4%	3.9%	39.5%▲	2.1%
	Respondents (n)	470	470	875	875	388	388	1,733	1,733

[a] From survey data; [b] From site visit data

Source: Survey fields: [‘Number of Bedrooms,’ ‘Number of People Age <5,’ ‘Number of People Age 6-17,’ ‘Number of People Age 18-24,’ ‘Number of People Age 25-34,’ ‘Number of People Age 35-44,’ ‘Number of People Age 45-54,’ ‘Number of People Age 55-64,’ ‘Number of People Age >65,’ ‘Square Feet of Home,’ ‘Approximate Square Feet of Home,’ ‘Home Description,’ ‘Ownership,’ ‘Household Income,’ ‘Highest Education Level,’ ‘Year of Home’]; On-site fields: [‘Climate Zone,’ ‘Electricity Annual Usage (kWh)’].Source: Survey fields: ['Number of Bedrooms', 'Number of People Age <5', 'Number of People Age 6-17', 'Number of People Age 18-24', 'Number of People Age 25-34', 'Number of People Age 35-44', 'Number of People Age 45-54', 'Number of People Age 55-64', 'Number of People Age >65', 'Square Feet of Home', 'Approximate Square Feet of Home', 'Home Description', 'Ownership', 'Household Income', 'Highest Education Level', 'Year of Home', 'Climate Zone'], On-site fields: ['Electricity Annual Usage (kWh)', 'Climate Zone'].

BACK TO REPORT

TABLE 13. NEW HOMES: TYPICAL HOME PROFILE (SURVEY AND SITE)
COMPARE WITH TABLE 10, VOLUME 1, IN 2015 RSBS.

Characteristic		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
Average HERS Rating[a]	Mean	67.6	27.7	53.9	4.6	60.4	8.2	55.7▼	3.9
	Respondents (n)	5	5	68	68	22	22	90	90
Home Built in 2015[b]	Percentage	28.9%	12.6%	35.7%	3.9%	37.3%	7.2%	33.8%▼	4.6%
	Respondents (n)	38	38	420	420	126	126	584	584
Home Less than 2,000 Square Feet[b]	Percentage	47.2%	14.3%	38.7%	4.0%	56.8%	7.6%	44.9%▲	5.0%
	Respondents (n)	36	36	406	406	118	118	560	560
Average Number of Bedrooms[b]	Mean	3.8	0.3	3.3	0.1	3.0	0.1	3.4	0.1
	Respondents (n)	37	37	415	415	125	125	577	577
Annual Energy Consumption 5,470 to 8,202 kWh[a]	Percentage	20.0%	47.1%	15.0%	7.8%	38.1%	18.8%	21.5%	7.7%
	Respondents (n)	5	5	60	60	21	21	81	81
Most Common Home Type (Single-Family Detached)[B]	Percentage	73.7%	12.2%	90.0%	2.4%	84.9%	5.3%	83.8%▼	4.2%
	Respondents (n)	38	38	420	420	126	126	584	584
Occupancy - Own/Buying[b]	Percentage	100.0%	0.0%	98.1%	1.1%	98.4%	1.9%	98.8%	0.7%
	Respondents (n)	38	38	419	419	125	125	582	582
Annual Household Income of $75,000 or More[b]	Percentage	37.5%	17.3%	65.6%	4.4%	65.3%	8.0%	56.5%▼	6.2%
	Respondents (n)	24	24	323	323	98	98	445	445
Average Number of Occupants[b]	Mean	3.6	0.4	2.8	0.1	2.9	0.2	3.1	0.2
	Respondents (n)	30	30	386	386	119	119	535	535
Highest Education Level in Household of Graduate Degree[b]	Percentage	51.4%	14.5%	47.3%	4.1%	43.9%	7.4%	48.0%	5.1%
	Respondents (n)	35	35	404	404	123	123	562	562

[a] *From site visit data.*
[b] *From survey data*

Note: Shaded cells indicate results that cannot be considered representative because of the small sample size for new home site visits in Climate Zone 4.

Source: Survey fields: ['Number of Bedrooms', 'Number of People Age <5', 'Number of People Age 6-17', 'Number of People Age 18-24', 'Number of People Age 25-34', 'Number of People Age 35-44', 'Number of People Age 45-54', 'Number of People Age 55-64', 'Number of People Age >65', 'Square Feet of Home', 'Approximate Square Feet of Home', 'Home Description', 'Ownership', 'Household Income', 'Highest Education Level', 'Year of Home', 'Climate Zone'], On-site fields: ['Home Energy Rating Systems Score', 'Electricity Annual Usage (kWh)', 'Climate Zone'].

BACK TO REPORT

TABLE 14. EXISTING HOMES: CONDITIONED AREA BY CLIMATE ZONE (SURVEY AND SITE)
COMPARE WITH TABLE 12, VOLUME 1, IN 2015 RSBS.

Area	Web and Telephone Surveys								Site Visits	
	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Less than 1,000 Square Feet	4.7%▼	1.7%	5.0%▼	1.2%	6.7%▼	2.1%	5.1%▼	1.0%	5.0%▼	1.8%
1,000 to Less than 1,500 Square Feet	20.9%	3.2%	25.6%	2.5%	23.9%	3.6%	23.1%	1.9%	19.9%	4.0%
1,500 to Less than 2,000 Square Feet	28.6%	3.6%	32.5%	2.7%	31.1%▲	4.0%	30.4%	2.1%	32.5%▲	4.6%
2,000 to Less than 2,500 Square Feet	22.1%▲	3.3%	20.3%	2.3%	22.3%	3.6%	21.5%▲	1.9%	16.8%	3.8%
2,500 to Less than 3,000 Square Feet	12.1%	2.6%	10.5%▲	1.7%	8.6%	2.4%	11.0%▲	1.4%	15.7%▲	3.8%
3,000 to Less than 4,000 Square Feet	8.8%	2.3%	4.8%	1.2%	5.9%	2.0%	6.9%	1.2%	7.8%	2.7%
4,000 or More Square Feet	2.8%	1.3%	1.4%▼	0.7%	1.6%	1.1%	2.1%▼	0.7%	2.2%▼	1.7%
Respondents (n)	430	430	841	841	373	373	1,644	1,644	361	361

Note: Conditioned area as defined for the survey excludes unfinished basements. Site visits used the RESNET definition of conditioned floor area, which considers directly heated unfinished basements as conditioned.

Source: Survey fields: ['Square Feet of Home', 'Approximate Square Feet of Home', 'Climate Zone'], On-site fields: ['Conditioned Floor Space (measured in square feet)', 'Climate Zone'].

BACK TO REPORT

TABLE 15. NEW HOMES: CONDITIONED AREA BY CLIMATE ZONE (SURVEY AND SITE)
COMPARE WITH TABLE 13, VOLUME 1, IN 2015 RSBS.

Area	Web and Telephone Surveys								Site Visits	
	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Less than 1,000 Square Feet	2.8%	4.6%	0.5%	0.6%	3.4%	2.8%	1.8%	1.6%	1.1%	1.8%
1,000 to Less than 1,500 Square Feet	13.9%	9.8%	11.3%	2.6%	18.6%	6.0%	13.5%	3.5%	10.6%	5.6%
1,500 to Less than 2,000 Square Feet	30.6%	13.0%	26.8%	3.6%	34.7%	7.3%	29.5%	4.6%	18.9%	6.9%
2,000 to Less than 2,500 Square Feet	11.1%	8.9%	33.5%	3.9%	21.2%	6.2%	24.0%	3.8%	9.7%▼	5.2%
2,500 to Less than 3,000 Square Feet	13.9%	9.8%	17.5%	3.1%	11.0%	4.8%	15.1%	3.5%	20.6%	7.2%
3,000 to Less than 4,000 Square Feet	13.9%	9.8%	7.6%▼	2.2%	7.6%	4.1%	9.6%	3.3%	23.9%	7.5%
4,000 or More Square Feet	13.9%	9.8%	2.7%	1.3%	3.4%	2.8%	6.4%	3.2%	15.3%	6.3%
Respondents (n)	36	36	406	406	118	118	560	560	90	90

Note: Conditioned area as defined for the survey excludes unfinished basements. Site visits used the RESNET definition of conditioned floor area, which considers directly heated unfinished basements as conditioned.

Source: Survey fields: ['Square Feet of Home', 'Approximate Square Feet of Home', 'Climate Zone'], On-site fields: ['Conditioned Floor Space (measured in square feet)', 'Climate Zone'].

BACK TO REPORT

TABLE 16. STYLE OF HOME BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 77, VOLUME 5, IN 2015 RSBS.

Style	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Colonial	35.3%▲	8.6%	40.8%	5.6%	22.7%	8.3%	35.4%▲	4.8%
Ranch	11.8%	5.8%	17.1%▼	4.3%	26.0%	8.6%	15.9%▼	3.5%
Cape Cod	12.9%	6.1%	13.0%	3.8%	10.0%	5.9%	12.5%	3.3%
Raised Ranch[a]	5.9%	4.2%	6.7%	2.9%	17.0%	7.4%	7.9%	2.6%
Split Level	4.7%	3.8%	5.8%	2.7%	7.1%	5.1%	5.5%	2.2%
Row House	10.6%	5.6%	0.5%	0.8%	0.0%	0.0%	5.2%	2.7%
Other	4.7%	3.8%	3.9%	2.2%	5.8%	4.6%	4.6%	2.1%
Victorian	3.5%	3.3%	3.4%▼	2.1%	4.2%	4.0%	3.6%	1.8%
Townhouse	5.9%▼	4.2%	1.5%	1.4%	0.0%	0.0%	3.3%▼	2.1%
Duplex[a]	3.5%	3.3%	1.0%	1.1%	2.9%	3.3%	2.5%	1.7%
Farm House	0.0%	0.0%	2.5%	1.8%	1.5%	2.3%	1.1%	0.8%
Log Cabin	0.0%	0.0%	1.9%	1.6%	0.0%▼	0.1%	0.7%	0.6%
Salt Box	1.2%	1.9%	0.5%	0.8%	0.0%	0.0%	0.7%	1.0%
Modular	0.0%	0.0%	0.5%	0.8%	2.8%	3.3%	0.6%	0.6%
Bungalow	0.0%	0.0%	0.5%▼	0.8%	0.0%	0.0%	0.2%▼	0.3%
Contemporary	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%▼	0.3%
A-Frame	0.0%	0.0%	0.0%	0.0%	0.0%▼	0.1%	0.0%▼	0.0%
Respondents (n)	85	85	274	274	92	92	451	451

[a] *Values for Raised Ranch and Duplex cannot be compared to 2015 RSBS values.*

Source: On-site fields: ['Style of Home', 'Climate Zone'].

TABLE 17. STYLE OF HOME BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 78, VOLUME 5, IN 2015 RSBS.

Style	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Colonial	35.4%▲	4.8%	35.4%	8.3%	35.4%▲	4.8%
Ranch	15.8%▼	3.5%	37.5%	8.6%	15.9%▼	3.5%
Cape Cod	12.6%	3.3%	2.3%	2.7%	12.5%	3.3%
Raised Ranch[a]	7.9%	2.6%	1.1%	1.8%	7.9%	2.6%
Split Level	5.5%	2.2%	2.1%	2.5%	5.5%	2.2%
Row House	5.2%	2.7%	0.0%	0.0%	5.2%	2.7%
Other	4.6%	2.1%	5.9%	4.3%	4.6%	2.1%
Victorian	3.6%	1.9%	2.1%	2.5%	3.6%	1.8%
Townhouse	3.3%▼	2.1%	1.1%	1.8%	3.3%▼	2.1%
Duplex[a]	2.5%	1.7%	1.3%	2.1%	2.5%	1.7%
Farm House	1.1%	0.8%	5.5%	4.0%	1.1%	0.8%
Log Cabin	0.7%	0.6%	1.3%	2.1%	0.7%	0.6%
Salt Box	0.7%	1.0%	0.0%	0.0%	0.7%	1.0%
Modular	0.6%	0.6%	0.0%	0.0%	0.6%	0.6%
Bungalow	0.2%▼	0.3%	0.0%	0.0%	0.2%▼	0.3%
Contemporary	0.2%▼	0.3%	1.1%	1.8%	0.2%▼	0.3%
A-Frame	0.0%	0.0%	3.4%	3.2%	0.0%▼	0.0%
Respondents (n)	361	361	90	90	451	451

[a] *Values for Raised Ranch and Duplex cannot be compared to 2015 RSBS values.*

Source: On-site fields: ['Style of Home', 'Construction Type'].

TABLE 18. NUMBER OF STORIES BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 29, VOLUME 5, IN 2015 RSBS.

Stories	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	2.0▼	0.0	1.8▼	0.0	1.7▼	0.0	1.9▼	0.0
Respondents (n)	551	551	1,329	1,329	530	530	2,410	2,410

Note: This table does not include unfinished basements.

Source: Survey fields: ['Number of Stories', 'Climate Zone'].

TABLE 19. NUMBER OF STORIES BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 30, VOLUME 5, IN 2015 RSBS.

Stories	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Mean	1.9▼	0.0	1.7▼	0.0	1.9▼	0.0
Respondents (n)	1,827	1,827	583	583	2,410	2,410

Note: This table does not include unfinished basements.

Source: Survey fields: ['Number of Stories', 'Construction Type'].

TABLE 20. MAJOR RENOVATION IN PAST FIVE YEARS BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 32, VOLUME 5, IN 2015 RSBS.

Renovation	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	13.3%	2.5%	10.2%	1.7%	13.6%	2.8%	12.2%	1.4%
No	86.7%	2.5%	89.8%	1.7%	86.4%	2.8%	87.8%	1.4%
Respondents (n)	549	549	1,310	1,310	525	525	2,384	2,384

Source: Survey fields: ['Major Renovations', 'Climate Zone'].

TABLE 21. EXISTING HOMES: ANNUAL KILOWATT-HOUR CONSUMPTION BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 14, VOLUME 1, IN 2015 RSBS.

Annual kWh Consumption	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
500 kWh or Less	5.6%	4.6%	0.0%	0.0%	1.6%	2.6%	2.9%	2.2%
501 to 2,500 kWh	2.8%▼	3.3%	3.1%▼	2.1%	3.2%▼	3.7%	3.0%▼	1.8%
2,501 to 6,000 kWh	23.9%	8.5%	30.4%	5.5%	30.2%	9.7%	27.3%	4.7%
6,001 to 12,000 kWh	54.9%▲	9.9%	49.0%	5.9%	41.3%	10.4%	50.6%▲	5.4%
12,001 to 20,000 kWh	11.3%	6.3%	13.9%	4.1%	17.5%	8.0%	13.2%	3.5%
20,001 kWh or More	1.4%	2.3%	3.6%	2.2%	6.4%	5.1%	3.0%	1.6%
Respondents (n)	71	71	194	194	63	63	328	328

Note: This table shows annual usage from bills or bill summaries provided during site visits. Significance testing compares results to utility billing data for 2015 RSBS survey participants.

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Climate Zone'].

BACK TO REPORT

TABLE 22. NEW HOMES: ANNUAL KILOWATT-HOUR CONSUMPTION BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 14, VOLUME 1, IN 2015 RSBS.

Annual Consumption	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
500 kWh or Less	**0.0%**	**0.0%**	10.0%	6.5%	0.0%	0.0%	7.2%	4.7%
501 to 2,500 kWh	**0.0%**	**0.0%**	11.7%	7.0%	0.0%	0.0%	8.4%	5.1%
2,501 to 6,000 kWh	**75.0%**	**63.6%**	16.7%	8.1%	23.8%	16.2%	18.7%	7.3%
6,001 to 12,000 kWh	**25.0%**	**63.6%**	30.0%	10.0%	47.6%	19.0%	34.9%	8.9%
12,001 to 20,000 kWh	**0.0%**	**0.0%**	28.3%	9.8%	9.5%	11.1%	23.1%	7.8%
20,001 kWh or More	**0.0%**	**0.0%**	3.3%	3.9%	19.1%	14.9%	7.7%	5.1%
Respondents (n)	5	5	60	60	21	21	81	81

Note: This table shows annual usage from bills or bill summaries provided during site visits. Significance testing compares results to utility billing data for 2015 RSBS survey participants.
[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new home site visits in Climate Zone 4.

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Climate Zone'].

BACK TO REPORT

TABLE 23. EXISTING HOMES: ESTIMATED ANNUAL ELECTRIC COSTS BY CLIMATE ZONE (SURVEY) COMPARE WITH TABLE 15, VOLUME 1, IN 2015 RSBS.

Annual Cost	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
$500 or Less	2.7%	1.4%	5.6%	1.4%	5.5%▼	2.0%	4.2%	0.9%
$501 to $1,000	3.6%	1.6%	8.3%▼	1.7%	13.6%▼	3.0%	6.9%▼	1.1%
$1,001 to $1,500	11.7%	2.8%	18.9%▼	2.4%	20.0%▼	3.6%	15.6%▼	1.7%
$1,501 to $2,000	14.2%▼	3.0%	23.2%▲	2.6%	19.1%	3.5%	18.3%	1.8%
$2,001 to $2,500	13.9%	3.0%	21.3%▲	2.5%	18.0%▲	3.4%	17.3%▲	1.8%
$2,501 to $3,000	11.5%	2.7%	9.4%▲	1.8%	7.8%▲	2.4%	10.2%▲	1.5%
$3,001 to $3,500	13.1%▲	2.9%	6.2%▲	1.5%	6.4%▲	2.2%	9.5%▲	1.5%
$3,501 to $4,000	8.5%	2.4%	3.7%▲	1.2%	4.6%▲	1.9%	6.1%▲	1.3%
$4,000 or More	20.8%	3.5%	3.4%▲	1.1%	4.9%▲	1.9%	11.9%▲	1.8%
Respondents (n)	366	366	710	710	345	345	1,421	1,421

Source: Survey fields: ['All Fuel Yearly Cost', 'Climate Zone'].

TABLE 24. NEW HOMES: ESTIMATED ANNUAL ELECTRIC COSTS BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 15, VOLUME 1, IN 2015 RSBS.

Annual Cost	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
$500 or Less	18.5%	12.8%	10.9%▲	2.8%	14.7%	5.6%	14.0%▲	4.3%
$501 to $1,000	14.8%	11.7%	13.2%	3.0%	15.6%	5.8%	14.2%	4.1%
$1,001 to $1,500	14.8%	11.7%	23.5%	3.8%	25.7%	7.0%	21.1%	4.3%
$1,501 to $2,000	18.5%	12.8%	21.4%	3.7%	20.2%	6.4%	20.2%	4.5%
$2,001 to $2,500	11.1%	10.3%	13.8%	3.1%	9.2%	4.6%	12.0%	3.6%
$2,501 to $3,000	7.4%	8.6%	8.5%	2.5%	7.3%	4.1%	7.9%	3.0%
$3,001 to $3,500	0.0%	0.0%	3.5%	1.6%	3.7%	3.0%	2.4%	1.0%
$3,501 to $4,000	7.4%	8.6%	3.5%	1.6%	2.8%	2.6%	4.6%	2.8%
$4,000 or More	7.4%▼	8.6%	1.8%	1.2%	0.9%	1.5%	3.4%▼	2.8%
Respondents (n)	27	27	341	341	109	109	477	477

Source: Survey fields: ['All Fuel Yearly Cost', 'Climate Zone'].

TABLE 25. AVERAGE ANNUAL FUEL USE PER HOME BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
Electricity	Mean (kBtu)	27,317	2,944	28,635	1,904	30,955	4,547	28,365	1,697
	Respondents (n)	71	71	254	254	84	84	409	409
Natural Gas	Mean (kBtu)	98,368	13,474.	99,056	5,743.6	111,824	30,313	100,692	8,004
	Respondents (n)	53	53	198	198	32	32	283	283
Other[a]	Mean (kBtu)	131,109	20,298	100,142	17,266	95,475	19,974	112,681	11,719
	Respondents (n)	21	21	53	53	49	49	123	123
All Fuels	Mean (kBtu)	149,660	12,501	128,758	5,777	133,008	19,182	139,346	6,946
	Respondents (n)	62	62	245	245	80	80	387	387

Note: Presents average annual consumption for electricity, natural gas, and other fuels only for homes that use those fuels based on information collected from bills and home occupants during site visits. Average annual fuel use for the all fuels category represents average total fuel consumption for home. For all fuels averages, homes with unknown usage values for any fuel were excluded from the calculation. New York State energy content values for each fuel were drawn from the NYSERDA report Patterns and Trends New York Energy Profiles: 2002-2016. *Where necessary, cost per-unit energy consumption values were taken from the U.S. Energy Information Administration. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.*

[a] *The Other fuel type includes fuel oil, propane, kerosene, wood, wood pellets, and coal, and usage data collected for each are approximate.*

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Natural Gas Annual Usage', 'Natural Gas Annual Usage Units', 'Other Fuel 1 Type', 'Other Fuel 1 Annual Usage Units', 'Other Fuel 2 Type', 'Other Fuel 2 Annual Usage Units', 'Conditioned Floor Space (measured in square feet)', 'Climate Zone'].

TABLE 26. AVERAGE ANNUAL FUEL USE PER HOME BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type		Existing Construction		New Construction		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB
Electricity	Mean (kBtu)	28,354.7	1,706.6	30,558.2	4,383.2	28,365.4	1,697.0
	Respondents (n)	328	328	81	81	409	409
Natural Gas	Mean (kBtu)	100,787.1	8,051.2	81,196.5	13,149.5	100,692.3	8,004.3
	Respondents (n)	236	236	47	47	283	283
Other[a]	Mean (kBtu)	113,088.1	11,830.2	49,775.9	11,038.6	112,680.7	11,719.8
	Respondents (n)	93	93	30	30	123	123
All Fuels	Mean (kBtu)	139,559.0	6,984.1	95,615.9	10,881.6	139,346.4	6,946.1
	Respondents (n)	307	307	80	80	387	387

Note: Presents average annual consumption for electricity, natural gas, and other fuels only for homes that use those fuels based on information collected from bills and home occupants during site visits. Average annual fuel use for the all fuels category represents average total fuel consumption for home. For all fuels averages, homes with unknown usage values for any fuel were excluded from the calculation. State energy content values for each fuel were drawn from the NYSERDA report Patterns and Trends New York Energy Profiles: 2002-2016. *Where necessary, cost per-unit energy consumption values were taken from the U.S. Energy Information Administration. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.*

[a] *The Other fuel type includes fuel oil, propane, kerosene, wood, wood pellets, and coal, and usage data collected for each are approximate.*

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Natural Gas Annual Usage', 'Natural Gas Annual Usage Units', 'Other Fuel 1 Type', 'Other Fuel 1 Annual Usage Units', 'Other Fuel 2 Type', 'Other Fuel 2 Annual Usage Units', 'Conditioned Floor Space (measured in square feet)', 'Construction Type'].

TABLE 27. AVERAGE ENERGY USE INTENSITY (EUI) BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
Electricity	Mean (kBtu/sq ft)	14.0	1.6	16.3	1.1	18.1	2.3	15.4	0.9
	Respondents (n)	71	71	254	254	84	84	409	409
Natural Gas	Mean (kBtu/sq ft)	50.3	9.3	54.1	3.4	70.2	13.5	54.8	5.0
	Respondents (n)	53	53	198	198	32	32	283	283
Other[a]	Mean (kBtu/sq ft)	66.8	8.3	60.3	11.1	55.8	15.8	61.9	6.5
	Respondents (n)	21	21	53	53	49	49	123	123
All Fuels	Mean (kBtu/sq ft)	76.8	8.7	71.7	3.7	80.3	11.8	75.5	4.6
	Respondents (n)	62	62	245	245	80	80	387	387

Note: Presents the average energy use intensity (EUI) for each home for electricity, natural gas, and other fuels only for homes that use those fuels based on information collected from bills and home occupants during site visits. Average annual EUI for the all fuels category represents average total fuel consumption per square foot for each home. For all fuels averages, homes with unknown usage values for any fuel were excluded from the calculation. Average EUI was calculated by averaging the EUI for each home, not by dividing total consumption by total conditioned area for each stratum; accordingly, multiplying the total number of single-family homes by the average EUI will not yield a highly accurate estimate of total consumption. State energy content values for each fuel were drawn from the NYSERDA report Patterns and Trends New York Energy Profiles: 2002-2016. *Where necessary, cost per-unit energy consumption values were taken from the U.S. Energy Information Administration. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.*

[a] *The Other fuel type includes fuel oil, propane, kerosene, wood, wood pellets, and coal, and usage data collected for each are approximate.*

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Conditioned Floor Space (measured in square feet)', 'Natural Gas Annual Usage', 'Natural Gas Annual Usage Units', 'Other Fuel 1 Type', 'Other Fuel 1 Annual Usage Units', 'Other Fuel 2 Type', 'Other Fuel 2 Annual Usage Units', 'Climate Zone'].

TABLE 28. AVERAGE ENERGY USE INTENSITY (EUI) BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type		Existing Construction		New Construction		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB
Electricity	Mean (kBtu/sq ft)	15.5	0.9	12.3	1.8	15.4	0.9
	Respondents (n)	328	328	81	81	409	409
Natural Gas	Mean (kBtu/sq ft)	54.9	5.0	28.2	3.9	54.8	5.0
	Respondents (n)	236	236	47	47	283	283
Other[a]	Mean (kBtu/sq ft)	62.2	6.5	22.9	5.6	61.9	6.5
	Respondents (n)	93	93	30	30	123	123
All Fuels	Mean (kBtu/sq ft)	75.7	4.7	37.0	3.9	75.5	4.6
	Respondents (n)	307	307	80	80	387	387

Note: Presents the average of EUI for each home for electricity, natural gas, and other fuels only for homes that use those fuels based on information collected from bills and home occupants during site visits. Average annual EUI for the all fuels category represents average total fuel consumption per square foot for each home. For all fuels averages, homes with unknown usage values for any fuel were excluded from the calculation. Average EUI was calculated by averaging the EUI for each home, not by dividing total consumption by total conditioned area for each stratum; accordingly, multiplying the total number of single-family homes by the average EUI will not yield a highly accurate estimate of total consumption. State energy content values for each fuel were drawn from the NYSERDA report Patterns and Trends New York Energy Profiles: 2002-2016. *Where necessary, cost per-unit energy consumption values were taken from the U.S. Energy Information Administration. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.*

[a] *The Other fuel type includes fuel oil, propane, kerosene, wood, wood pellets, and coal, and usage data collected for each are approximate.*

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Conditioned Floor Space (measured in square feet)', 'Natural Gas Annual Usage', 'Natural Gas Annual Usage Units', 'Other Fuel 1 Type', 'Other Fuel 1 Annual Usage Units', 'Other Fuel 2 Type', 'Other Fuel 2 Annual Usage Units', 'Construction Type'].

TABLE 29. DISTRIBUTION OF TOTAL FUEL USAGE PER HOME BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Electricity	19.3%	5.1%	22.0%	3.2%	23.5%	6.8%	20.8%	3.0%
Natural Gas	54.5%	9.2%	62.7%	4.9%	38.6%	11.3%	55.0%	5.3%
Other[a]	26.2%	8.9%	15.3%	4.4%	37.9%	10.8%	24.2%	5.1%
Respondents (n)	62	62	245	245	80	80	387	387

Note: This table shows the estimated saturation of each fuel type—electricity, natural gas, and other fuels—as a percentage of total fuel consumption for single-family homes based on information collected from bills and home occupants during site visits. Homes with unknown usage values for any fuel were excluded from the calculation. State energy content values for each fuel were drawn from the NYSERDA report Patterns and Trends New York Energy Profiles: 2002-2016*. Where necessary, cost per-unit energy consumption values were taken from the U.S. Energy Information Administration. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.*

[a] *The Other fuel type includes fuel oil, propane, kerosene, wood, wood pellets, and coal, and usage data collected for each are approximate.*

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Natural Gas Annual Usage', 'Natural Gas Annual Usage Units', 'Other Fuel 1 Type', 'Other Fuel 2 Type', 'Other Fuel 1 Annual Usage Units', 'Other Fuel 2 Annual Usage Units', 'Climate Zone'].

TABLE 30. DISTRIBUTION OF TOTAL FUEL USAGE PER HOME BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type	Existing Construction		New Construction		Overall Statewide	
	%	EB	%	EB	%	EB
Electricity	20.8%	3.0%	32.2%	7.2%	20.8%	3.0%
Natural Gas	55.0%	5.3%	49.8%	8.9%	55.0%	5.3%
Other[a]	24.2%	5.1%	18.0%	6.5%	24.2%	5.1%
Respondents (n)	307	307	80	80	387	387

Note: This table shows the estimated saturation of each fuel type—electricity, natural gas, and other fuels—as a percentage of total fuel consumption for single-family homes based on information collected from bills and home occupants during site visits. Homes with unknown usage values for any fuel were excluded from the calculation. State energy content values for each fuel were drawn from the NYSERDA report Patterns and Trends New York Energy Profiles: 2002-2016. *Where necessary, cost per-unit energy consumption values were taken from the U.S. Energy Information Administration. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.*

[a] *The Other fuel type includes fuel oil, propane, kerosene, wood, wood pellets, and coal, and usage data collected for each are approximate.*

Source: On-site fields: ['Electricity Annual Usage (kWh)', 'Natural Gas Annual Usage', 'Natural Gas Annual Usage Units', 'Other Fuel 1 Type', 'Other Fuel 2 Type', 'Other Fuel 1 Annual Usage Units', 'Other Fuel 2 Annual Usage Units', 'Construction Type'].

TABLE 31. MORE THAN ONE ELECTRIC METER AT ADDRESS BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 33, VOLUME 5, IN 2015 RSBS.

More than One Meter	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	4.0%▼	1.6%	2.1%▼	0.8%	3.3%	1.5%	3.2%▼	0.8%
No	96.0%▲	1.6%	97.9%▲	0.8%	96.7%	1.5%	96.8%▲	0.8%
Respondents (n)	456	456	1,245	1,245	510	510	2,211	2,211

Source: Survey fields: ['Multiple Electric Meters', 'Climate Zone'].

TABLE 32. ELECTRIC UTILITY PROVIDER BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 34, VOLUME 5, IN 2015 RSBS.

Electricity Provider	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
National Grid	7.2%▲	1.9%	54.5%▲	2.7%	49.1%	4.0%	31.2%▲	1.8%
Consolidated Edison	52.6%	3.6%	0.0%	0.0%	0.0%	0.0%	25.0%	2.1%
Long Island Power Authority	38.9%▼	3.5%	0.0%	0.0%	0.0%	0.0%	18.5%	1.9%
New York State Electric and Gas	0.6%	0.6%	20.7%▼	2.2%	40.8%	4.0%	14.2%▼	1.2%
Rochester Gas & Electric	0.2%	0.3%	14.7%	1.9%	1.2%	0.9%	5.7%	0.8%
Other	0.6%	0.6%	3.8%	1.0%	6.1%	1.9%	2.6%	0.6%
Central Hudson	0.0%	0.0%	4.1%	1.1%	2.5%	1.3%	1.9%	0.4%
Orange & Rockland	0.0%	0.0%	2.1%▼	0.8%	0.3%	0.4%	0.8%▼	0.3%
Respondents (n)	550	550	1,326	1,326	533	533	2,409	2,409

Source: Survey fields: ['Electric Utility', 'Climate Zone'].

TABLE 33. NATURAL GAS PROVIDER BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 35, VOLUME 5, IN 2015 RSBS.

Natural Gas Provider	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
National Grid	67.7%▲	3.9%	38.1%▲	3.1%	49.8%▲	6.1%	54.4%▲	2.5%
National Fuel Gas Distribution Corporation	0.0%	0.0%	25.1%▲	2.7%	2.2%	1.8%	10.0%▲	1.2%
Consolidated Edison	18.4%▼	3.2%	0.0%	0.0%	0.0%	0.0%	9.5%▼	1.7%
New York State Electric & Gas Corporation	0.5%	0.6%	13.7%	2.2%	34.2%	5.8%	8.9%	1.2%
Rochester Gas Company	0.0%	0.0%	17.1%	2.4%	0.0%	0.0%	6.7%	1.0%
Keyspan Energy Delivery (New York)	6.9%	2.1%	0.0%	0.0%	0.0%	0.0%	3.6%	1.1%
Keyspan Energy Delivery (Long Island)	4.4%▼	1.7%	0.0%	0.0%	0.0%	0.0%	2.2%	0.9%
Other	2.1%	1.2%	1.6%▼	0.8%	3.3%	2.2%	2.0%▼	0.7%
Central Hudson Gas & Electric Corporation	0.0%	0.0%	1.7%	0.8%	1.1%	1.3%	0.8%	0.3%
Orange & Rockland	0.0%	0.0%	1.8%▼	0.8%	0.0%	0.0%	0.7%▼	0.3%
St. Lawrence Gas Company	0.0%	0.0%	0.0%	0.0%	5.0%	2.7%	0.5%	0.3%
Corning Natural Gas Corporation	0.0%	0.0%	0.1%	0.2%	3.3%	2.2%	0.4%	0.2%
Reserve Gas Company	0.0%	0.0%	0.6%	0.5%	0.0%	0.0%	0.2%	0.2%
Bath Electric, Gas & Water System[a]	0.0%	0.0%	0.0%	0.0%	1.1%	1.3%	0.1%	0.1%
Valley Energy[a]	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.1%	0.1%
Respondents (n)	422	422	964	964	212	212	1,598	1,598

[a] *Bath Electric, Gas & Water System and Valley Energy did not appear as 2015 RSBS utilities.*

Source: Survey fields: ['Natural Gas Provider', 'Climate Zone'].

TABLE 34. NATURAL GAS PROVIDER BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 36, VOLUME 5, IN 2015 RSBS.

Natural Gas Provider	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
National Grid	54.4%▲	2.5%	55.7%▲	6.3%	54.4%▲	2.5%
National Fuel Gas Distribution Corporation	10.0%▲	1.2%	12.1%	2.6%	10.0%▲	1.2%
Consolidated Edison	9.5%▼	1.7%	2.5%▼	2.9%	9.5%▼	1.7%
New York State Electric & Gas Corporation	8.9%	1.2%	8.6%	2.2%	8.9%	1.2%
Rochester Gas Company	6.6%	1.0%	10.3%	2.4%	6.7%	1.0%
Keyspan Energy Delivery (New York)	3.6%	1.1%	2.5%	2.9%	3.6%	1.1%
Keyspan Energy Delivery (Long Island)	2.3%▼	0.9%	1.3%	2.1%	2.2%	0.9%
Other	2.0%▼	0.7%	1.6%	2.1%	2.0%▼	0.7%
Central Hudson Gas & Electric Corporation	0.7%	0.3%	2.7%	1.2%	0.8%	0.3%
Orange & Rockland	0.7%▼	0.3%	2.1%▼	1.0%	0.7%▼	0.3%
St. Lawrence Gas Company	0.5%	0.3%	0.2%	0.4%	0.5%	0.3%
Corning Natural Gas Corporation	0.4%	0.2%	0.2%	0.4%	0.4%	0.2%
Reserve Gas Company	0.2%	0.2%	0.0%	0.0%	0.2%	0.2%
Bath Electric, Gas & Water System[a]	0.1%	0.1%	0.2%	0.3%	0.1%	0.1%
Valley Energy[a]	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%
Respondents (n)	1,242	1,242	356	356	1,598	1,598

[a] *Bath Electric, Gas & Water System and Valley Energy did not appear as 2015 RSBS utilities.*

Source: Survey fields: ['Natural Gas Provider', 'Construction Type'].

TABLE 35. WHO PAYS FOR NATURAL GAS BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 37, VOLUME 5, IN 2015 RSBS.

Pays Bills	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Household Member/Occupant	98.7%▲	0.9%	99.7%▲	0.3%	99.5%▲	0.9%	99.2%▲	0.5%
Landlord	1.3%▼	0.9%	0.3%▼	0.3%	0.5%▼	0.9%	0.8%▼	0.5%
Respondents (n)	434	434	975	975	217	217	1,626	1,626

Source: Survey fields: ['Natural Gas Bill Payee', 'Climate Zone'].

TABLE 36. WHO PAYS FOR NATURAL GAS BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 38, VOLUME 5, IN 2015 RSBS.

Pays Bills	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Household Member/Occupant	99.2%▲	0.5%	96.2%	3.5%	99.2%▲	0.5%
Landlord	0.8%▼	0.5%	3.8%	3.5%	0.8%▼	0.5%
Respondents (n)	1,267	1,267	359	359	1,626	1,626

Source: Survey fields: ['Natural Gas Bill Payee', 'Construction Type'].

TABLE 37. PERCENTAGE OF EQUIPMENT LESS THAN 10 YEARS OLD THAT IS ENERGY STAR BY CLIMATE ZONE (SURVEY AND SITE)
COMPARE WITH TABLE 55, VOLUME 1, IN 2015 RSBS.

Equipment Type		Web and Telephone Surveys								Site Visits	
		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB	%	EB
Clothes Washer[a]	% ENERGY STAR	93.0%▲	2.5%	88.9%▲	2.3%	87.9%	3.6%	90.7%▲	1.6%	76.9%	5.9%
	Respondents (n)	312	312	810	810	307	307	1,429	1,429	237	237
Primary Cooling System[a]	% ENERGY STAR	92.4%▲	2.9%	86.4%	3.0%	89.4%	3.9%	89.9%▲	1.9%	64.8%	8.2%
	Respondents (n)	241	241	597	597	234	234	1,072	1,072	126	126
Dishwasher[b]	% ENERGY STAR	92.8%▲	2.9%	86.1%	2.8%	87.5%	4.3%	89.4%▲	1.9%	59.4%	6.3%
	Respondents (n)	231	231	702	702	245	245	1,178	1,178	295	295
Stand-Alone Freezer	% ENERGY STAR	88.7%▲	8.0%	82.3%	5.7%	83.9%	7.7%	84.9%▲	4.1%	42.9%	13.4%
	Respondents (n)	45	45	169	169	81	81	295	295	65	65
Primary Heating System	% ENERGY STAR	85.3%	5.5%	86.3%▲	3.3%	73.3%	7.2%	84.0%▲	2.9%	57.2%	9.8%
	Respondents (n)	134	134	569	569	172	172	875	875	151	151
Refrigerator	% ENERGY STAR	86.5%▲	3.5%	80.5%▲	3.1%	80.2%▲	4.8%	83.5%▲	2.2%	55.6%▲	6.7%
	Respondents (n)	283	283	736	736	272	272	1,291	1,291	257	257
Programmable Thermostat[a,d]	% Installed	66.2%	3.5%	65.7%	2.6%	51.6%	4.1%	63.8%▼	2.0%	69.5%	3.8%
	Respondents (n)	538	538	1,296	1,296	508	508	2,342	2,342	436	436
Smart Thermostat[c,d]	% Installed	13.9%	2.5%	10.2%	1.7%	4.4%	1.7%	11.1%	1.4%	5.8%	2.0%
	Respondents (n)	538	538	1,296	1,296	508	508	2,342	2,342	436	436
Clothes Dryer - Heat Pump Dryer	% Installed	4.2%	2.1%	2.5%	1.2%	0.0%▼	0.0%	2.9%	1.0%	0.0%	0.0%
	Respondents (n)	270	270	796	796	296	296	1,362	1,362	0	0

[a] *On-site results for heat pump clothes dryers, primary cooling, and programmable thermostats cannot be compared with 2015 RSBS results, which showed values of NA.*
[b] *Dishwashers included in site inspection results may be more than 10 years old.*
[c] *Smart thermostats were not included in the 2015 RSBS, so smart thermostat results cannot be compared with 2015 RSBS results.*
[c] *Included thermostats may be more than 10 years old.*
Source: Survey fields: ['Energy Star Primary Heat System', 'Age of Primary Heating System', 'Thermostat Type', 'Energy Star Air Conditioning', 'Age of Primary Air Conditioning', 'Energy Star Automatic Dishwasher', 'Age of Automatic Dishwasher', 'Energy Star Fridge', 'Age of Fridge', 'Energy Star Standalone Freezer', 'Age of First Freezer', 'Energy Star Clothes Washer', 'Age of Clothes Washer', 'Heat Pump Clothes Dryer', 'Age of Clothes Dryer', 'Climate Zone'], On-site fields: ['Equipment Category', 'Is HVAC Heating Primary or Secondary Source?', 'HVAC System Year Manufactured', 'Is HVAC System ENERGY STAR?', 'HVAC Controls Thermostat Type', 'Is HVAC Cooling Primary or Secondary Source?', 'Number of HVAC Systems', 'Appliance Energy Star Certified?', 'Number of Appliance Units', 'Appliance Manufacture Year', 'Climate Zone'].

BACK TO REPORT

TABLE 38. PRIMARY HEATING SYSTEM TYPE BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 17, VOLUME 1, IN 2015 RSBS.

Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Central Forced-Air Furnace	48.3%	2.1%	75.5%	4.4%	48.5%	2.1%
Central Boiler[a,b]	42.9%	2.2%	15.3%	4.1%	42.7%	2.1%
Baseboard Electric Heat[a,b]	2.0%	0.5%	1.5%	0.8%	2.0%	0.5%
Other	1.4%▼	0.5%	0.9%▼	0.6%	1.4%▼	0.5%
Heating Stove Burning Wood or Coal[b]	1.3%	0.4%	0.3%	0.3%	1.3%	0.4%
Air Source Heat Pump	1.2%	0.4%	1.3%	0.7%	1.2%	0.4%
District Steam	1.1%	0.5%	0.0%	0.0%	1.1%	0.5%
Ground Source Heat Pump	0.8%	0.4%	3.2%▼	1.1%	0.8%	0.4%
Ductless Mini-Split Heat Pump[b]	0.4%	0.2%	1.3%	1.5%	0.4%	0.2%
Wood Pellet Stove[b]	0.4%	0.2%	0.6%	0.5%	0.4%	0.2%
Fireplace	0.2%▼	0.1%	0.1%	0.2%	0.2%▼	0.1%
Portable Electric Heater	0.1%	0.1%	0.0%	0.0%	0.1%▼	0.1%
Respondents (n)	1,791	1,791	575	575	2,366	2,366

[a] *The apparent increase in central boilers and decrease in baseboard electric heat results from a large percentage of boiler systems characterized by participants as baseboard heating in the 2015 RSBS.*
[b] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for central boiler, baseboard electric heat, heating stove burning wood or coal, ductless mini-split heat pump, or wood pellet stove.*

Source: Survey fields: ['Primary Heating System Type', 'Construction Type'].

BACK TO REPORT

TABLE 39. PRIMARY HEATING FUEL BY CLIMATE ZONE (SURVEY AND SITE)

COMPARE WITH TABLE 7, VOLUME 1, IN 2015 RSBS.

Fuel	Web and Telephone Surveys								Site Visits	
	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Natural Gas	67.4%▲	3.4%	72.4%▲	2.4%	41.2%▲	4.0%	65.2%▲	2.0%	71.2%▲	4.5%
Fuel Oil	26.2%▼	3.2%	10.2%▼	1.7%	19.8%	3.3%	19.3%▼	1.7%	21.0%	4.3%
Electricity	4.0%	1.4%	8.5%	1.5%	12.9%▲	2.7%	7.0%	1.0%	1.8%	1.0%
Propane	0.2%▼	0.3%	5.7%▼	1.3%	13.4%	2.8%	4.3%▼	0.7%	4.5%	1.6%
Wood/Wood Pellets	0.0%	0.0%	2.3%▼	0.8%	8.0%▼	2.2%	2.1%▼	0.5%	1.1%▼	0.8%
District Steam	2.0%▲	1.0%	0.7%	0.4%	0.2%	0.4%	1.2%▲	0.5%	0.0%	0.0%
Kerosene	0.0%	0.0%	0.2%	0.3%	2.5%▼	1.3%	0.5%▼	0.2%	0.2%	0.4%
Other	0.2%	0.3%	0.0%▼	0.0%	1.7%	1.1%	0.4%▼	0.2%	0.2%	0.3%
Solar	0.0%	0.0%	0.0%▼	0.0%	0.2%	0.4%	0.0%	0.1%	0.0%	0.0%
Respondents (n)	542	542	1,313	1,313	522	522	2,377	2,377	422	422

Source: Survey fields: ['Primary Fuel Type', 'Climate Zone'], On-site fields: ['HVAC Heating Fuel Type', 'Climate Zone'].

BACK TO REPORT

TABLE 40. EXISTING HOMES: PRIMARY HEATING FUEL BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 18, VOLUME 1, IN 2015 RSBS.

Primary Fuel Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Natural Gas	67.3%▲	3.4%	72.4%▲	2.5%	41.3%▲	4.1%	65.2%▲	2.0%
Fuel Oil	26.3%▼	3.2%	10.3%	1.7%	19.9%	3.3%	19.4%▼	1.8%
Electricity	4.0%	1.4%	8.5%	1.5%	12.8%▲	2.8%	7.0%	1.0%
Propane	0.2%▼	0.3%	5.6%▼	1.3%	13.1%	2.8%	4.2%▼	0.7%
Wood	0.0%	0.0%	1.7%	0.7%	6.5%	2.0%	1.6%	0.4%
Wood Pellets	0.0%	0.0%	0.7%	0.4%	1.5%	1.0%	0.5%	0.2%
Kerosene	0.0%	0.0%	0.2%	0.3%	2.5%▼	1.3%	0.5%▼	0.2%
District Steam	2.0%▲	1.0%	0.7%	0.4%	0.3%	0.4%	1.2%▲	0.5%
Other	0.2%	0.3%	0.0%	0.0%	1.8%	1.1%	0.4%▼	0.2%
Solar	0.0%	0.0%	0.0%	0.0%	0.3%	0.4%	0.0%	0.1%
Respondents (n)	505	505	896	896	397	397	1,798	1,798

Source: Survey fields: ['Primary Fuel Type', 'Climate Zone'].

TABLE 41. NEW HOMES: PRIMARY HEATING FUEL BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 19, VOLUME 1, IN 2015 RSBS.

Primary Fuel Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Natural Gas	86.5%▲	9.5%	65.7%	3.8%	23.2%	6.3%	64.3%▲	4.3%
Propane	2.7%▼	4.5%	18.7%	3.2%	48.0%	7.4%	19.1%	3.0%
Electricity	8.1%	7.6%	12.9%▲	2.7%	18.4%	5.7%	12.4%▲	3.0%
Fuel Oil	2.7%▼	4.5%	0.5%▼	0.6%	4.8%	3.2%	2.0%▼	1.6%
Wood Pellets	0.0%	0.0%	0.5%	0.6%	3.2%	2.6%	0.8%	0.6%
Wood	0.0%	0.0%	0.5%	0.6%	2.4%	2.3%	0.7%	0.5%
Solar	0.0%	0.0%	1.0%	0.8%	0.0%	0.0%	0.5%	0.4%
Other	0.0%	0.0%	0.2%	0.4%	0.0%	0.0%	0.1%	0.2%
Respondents (n)	37	37	417	417	125	125	579	579

Source: Survey fields: ['Primary Fuel Type', 'Climate Zone'].

TABLE 42. EXISTING HOMES: PRIMARY HEATING SYSTEM AGE BY PRIMARY HEATING FUEL (SURVEY)

COMPARE WITH TABLE 20, VOLUME 1, IN 2015 RSBS.

Age of Heating System	Natural Gas		Oil		Electricity		Propane		Other		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	9.6%▼	1.6%	3.4%▼	1.9%	9.0%	4.2%	5.4%	3.9%	4.1%	3.3%	8.0%▼	1.2%
2 to 4 Years	11.0%▼	1.7%	8.1%	2.9%	18.7%	5.9%	12.5%	5.6%	9.6%▼	5.8%	11.0%▼	1.3%
5 to 9 Years	22.9%	2.2%	15.4%▼	3.9%	24.1%	6.9%	27.4%	7.6%	27.4%	8.5%	21.9%	1.8%
10 to 14 Years	21.3%▲	2.2%	18.4%	4.2%	12.5%	5.2%	29.6%▲	7.8%	17.1%	7.4%	20.3%▲	1.8%
15 to 19 Years	11.1%	1.7%	16.9%	3.9%	10.2%	5.2%	6.3%	4.1%	12.4%	7.3%	12.0%▲	1.4%
20 or More Years	24.0%▲	2.4%	37.7%▲	5.2%	25.7%	6.3%	18.9%	6.7%	29.5%	8.7%	26.8%▲	2.0%
Respondents (n)	1,083	1,083	283	283	134	134	95	95	84	84	1,679	1,679

Source: Survey fields: ['Age of Primary Heating System', 'Primary Fuel Type'].

TABLE 43. EXISTING HOMES: PRIMARY HEATING SYSTEM TYPE BY PRIMARY HEATING FUEL (SURVEY)

COMPARE WITH TABLE 21, VOLUME 1, IN 2015 RSBS.

Fuel Type	Natural Gas		Oil		Electricity		Propane		Other		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Central Forced-Air Furnace	59%	3%	26%	4%	33%	7%	59%	8%	10%▼	5%	49%	2%
Central Boiler[a, b]	41%▲	3%	72%▲	4%	0%	0%	36%▲	8%	13%	6%	42%▲	2%
Baseboard Electric Heat[a, b]	0%	0%	0%	0%	28%	6%	0%	0%	0%	0%	2%▼	1%
Other	0%▼	0%	2%	2%	4%	3%	3%▼	3%	8%	5%	1%▼	0%
Air Source Heat Pump	0%	0%	0%	0%	17%▲	6%	0%	0%	0%	0%	1%	0%
Heating Stove Burning Wood[b]	0%	0%	0%	0%	0%	0%	0%	0%	28%	8%	1%	0%
District Steam	0%	0%	0%	0%	0%	0%	0%	0%	27%▲	10%	1%	0%
Ground Source Heat Pump	0%	0%	0%	0%	11%▲	5%	0%	0%	0%	0%	1%	0%
Ductless Mini-Split Heat Pump[b]	0%	0%	0%	0%	6%	3%	0%	0%	0%	0%	0%	0%
Wood Pellet Stove[b]	0%	0%	0%	0%	0%	0%	0%	0%	10%	5%	0%	0%
Fireplace	0%	0%	0%	0%	0%	0%	2%	2%	1%	2%	0%▼	0%
Heating Stove Burning Coal[b]	0%	0%	0%	0%	0%	0%	0%	0%	4%	3%	0%	0%
Portable Electric Heater	0%	0%	0%	0%	1%▼	1%	0%	0%	0%	0%	0%▼	0%
Respondents (n)	1,140	1,140	302	302	146	146	96	96	89	89	1,773	1,773

[a] *The apparent increase in central boilers and decrease in baseboard electric heat appears to result from a large percentage of boiler systems characterized by participants as baseboard heating in the 2015 RSBS.*
[b] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for central boiler, baseboard electric heat, heating stove burning wood or coal, ductless mini-split heat pump, wood pellet stove, or heating stove burning coal.*

Source: Survey fields: ['Primary Heating System Type', 'Primary Fuel Type'].

BACK TO REPORT

TABLE 44. NEW HOMES: PRIMARY HEATING SYSTEM TYPE BY PRIMARY HEATING FUEL (SURVEY)
COMPARE WITH TABLE 22, VOLUME 1, IN 2015 RSBS.

Fuel Type	Natural Gas		Propane		Electricity		Other		Oil		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Central Forced-Air Furnace	84.6%	6.2%	70.6%	6.9%	41.7%	13.0%	40.1%	22.1%	77.4%	44.0%	75.4%	4.5%
Steam/Hot Water Boiler	14.7%▲	6.2%	27.3%▲	6.7%	0.0%	0.0%	12.7%	15.4%	22.6%	44.0%	15.3%▲	4.2%
Ground Source Heat Pump	0.0%	0.0%	0.0%	0.0%	25.2%▲	8.8%	0.0%	0.0%	0.0%	0.0%	3.2%▼	1.1%
Baseboard Electric Heat	0.0%	0.0%	0.0%	0.0%	11.8%▼	6.2%	0.0%	0.0%	0.0%	0.0%	1.5%▼	0.8%
Air Source Heat Pump	0.0%	0.0%	0.0%	0.0%	10.3%	5.5%	0.0%	0.0%	0.0%	0.0%	1.3%	0.7%
Ductless Mini-Split Heat Pump[a]	0.0%	0.0%	0.0%	0.0%	10.1%	11.1%	0.0%	0.0%	0.0%	0.0%	1.3%	1.5%
Other	0.5%	0.6%	2.1%▼	2.0%	0.9%▼	1.6%	5.5%	9.7%	0.0%	0.0%	0.9%▼	0.6%
Wood Pellet Stove[a]	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	29.0%	21.6%	0.0%	0.0%	0.6%	0.5%
Heating Stove Burning Wood[a]	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.7%	15.4%	0.0%	0.0%	0.3%	0.3%
Fireplace[a]	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Respondents (n)	332	332	134	134	80	80	16	16	8	8	570	570

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for ductless mini-split heat pump, wood pellet stove, heating stove burning wood, or fireplace.*

Source: Survey fields: ['Primary Heating System Type', 'Primary Fuel Type'].

TABLE 45. PRIMARY HEATING FUEL BY DWELLING UNIT TYPE (SURVEY)

COMPARE WITH TABLE 23, VOLUME 1, IN 2015 RSBS.

Fuel Type	Single-Family Detached House		Single-Family Attached House		Mobile or Manufactured Home		Multi-Unit Building or Condominium		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Natural Gas	63.5%▲	2.1%	89.2%▲	4.6%	6.7%▼	6.9%	78.7%	15.7%	65.2%▲	2.0%
Fuel Oil	20.8%▼	1.9%	4.0%▼	3.1%	29.5%	14.2%	7.9%	12.7%	19.3%▼	1.7%
Propane	4.1%▼	0.7%	0.5%	0.8%	38.1%	13.9%	3.2%	5.4%	4.3%▼	0.7%
Electricity	7.0%▲	1.0%	6.3%	3.5%	11.9%	9.0%	10.2%	9.9%	7.0%	1.0%
Wood[a]	1.8%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	0.4%
District Steam	1.4%▲	0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.2%▲	0.5%
Kerosene	0.4%▼	0.2%	0.0%	0.0%	11.1%	8.8%	0.0%	0.0%	0.5%▼	0.2%
Wood Pellets[a]	0.5%	0.2%	0.0%	0.0%	2.8%	4.6%	0.0%	0.0%	0.5%	0.2%
Other	0.4%▼	0.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%▼	0.2%
Solar	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
Respondents (n)	2,133	2,133	155	155	60	60	29	29	2,377	2,377

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for wood or wood pellets.*

Source: Survey fields: ['Home Description', 'Primary Fuel Type'].

TABLE 46. EFFICIENCY OF BOILERS AND FURNACES BY FUEL TYPE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

AFUE	Gas[a]		Oil		Overall Statewide	
	%	EB	%	EB	%	EB
60 to 69	0.2%	0.4%	3.5%	4.6%	1.0%	1.1%
70 to 79	2.1%	1.6%	7.2%	5.5%	3.2%	1.7%
80 to 84	52.8%	5.7%	47.4%	12.2%	51.6%	5.2%
85 to 89	5.4%	3.1%	41.9%	12.1%	13.5%	3.9%
90 to 94	20.1%	4.3%	0.0%	0.0%	15.6%	3.4%
95 and above	19.4%	3.8%	0.0%	0.0%	15.1%	3.0%
Respondents (n)	326	326	61	61	387	387

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

[a] *As defined for this table, gas includes natural gas and propane.*

Source: On-site fields: ['Rated Heating Efficiency', 'HVAC Heating Fuel Type', 'HVAC System Type'].

TABLE 47. FURNACE EFFICIENCY BY EQUIPMENT AGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

AFUE	Manufactured in 2000 or Later		Manufactured before 2000		Overall Statewide	
	%	EB	%	EB	%	EB
70 to 79	1.1%	1.3%	7.4%	6.1%	2.7%	1.8%
80 to 84	23.0%	7.6%	71.0%	12.4%	34.8%	6.9%
85 to 89	4.1%	4.1%	1.7%	2.9%	3.5%	3.2%
90 to 94	32.4%	7.2%	18.1%	11.1%	28.9%	6.1%
95 and above	39.3%	7.2%	1.8%	2.9%	30.1%	5.7%
Respondents (n)	192	192	45	45	237	237

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Rated Heating Efficiency', 'HVAC System Year Manufactured', 'HVAC System Type', 'HVAC Heating Fuel Type'].

TABLE 48. BOILER EFFICIENCY BY EQUIPMENT AGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

AFUE	Manufactured in 2000 or Later		Manufactured before 2000		Overall Statewide	
	%	EB	%	EB	%	EB
60 to 69	0.6%	1.0%	3.6%	4.7%	1.8%	2.0%
70 to 79	2.5%	3.2%	5.3%	5.1%	3.6%	2.8%
80 to 84	60.0%	9.9%	73.1%	10.9%	65.2%	7.3%
85 to 89	23.8%	8.8%	18.1%	9.6%	21.5%	6.5%
90 to 94	8.2%	5.0%	0.0%	0.0%	4.9%	3.0%
95 and above	4.9%	3.7%	0.0%	0.0%	2.9%	2.2%
Respondents (n)	90	90	60	60	150	150

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Rated Heating Efficiency', 'HVAC System Year Manufactured', 'HVAC System Type', 'HVAC Heating Fuel Type'].

TABLE 49. HEATING SYSTEM ENERGY STAR RATED BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 44, VOLUME 5, IN 2015 RSBS.

ENERGY STAR Heating	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	85.3%	5.5%	86.3%▲	3.3%	73.3%	7.2%	84.0%▲	2.9%
No	14.7%	5.5%	13.7%▼	3.3%	26.7%	7.2%	16.0%▼	2.9%
Respondents (n)	134	134	569	569	172	172	875	875

Source: Survey fields: ['Energy Star Primary Heat System', 'Climate Zone'].

TABLE 50. HEATING SYSTEM ENERGY STAR RATED BY HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 45, VOLUME 5, IN 2015 RSBS.

ENERGY STAR Heating	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Yes	83.8%▲	2.9%	92.1%	2.2%	84.0%▲	2.9%
No	16.2%▼	2.9%	7.9%	2.2%	16.0%▼	2.9%
Respondents (n)	504	504	371	371	875	875

Source: Survey fields: ['Energy Star Primary Heat System', 'Construction Type'].

TABLE 51. AVERAGE NUMBER OF FIREPLACES BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 42, VOLUME 5, IN 2015 RSBS.

Fireplaces	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Wood	0.2	0.0	0.2	0.0	0.2	0.0	0.2	0.0
Natural Gas	0.1	0.0	0.2▲	0.0	0.1	0.0	0.1▲	0.0
Propane	0.0	0.0	0.0▲	0.0	0.1	0.0	0.0▲	0.0
Electric	0.1▲	0.0	0.1	0.0	0.1	0.0	0.1	0.0
Respondents (n)	494	494	1,199	1,199	484	484	2,177	2,177

Source: Survey fields: ['No. of Wood Fireplaces', 'No. of Gas Fireplaces', 'No. of Propane Fireplaces', 'No. of Electric Fireplaces', 'Climate Zone'].

TABLE 52. AVERAGE NUMBER OF FIREPLACES BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 43, VOLUME 5, IN 2015 RSBS.

Fireplaces	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Wood	0.22	0.02	0.11▼	0.04	0.22	0.02
Natural Gas	0.15▲	0.02	0.40	0.06	0.15▲	0.02
Propane	0.03▲	0.01	0.09	0.03	0.03▲	0.01
Electric	0.10	0.02	0.25	0.20	0.10	0.02
Respondents (n)	1,651	1,651	526	526	2,177	2,177

Source: Survey fields: ['No. of Wood Fireplaces', 'No. of Gas Fireplaces', 'No. of Propane Fireplaces', 'No. of Electric Fireplaces', 'Construction Type'].

TABLE 53. AVERAGE NUMBER OF OTHER HEATING SOURCES BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 46, VOLUME 5, IN 2015 RSBS.

Other Heat Source	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Heat Stove[a]	0.04	0.02	0.10	0.02	0.17	0.03	0.08	0.01
Portable Electric Heater	0.33	0.06	0.36	0.04	0.46	0.07	0.36	0.03
Portable Kerosene Heater	0.00	0.01	0.01	0.01	0.01	0.01	0.01▲	0.00
Pellet Stove[a]	0.00	0.01	0.03	0.01	0.05	0.02	0.02	0.01
Respondents (n)	447	447	1,039	1,039	427	427	1,913	1,913

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for heat stove or pellet stove.*

Source: Survey fields: ['Number of Heat Stoves in Winter', 'Number of Electric Heaters', 'Number of Kerosene Heaters', 'Number of Pellet Stoves', 'Climate Zone'].

TABLE 54. AVERAGE NUMBER OF OTHER HEATING SOURCES BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 47, VOLUME 5, IN 2015 RSBS.

Other Heat Source	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Heat Stove[a]	0.08	0.01	0.04	0.01	0.08	0.01
Portable Electric Heater	0.36	0.03	0.22	0.08	0.36	0.03
Portable Kerosene Heater	0.01▲	0.00	0.00	0.00	0.01▲	0.00
Pellet Stove[a]	0.02	0.01	0.02	0.01	0.02	0.01
Respondents (n)	1,489	1,489	424	424	1,913	1,913

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for heat stove or pellet stove.*

Source: Survey fields: ['Number of Heat Stoves in Winter', 'Number of Electric Heaters', 'Number of Kerosene Heaters', 'Number of Pellet Stoves', 'Construction Type'].

TABLE 55. HEATING SYSTEM TUNE-UP BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 24, VOLUME 1, IN 2015 RSBS.

Tune-Up Conducted	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes, by a Heating Contractor	57.9%	3.6%	44.2%	2.7%	42.7%▼	4.1%	50.5%	2.1%
No	32.3%	3.4%	41.3%	2.7%	40.1%▲	4.0%	36.8%	2.0%
Yes, by Someone in the Household	9.5%	2.1%	13.4%	1.9%	15.8%	3.0%	11.9%	1.3%
Yes, by Landlord	0.4%▼	0.5%	1.1%▼	0.6%	1.5%	1.0%	0.8%▼	0.3%
Respondents (n)	533	533	1,283	1,283	520	520	2,336	2,336

Source: Survey fields: ['Annual Tune Up Heating System', 'Climate Zone'].

TABLE 56. COOLING EQUIPMENT PRESENCE AND TYPE BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 25, VOLUME 1, IN 2015 RSBS.

Primary Cooling Equipment	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Central Air Conditioning System	47.0%▲	3.6%	53.1%▲	2.7%	20.1%	3.2%	45.1%▲	2.1%
Room or Window Air Conditioner	43.4%▼	3.6%	30.9%▼	2.5%	52.3%	4.0%	40.2%▼	2.1%
No Air Conditioning	3.7%▼	1.4%	12.2%▼	1.8%	22.1%▼	3.4%	9.7%▼	1.1%
Heat Pump	5.5%▲	1.7%	3.5%▲	1.0%	5.2%▲	1.8%	4.7%▲	0.9%
Other	0.4%	0.5%	0.3%	0.3%	0.2%	0.4%	0.3%	0.3%
Respondents (n)	549	549	1,330	1,330	532	532	2,411	2,411

Note: Reports type of primary cooling equipment.

Source: Survey fields: ['Primary Air Conditioning Type', 'Air Conditioning in Home', 'Climate Zone'].

BACK TO REPORT

TABLE 57. COOLING EQUIPMENT PRESENCE AND TYPE BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 26, VOLUME 1, IN 2015 RSBS.

Primary Cooling Equipment	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Central Air Conditioning System	44.9%▲	2.1%	76.9%	3.6%	45.1%▲	2.1%
Room or Window Air Conditioner	40.4%▼	2.1%	11.0%▲	2.4%	40.2%▼	2.1%
No Air Conditioning	9.7%▼	1.1%	7.1%▼	2.4%	9.7%▼	1.1%
Heat Pump	4.7%▲	0.9%	4.9%	1.8%	4.7%▲	0.9%
Other	0.3%	0.3%	0.0%	0.0%	0.3%	0.3%
Respondents (n)	1,827	1,827	584	584	2,411	2,411

Note: Reports type of primary cooling equipment.

Source: Survey fields: ['Primary Air Conditioning Type', 'Air Conditioning in Home', 'Construction Type'].

TABLE 58. COOLING EQUIPMENT PRESENCE AND TYPE BY DWELLING UNIT TYPE (SURVEY)

COMPARE WITH TABLE 27, VOLUME 1, IN 2015 RSBS.

Primary Cooling Equipment	Single-Family Detached House		Single-Family Attached House		Mobile or Manufactured Home		Multi-Unit Building or Condominium		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Central Air Conditioning System	46.4%▲	2.2%	39.0%	7.8%	37.1%	14.5%	18.3%	12.2%	45.1%▲	2.1%
Room or Window Air Conditioner	38.7%▼	2.2%	49.5%	8.0%	43.4%	14.3%	62.8%	14.4%	40.2%▼	2.1%
No Air Conditioning	9.8%▼	1.2%	5.4%▼	3.4%	19.6%	11.1%	18.9%	10.2%	9.7%▼	1.1%
Heat Pump	4.8%▲	1.0%	5.7%	3.8%	0.0%	0.0%	0.0%	0.0%	4.7%▲	0.9%
Other	0.3%▼	0.3%	0.5%	0.8%	0.0%	0.0%	0.0%	0.0%	0.3%	0.3%
Respondents (n)	2,152	2,152	156	156	61	61	42	42	2,411	2,411

Note: Reports type of primary cooling equipment.

Source: Survey fields: ['Home Description', 'Primary Air Conditioning Type', 'Air Conditioning in Home'].

TABLE 59. PERCENTAGE OF CONDITIONED SPACE MECHANICALLY COOLED BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 162, VOLUME 5, IN 2015 RSBS.

Space Cooled (%)	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
10	0.0%	0.0%	0.6%▼	1.0%	4.4%	5.1%	0.9%▼	0.9%
20	2.8%▼	3.2%	4.9%▼	2.8%	8.9%	7.0%	4.5%▼	2.1%
30	1.4%▼	2.3%	1.8%▼	1.7%	4.4%	5.1%	2.0%▼	1.5%
40	4.2%	3.9%	3.1%	2.2%	4.4%	5.1%	3.8%	2.2%
50	18.1%	7.6%	9.2%	3.8%	15.4%	9.0%	14.3%	4.0%
60	1.4%	2.3%	2.5%	2.0%	4.4%	5.1%	2.3%	1.5%
70	11.1%▲	6.2%	1.2%	1.4%	0.0%	0.0%	5.7%	3.0%
80	1.4%	2.3%	1.2%	1.4%	2.2%	3.6%	1.5%	1.3%
90	5.6%	4.5%	0.7%	1.0%	0.1%▼	0.1%	2.9%	2.1%
100	54.2%▲	9.8%	74.7%▲	5.6%	55.8%▲	12.3%	62.1%▲	5.4%
Respondents (n)	72	72	225	225	57	57	354	354

Note: For mechanically cooled homes, this tables provides an average of the percentage of the living area conditioned by primary cooling systems.

Source: On-site fields: ['HVAC Cooling Percentage of Conditioned Space', 'Climate Zone'].

TABLE 60. PERCENTAGE OF CONDITIONED SPACE MECHANICALLY COOLED BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 163, VOLUME 5, IN 2015 RSBS.

Space Cooled (%)	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
10	0.9%▼	0.9%	0.0%	0.0%	0.9%▼	0.9%
20	4.6%▼	2.2%	2.3%	3.8%	4.5%▼	2.1%
30	2.0%▼	1.5%	0.0%	0.0%	2.0%▼	1.5%
40	3.8%	2.2%	0.0%	0.0%	3.8%	2.2%
50	14.4%	4.1%	0.0%	0.0%	14.3%	4.0%
60	2.3%	1.5%	1.1%	1.9%	2.3%	1.5%
70	5.7%	3.0%	1.1%	1.9%	5.7%	3.0%
80	1.5%	1.3%	0.0%	0.0%	1.5%	1.3%
90	2.8%	2.1%	5.7%	4.9%	2.9%	2.1%
100	62.0%▲	5.5%	89.7%	6.5%	62.1%▲	5.4%
Respondents (n)	278	278	76	76	354	354

Note: For mechanically cooled homes, this table provides an average of the percentage of the living area conditioned by primary cooling systems.

Source: On-site fields: ['HVAC Cooling Percentage of Conditioned Space', 'Construction Type'].

TABLE 61. PRIMARY COOLING EQUIPMENT AGE BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 28, VOLUME 1, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	15.1%	2.7%	13.6%	2.0%	18.6%	3.7%	15.0%	1.6%
2 to 4 Years	18.1%▼	2.9%	19.5%▼	2.4%	27.7%	4.2%	19.9%▼	1.8%
5 to 9 Years	27.8%	3.4%	30.8%	2.8%	29.7%	4.3%	29.1%	2.1%
10 to 14 Years	19.6%▲	3.0%	19.3%	2.4%	12.0%	3.1%	18.5%	1.8%
15 to 19 Years	11.0%▲	2.4%	9.1%▲	1.7%	6.0%	2.3%	9.6%▲	1.4%
20 or More Years	8.4%	2.1%	7.8%	1.6%	6.0%	2.3%	7.8%▲	1.3%
Respondents (n)	498	498	1,136	1,136	396	396	2,030	2,030

Source: Survey fields: ['Age of Primary Air Conditioning', 'Climate Zone'].

TABLE 62. COOLING EQUIPMENT AGE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 29, VOLUME 1, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	5.1%▼	3.2%	11.3%▼	4.0%	7.9%	5.2%	7.1%▼	2.3%
2 to 4 Years	8.8%	4.5%	11.6%	4.5%	17.1%	8.8%	10.6%	3.2%
5 to 9 Years	33.6%	8.9%	22.8%	5.3%	49.2%	12.7%	32.8%	5.8%
10 to 14 Years	22.6%	8.9%	23.7%	5.5%	11.6%	6.9%	21.5%	5.7%
15 to 19 Years	15.3%	8.6%	12.7%	4.0%	5.2%	4.3%	13.3%	5.3%
20 or More Years	14.6%	6.6%	17.9%	4.7%	9.1%	6.3%	14.8%	4.2%
Systems (n)	137	137	240	240	89	89	466	466

Note: This table represents age of all space cooling systems, whether used as primary or secondary cooling equipment.

Source: On-site fields: ['HVAC System Year Manufactured', 'Number of HVAC Systems', 'Climate Zone'].

TABLE 63. PRIMARY COOLING EQUIPMENT TYPE BY HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 30, VOLUME 1, IN 2015 RSBS.

Primary Cooling Equipment	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Central Air Conditioning System	49.7%▲	2.2%	82.8%	3.2%	49.9%▲	2.2%
Room or Window Air Conditioner	44.7%▼	2.2%	11.9%▲	2.6%	44.5%▼	2.2%
Heat Pump	5.2%▲	1.0%	5.3%	2.0%	5.2%▲	1.0%
Other	0.4%	0.3%	0.0%	0.0%	0.4%	0.3%
Respondents (n)	1,606	1,606	542	542	2,148	2,148

Source: Survey fields: ['Primary Air Conditioning Type', 'Construction Type'].

TABLE 64. COOLING EQUIPMENT AGE BY COOLING SYSTEM TYPE (SITE)

COMPARE WITH TABLE 31, VOLUME 1, IN 2015 RSBS.

Age	Central AC		Room Window AC		Ductless Mini-Split Heat Pump[a]		Room Sleeve AC		Room Free-Standing AC		Ground Source Heat Pump		Air Source Heat Pump		Mini-Split AC		Ducted Mini-Split Heat Pump[a]		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	11.6%	4.5%	6.3%▼	3.1%	15.4%	12.2%	0.0%	0.0%	0.0%	0.0%	61.3%	42.3%	22.6%	40.3%	0.0%	0.0%	0.0%	0.0%	8.7%▼	2.4%
2 to 4 Years	8.3%	4.7%	10.0%	4.4%	19.0%	12.4%	11.1%	11.4%	38.1%	25.1%	7.1%	7.0%	0.2%	0.5%	44.1%	0.0%	100.0%	0.0%	11.6%	3.0%
5 to 9 Years	20.6%	6.0%	44.5%	9.4%	51.1%	18.5%	24.3%	21.4%	48.1%	27.3%	31.6%	43.2%	25.3%	30.3%	11.9%	0.0%	0.0%	0.0%	34.9%▲	5.4%
10 to 14 Years	22.2%	5.9%	17.8%	5.8%	12.0%	10.2%	40.5%	32.8%	3.7%	6.7%	0.0%	0.0%	35.3%	42.0%	11.9%	0.0%	0.0%	0.0%	20.2%	4.8%
15 to 19 Years	16.7%	5.3%	9.6%	9.2%	2.6%	4.4%	12.2%	12.7%	10.0%	17.0%	0.0%	0.0%	0.0%	0.0%	32.2%	0.0%	0.0%	0.0%	11.5%	4.4%
20 or More Years	20.6%	5.6%	11.9%	6.7%	0.0%	0.0%	11.9%	11.9%	0.0%	0.0%	0.0%	0.0%	16.7%	24.8%	0.0%	0.0%	0.0%	0.0%	13.1%	3.5%
System Type (n)	229	229	188	188	52	52	27	27	17	17	17	17	10	10	5	5	2	2	547	547

Note: This table includes primary and secondary cooling systems.
[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for ductless mini-split heat pump or ducted mini-split heat pump.*

Source: On-site fields: ['HVAC System Year Manufactured', 'Number of HVAC Systems', 'HVAC System Type'].

TABLE 65. COOLING EQUIPMENT TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 32, VOLUME 1, IN 2015 RSBS.

Cooling Equipment	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Room Window Air Conditioner	45.0%	8.2%	35.5%	6.0%	72.0%	10.2%	46.5%	5.4%
Central Air Conditioner	22.7%▼	5.5%	48.4%	5.9%	10.7%	5.7%	27.4%▼	4.0%
Room Sleeve Air Conditioner	19.0%	7.2%	2.1%	1.6%	1.1%	1.9%	12.2%	4.6%
Ductless Mini-Split Heat Pump[a]	9.5%	4.3%	6.1%	3.2%	7.0%	6.8%	8.3%	2.9%
Room Free-Standing Air Conditioner	1.9%	1.6%	3.0%	2.1%	6.9%	6.3%	2.9%	1.4%
Air Source Heat Pump	0.9%▼	1.1%	2.2%	1.6%	1.1%	1.9%	1.3%	0.8%
Ground Source Heat Pump	0.0%	0.0%	1.4%	1.2%	1.2%	1.9%	0.5%▼	0.4%
Mini-Split Air Conditioner	0.9%▼	1.1%	1.3%	1.2%	0.0%	0.0%	0.9%▼	0.7%
Ducted Mini-Split Heat Pump[a]	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Systems (n)	211	211	310	310	104	104	625	625

Note: This table includes primary and secondary cooling systems.
[a] Comparisons cannot be made with the corresponding table in the 2015 RSBS for ductless mini-split heat pump or ducted mini-split heat pump.

Source: On-site fields: ['Number of HVAC Systems', 'HVAC System Type', 'Climate Zone'].

TABLE 66. COOLING EQUIPMENT TYPE BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 33, VOLUME 1, IN 2015 RSBS.

Cooling Equipment	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Room Window Air Conditioner	46.6%	5.4%	3.7%	5.9%	46.5%	5.4%
Central Air Conditioner	27.3%	4.0%	65.1%	9.4%	27.4%▼	4.0%
Room Sleeve Air Conditioner	12.3%	4.6%	0.0%	0.0%	12.2%	4.6%
Ductless Mini-Split Heat Pump[a]	8.3%	2.9%	14.3%	7.0%	8.3%	2.9%
Air Source Heat Pump	1.3%	0.8%	1.8%	2.1%	1.3%	0.8%
Ground Source Heat Pump	0.5%	0.4%	13.4%	6.1%	0.5%▼	0.4%
Mini-Split Air Conditioner	0.9%	0.7%	0.0%	0.0%	0.9%▼	0.7%
Room Free-Standing Air Conditioner	2.9%	1.4%	0.0%	0.0%	2.9%	1.4%
Ducted Mini-Split Heat Pump[a]	0.0%	0.0%	1.8%	2.9%	0.0%	0.0%
Systems (n)	530	530	95	95	625	625

Note: This table includes primary and secondary cooling systems.
[a] Comparisons cannot be made with the corresponding table in the 2015 RSBS for ductless mini-split heat pump or ducted mini-split heat pump .

Source: On-site fields: ['Number of HVAC Systems', 'HVAC System Type', 'Construction Type'].

TABLE 67. CENTRAL AIR CONDITIONER SEER RATING BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 34, VOLUME 1, IN 2015 RSBS.

SEER	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
8 to 8.9	0.0%	0.0%	1.9%	2.2%	12.1%	19.8%	1.2%▼	1.2%
10 to 10.9	16.7%	9.1%	25.6%	7.0%	12.1%	19.8%	20.0%	5.9%
11 to 11.9	0.0%	0.0%	3.8%	3.1%	12.1%	19.8%	2.0%	1.5%
12 to 12.9	14.6%	8.6%	5.7%	3.7%	12.1%	19.8%	11.0%	5.1%
13 to 13.9	27.1%	10.9%	42.4%▲	7.9%	25.9%	25.9%	33.1%	7.0%
14 to 14.9	20.8%	10.6%	11.0%	4.9%	24.5%	25.9%	17.1%	6.4%
15 to 15.9	12.5%	8.1%	3.0%	2.7%	1.0%	1.2%	8.3%	4.7%
16 to 16.9	6.3%	5.9%	6.7%	4.0%	0.3%	0.6%	6.2%	3.6%
17 to 17.9	2.1%	3.5%	0.0%	0.0%	0.0%	0.0%	1.2%	1.9%
18 to 18.9	0.0%	NA	0.0%	NA	0.0%	NA	0.0%	NA
Systems (n)	48	48	156	156	18	18	222	222

Note: Presents SEER for central air conditioner equipment only. Does not include SEER for heat pump equipment or other air conditioning units.

Source: On-site fields: ['Rated Cooling Efficiency', 'Number of HVAC Systems', 'Climate Zone'].

TABLE 68. NEW HOMES: CENTRAL AIR CONDITIONER SEER RATING BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

SEER	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
12 to 12.9	**0.0%**	**0.0%**	1.9%	3.2%	0.0%	0.0%	1.6%	2.6%
13 to 13.9	**12.5%**	**23.3%**	46.2%	11.7%	50.0%	29.6%	46.9%	10.7%
14 to 14.9	**87.5%**	**23.3%**	38.5%	11.4%	10.0%	17.8%	33.1%	10.0%
15 to 15.9	**0.0%**	**0.0%**	9.6%	6.9%	30.0%	27.2%	13.4%	7.5%
16 to 16.9	**0.0%**	**0.0%**	3.8%	4.5%	10.0%	17.8%	5.0%	4.8%
Systems (n)	8	8	52	52	10	10	62	62

Note: Presents SEER for central air conditioner equipment only. Does not include SEER for heat pump equipment or other air conditioning units. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

[a] *Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.*

Source: On-site fields: ['Rated Cooling Efficiency', 'Number of HVAC Systems', 'Climate Zone'].

TABLE 69. CENTRAL AIR CONDITIONER SEER RATING BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 35, VOLUME 1, IN 2015 RSBS.

SEER	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
8 to 8.9	1.2%▼	1.2%	0.0%	0.0%	1.2%▼	1.2%
10 to 10.9	20.2%	5.9%	0.0%	0.0%	20.0%	5.9%
11 to 11.9	2.0%	1.5%	0.0%	0.0%	2.0%	1.5%
12 to 12.9	11.0%	5.1%	1.6%	2.6%	11.0%	5.1%
13 to 13.9	33.0%	7.0%	46.9%▼	10.6%	33.1%	7.0%
14 to 14.9	17.0%	6.4%	33.1%▲	10.0%	17.1%	6.4%
15 to 15.9	8.3%	4.7%	13.4%▲	7.4%	8.3%	4.7%
16 to 16.9	6.2%	3.7%	5.0%	4.7%	6.2%	3.6%
17 to 17.9	1.2%	2.0%	0.0%	0.0%	1.2%	1.9%
18 to 18.9	0.0%	NA	0.0%	NA	0.0%	NA
Systems (n)	160	160	62	62	222	222

Note: Presents SEER for central air conditioner equipment only. Does not include SEER for heat pump equipment or other air conditioning units.

Source: On-site fields: ['Rated Cooling Efficiency', 'Number of HVAC Systems', 'Construction Type'].

TABLE 70. CENTRAL AIR CONDITIONER SEER RATING BY EQUIPMENT AGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

SEER	Manufactured 2007 or Later		Manufactured before 2007		Overall Statewide	
	%	EB	%	EB	%	EB
8 to 8.9	0.0%	0.0%	2.4%	2.3%	1.2%	1.2%
10 to 10.9	0.0%	0.0%	39.8%	10.2%	20.2%	5.9%
11 to 11.9	0.0%	0.0%	3.9%	2.9%	2.0%	1.5%
12 to 12.9	0.8%	1.3%	21.0%	9.4%	11.0%	5.1%
13 to 13.9	48.0%	11.3%	18.4%	8.5%	33.0%	7.0%
14 to 14.9	22.7%	11.0%	11.4%	6.3%	17.0%	6.4%
15 to 15.9	14.3%	8.5%	2.3%	3.8%	8.3%	4.7%
16 to 16.9	11.8%	7.2%	0.7%	1.2%	6.2%	3.7%
17 to 17.9	2.4%	4.0%	0.0%	0.0%	1.2%	2.0%
Respondents (n)	71	71	76	76	147	147

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Rated Cooling Efficiency', 'HVAC System Year Manufactured', 'Number of HVAC Systems'].

TABLE 71. ROOM OR WINDOW AIR CONDITIONER EER RATING BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 36, VOLUME 1, IN 2015 RSBS.

EER	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Below 7	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
7 to 7.9	0.9%	1.5%	0.0%	0.0%	0.9%	1.5%
8 to 8.9	9.0%	9.7%	0.0%	0.0%	9.0%	9.7%
9 to 9.9	42.7%	10.9%	0.0%	0.0%	42.7%	10.9%
10 to 10.9	28.8%	8.4%	0.0%	0.0%	28.8%	8.4%
11 to 11.9	13.0%▲	5.9%	0.0%	0.0%	13.0%▲	5.9%
12 to 12.9	5.6%	3.2%	100.0%	0.0%	5.6%	3.2%
Systems (n)	182	182	2	2	184	184

Source: On-site fields: ['Rated Cooling Efficiency', 'Number of Window Units', 'Construction Type'].

TABLE 72. AVERAGE NUMBER OF ROOM OR WINDOW AIR CONDITIONERS BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 48, VOLUME 5, IN 2015 RSBS.

Air Conditioners	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	3.3▲	0.2	2.0	0.1	2.1▲	0.1	2.7▲	0.1
Respondents (n)	244	244	363	363	274	274	881	881

Note: This represents the average number of units only for respondents who reported using room or window air conditioners.

Source: Survey fields: ['Number of Window Units', 'Climate Zone'].

TABLE 73. AVERAGE NUMBER OF ROOM OR WINDOW AIR CONDITIONERS BY HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 49, VOLUME 5, IN 2015 RSBS.

Air Conditioners	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Mean	2.7▲	0.1	1.7	0.2	2.7▲	0.1
Respondents (n)	796	796	85	85	881	881

Note: This represents the average number of units only for respondents who reported using room or window air conditioners.

Source: Survey fields: ['Number of Window Units', 'Construction Type'].

TABLE 74. ROOM OR WINDOW AIR CONDITIONER ENERGY EFFICIENCY RATIO BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 170, VOLUME 5, IN 2015 RSBS.

EER	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
7 to 7.9	1.4%	2.3%	0.0%	0.0%	0.0%	0.0%	0.9%	1.5%
8 to 8.9	10.8%	14.5%	7.4%	6.1%	3.7%	4.4%	9.0%	9.7%
9 to 9.9	39.2%	16.0%	35.2%	12.8%	61.0%	14.1%	42.7%	10.9%
10 to 10.9	31.1%	12.3%	40.7%	13.8%	11.1%▼	7.5%	28.8%	8.4%
11 to 11.9	14.9%▲	8.7%	7.4%	6.1%	11.1%	8.4%	13.0%▲	5.9%
12 to 12.9	2.7%	3.2%	9.3%	6.8%	13.1%	10.4%	5.6%▲	3.2%
Systems (n)	74	74	54	54	56	56	184	184

Source: On-site fields: ['Rated Cooling Efficiency', 'Number of HVAC Systems', 'Climate Zone'].

TABLE 75. ANNUAL AIR CONDITIONER TUNE-UP BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 37, VOLUME 1, IN 2015 RSBS.

Annual Tune-Up	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes, by an Air Conditioning Contractor	54.7%	5.2%	42.8%	3.6%	42.4%	8.3%	48.6%	3.1%
No	38.2%	5.1%	49.5%	3.6%	46.9%	8.4%	43.8%	3.0%
Yes, by Landlord	0.0%	0.0%	0.2%▼	0.3%	0.0%	0.0%	0.1%▼	0.1%
Yes, by Someone in the Household	7.1%	2.7%	7.5%▼	1.9%	10.7%	5.2%	7.5%▼	1.6%
Respondents (n)	276	276	853	853	147	147	1,276	1,276

Source: Survey fields: ['Annual Tune Up Air Conditioning', 'Climate Zone'].

TABLE 76. COOLING SYSTEM YEAR LAST SERVICED BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 166, VOLUME 5, IN 2015 RSBS.

Last Serviced	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
1980 to 1989	0.0%	0.0%	0.7%	1.1%	0.0%	0.0%	0.2%▼	0.3%
1990 to 1999	0.0%	0.0%	0.0%	0.0%	6.8%	6.5%	0.8%▼	0.7%
2000 to 2009	16.5%	12.1%	8.3%▼	3.8%	6.8%▼	6.5%	12.9%	7.4%
2009 to 2014	7.7%▼	5.3%	14.5%▼	4.8%	38.4%▼	16.5%	13.1%▼	4.2%
2015[a]	3.3%	3.1%	7.0%	3.5%	9.2%	7.4%	5.1%	2.3%
2016[a]	14.3%	6.4%	10.5%	4.2%	16.1%	12.4%	13.4%	4.2%
2017[a]	41.8%	10.5%	34.6%	6.6%	6.9%	6.5%	35.7%	6.5%
2018[a]	16.5%	6.8%	24.5%	6.1%	15.8%	9.7%	18.8%	4.6%
Systems (n)	91	91	194	194	53	53	338	338

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for years 2015 through 2018.*

Source: On-site fields: ['When was HVAC System Last Serviced?', 'Number of HVAC Systems', 'Climate Zone'].

TABLE 77. COOLING SYSTEM YEAR LAST SERVICED BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 167, VOLUME 5, IN 2015 RSBS.

Last Serviced	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
1980 to 1989	0.2%▼	0.3%	0.0%	0.0%	0.2%▼	0.3%
1990 to 1999	0.8%▼	0.7%	0.0%	0.0%	0.8%▼	0.7%
2000 to 2009	13.0%	7.4%	0.0%	0.0%	12.9%	7.4%
2009 to 2014	13.2%▼	4.2%	1.6%▼	2.7%	13.1%▼	4.2%
2015[a]	5.0%	2.3%	15.5%	8.0%	5.1%	2.3%
2016[a]	13.3%	4.2%	24.7%	10.2%	13.4%	4.2%
2017[a]	35.8%	6.5%	25.3%	9.6%	35.7%	6.5%
2018[a]	18.8%	4.6%	32.9%	10.3%	18.8%	4.6%
Systems (n)	279	279	59	59	338	338

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for years 2015 through 2018.*

Source: On-site fields: ['When was HVAC System Last Serviced?', 'Number of HVAC Systems', 'Construction Type'].

TABLE 78. COOLING SYSTEM YEAR LAST SERVICED BY YEAR OF MANUFACTURER (SITE) COMPARE WITH TABLE 168, VOLUME 5, IN 2015 RSBS.

Last Serviced	Less than 2 Years Old		2 to 4 Years Old		5 to 9 Years Old		10 to 14 Years Old		15 to 19 Years Old		20+ Years Old		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
1989	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%	2.2%	0.2%	0.3%
1993	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	2.6%	0.3%	0.4%
1995	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%▼	2.6%	0.3%▼	0.4%
1999	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.6%	2.6%	0.3%	0.4%
2000	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	34.2%	34.4%	1.3%	2.2%	5.4%	7.1%
2001	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	2.4%	0.0%	0.0%	0.2%	0.3%
2002	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	5.6%	7.8%	0.0%	0.0%	0.9%	1.1%
2003	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.4%	2.4%	0.0%	0.0%	0.2%	0.3%
2005	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	6.4%	6.1%	0.0%	0.0%	0.0%	0.0%	1.3%▼	1.2%
2006	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	2.5%	0.0%	0.0%	0.0%	0.0%	0.4%▼	0.5%
2007	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%	5.7%	0.0%	0.0%	0.0%	0.0%	0.9%	1.1%
2008	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	15.4%	12.2%	0.0%	0.0%	0.0%	0.0%	3.0%	2.6%
2009	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	4.0%	6.6%	0.6%▼	1.1%
2010	0.0%	0.0%	0.0%	0.0%	10.3%	6.6%	1.0%	1.8%	1.4%▼	2.4%	10.6%	9.5%	5.3%	2.7%
2011	0.0%	0.0%	0.0%	0.0%	4.4%	4.4%	1.0%	1.8%	0.0%	0.0%	0.0%	0.0%	1.6%▼	1.4%
2012	0.0%	0.0%	0.0%	0.0%	3.4%▼	3.7%	0.0%	0.0%	0.0%	0.0%	1.3%▼	2.2%	1.3%▼	1.2%
2013	0.0%	0.0%	0.0%	0.0%	4.7%▼	4.5%	1.0%▼	1.8%	0.0%	0.0%	2.6%▼	3.1%	2.1%▼	1.5%
2014	0.0%	0.0%	11.0%	16.7%	3.1%	3.2%	0.0%	0.0%	1.4%	2.4%	2.6%	3.1%	2.9%	2.4%
2015[a]	0.0%	0.0%	12.1%	8.3%	1.3%	1.6%	8.6%	7.8%	2.7%	3.5%	6.9%	7.3%	5.1%	2.3%
2016[a]	3.5%	5.8%	39.2%	17.6%	11.7%	7.0%	11.9%	9.2%	6.8%	6.1%	9.3%	9.3%	13.4%	4.2%
2017[a]	44.6%	19.3%	25.6%	15.5%	40.5%	12.0%	28.8%	11.9%	36.9%	23.1%	38.1%	14.9%	35.7%	6.5%
2018[a]	51.9%	19.4%	12.0%	8.8%	20.5%	8.7%	19.3%	10.7%	8.3%	8.9%	17.5%	11.4%	18.8%	4.6%
Systems (n)	37	37	74	74	87	87	53	53	39	39	48	48	338	338

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for years 2015 through 2018.*

Source: On-site fields: ['When was HVAC System Last Serviced?', 'HVAC System Year Manufactured', 'Number of HVAC Systems'].

TABLE 79. COOLING SYSTEM YEAR LAST SERVICED BY SYSTEM TYPE (SITE)

COMPARE WITH TABLE 169, VOLUME 5, IN 2015 RSBS.

Year	Central AC		Room Window AC		Ductless Mini-Split Heat Pump		Room Sleeve AC		Ground Source Heat Pump		Air Source Heat Pump		Room Free-Standing AC		Mini-Split AC		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
1980 to 1989	0.5%	0.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.4%	17.7%	0.0%	0.0%	0.0%	0.0%	0.4%	0.4%
1990 to 1999	0.0%	0.0%	1.6%	1.9%	0.0%	0.0%	3.5%	6.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.8%	0.8%
2000 to 2009	6.2%	4.0%	19.4%	14.6%	8.5%	10.0%	18.4%	21.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.6%	6.0%
2009 to 2014	15.1%	6.2%	16.9%	8.1%	0.0%	0.0%	6.1%	10.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	12.3%	3.8%
2015[a]	7.6%	4.2%	3.5%	2.7%	0.2%	0.2%	2.3%	4.1%	2.3%	3.7%	0.0%	0.0%	0.0%	0.0%	11.9%	0.0%	4.6%	2.0%
2016[a]	10.8%	4.8%	17.4%	8.0%	0.0%	0.0%	6.1%	10.7%	1.5%	2.4%	0.2%	0.5%	32.8%	51.1%	0.0%	0.0%	11.4%	3.5%
2017[a]	29.4%	7.0%	31.0%	10.5%	39.7%	20.5%	57.5%	24.9%	33.1%	45.2%	47.6%	41.7%	53.1%	58.2%	88.1%	0.0%	35.3%	5.8%
2018[a]	30.3%	7.3%	10.1%	5.1%	51.6%	20.8%	6.1%	10.7%	63.2%	45.4%	43.8%	41.9%	14.2%	38.9%	0.0%	0.0%	23.6%	4.9%
Systems (n)	197	197	110	110	43	43	18	18	15	15	10	10	8	8	5	5	406	406

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS because of apparent misalignment of values in the 2015 table.*

Source: On-site fields: ['When was HVAC System Last Serviced?', 'Number of HVAC Systems', 'HVAC System Type'].

TABLE 80. AIR FILTER CONDITION BY COOLING SYSTEM TYPE (SITE)

COMPARE WITH TABLE 171, VOLUME 5, IN 2015 RSBS.

Condition	Central AC		Room Window AC		Room Sleeve AC		Ground Source Heat Pump		Ductless Mini-Split Heat Pump[a]		Room Free-Standing AC		Air Source Heat Pump		Mini-Split AC		Overall Statewide[a]	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Fair	22.7%	7.5%	42.9%▲	9.5%	23.4%	15.2%	0.6%	1.3%	0.5%	0.9%	37.3%	34.8%	0.0%	0.0%	73.0%	0.0%	31.7%	5.6%
Good	70.4%	8.0%	45.0%	9.3%	72.2%▲	16.4%	99.4%	1.3%	99.5%	0.9%	62.7%	34.8%	100.0%	0.0%	27.0%	0.0%	60.0%	6.0%
Poor	6.9%	4.4%	12.1%	8.8%	4.4%▼	7.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	8.4%	4.4%
Systems (n)	187	187	137	137	25	25	15	15	11	11	11	11	7	7	2	2	395	395

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for Ductless Mini-Split and Overall Statewide values.*

Source: On-site fields: ['Number of HVAC Systems', 'Condition of HVAC Air Filter', 'HVAC System Type'].

TABLE 81. AIR FILTER CONDITION BY COOLING SYSTEM AGE (SITE)

COMPARE WITH TABLE 172, VOLUME 5, IN 2015 RSBS.

Condition	Less than 2 Years Old		2 to 4 Years Old		5 to 9 Years Old		10 to 14 Years Old		15 to 19 Years Old		20 or More Years Old		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Fair	25.1%	16.4%	34.5%	16.7%	29.3%	10.2%	28.8%	11.2%	29.2%	16.0%	38.5%	14.8%	30.8%	5.5%
Good	74.9%	16.4%	62.9%	16.8%	68.6%	10.2%	54.8%	12.6%	68.8%	16.0%	53.5%	14.5%	63.5%	5.7%
Poor	0.0%	0.0%	2.6%	4.2%	2.0%▼	2.0%	16.3%	9.8%	2.0%	3.3%	8.0%	5.6%	5.6%▼	2.4%
Systems (n)	45	45	88	88	102	102	57	57	34	34	47	47	373	373

Source: On-site fields: ['HVAC System Year Manufactured', 'Number of HVAC Systems', 'Condition of HVAC Air Filter'].

TABLE 82. COOLING SYSTEM CONDITION BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 173, VOLUME 5, IN 2015 RSBS.

Condition	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Well-Maintained	81.3%	6.8%	82.3%	4.5%	84.8%	8.0%	82.1%	4.3%
Not Well-Maintained	15.8%	5.5%	16.2%	4.4%	15.2%	8.0%	15.8%	3.6%
Disrepair	2.9%	4.7%	1.4%	1.4%	0.0%	0.0%	2.1%	2.8%
Systems (n)	171	171	286	286	102	102	559	559

Source: On-site fields: ['Number of HVAC Systems', 'Visual Condition of HVAC System', 'Climate Zone'].

TABLE 83. COOLING SYSTEM CONDITION BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 174, VOLUME 5, IN 2015 RSBS.

Condition	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Well-Maintained	82.1%	4.3%	96.4%	3.6%	82.1%	4.3%
Not Well-Maintained	15.9%	3.6%	3.6%	3.6%	15.8%	3.6%
Disrepair	2.1%	2.8%	0.0%	0.0%	2.1%	2.8%
Systems (n)	464	464	95	95	559	559

Source: On-site fields: ['Number of HVAC Systems', 'Visual Condition of HVAC System', 'Construction Type'].

TABLE 84. COOLING SYSTEM CONDITION BY SYSTEM TYPE (SITE)

COMPARE WITH TABLE 175, VOLUME 5, IN 2015 RSBS.

Condition	Central AC		Room Window AC		Ductless Mini-Split Heat Pump[a]		Room Sleeve AC		Room Free-Standing AC		Ground Source Heat Pump		Air Source Heat Pump		Mini-Split AC		Ducted Mini-Split Heat Pump[a]		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Well-Maintained	84.8%	5.1%	79.4%	8.2%	87.5%	10.7%	78.3%	14.7%	86.3%	18.0%	99.5%	1.0%	91.6%	17.7%	67.8%	0.0%	100.0%	0.0%	82.1%	4.3%
Not Well-Maintained	15.2%	5.1%	15.8%	6.2%	12.5%	10.7%	21.7%	14.7%	13.7%	18.0%	0.5%	1.0%	8.4%	17.7%	32.2%	0.0%	0.0%	0.0%	15.8%	3.6%
Disrepair	0.0%	0.0%	4.9%	6.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	2.1%	2.8%
Systems (n)	230	230	194	194	50	50	34	34	17	17	17	17	10	10	5	5	2	2	559	559

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for Ductless Mini-Split Heat Pump and Ducted Mini-Split Heat Pump values.*

Source: On-site fields: ['Number of HVAC Systems', 'Visual Condition of HVAC System', 'HVAC System Type'].

TABLE 85. COOLING SYSTEM CONDITION BY SYSTEM AGE (SITE)

COMPARE WITH TABLE 176, VOLUME 5, IN 2015 RSBS.

Condition	Less than 2 Years Old		2 to 4 Years Old		5 to 9 Years Old		10 to 14 Years Old		15 to 19 Years Old		20 or More Years Old		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Well-Maintained	98.4%	2.7%	93.8%	6.2%	89.7%	4.8%	82.4%	8.3%	80.3%	12.5%	66.0%	13.1%	85.2%▲	3.4%
Not Well-Maintained	1.6%	2.7%	6.2%	6.2%	9.9%	4.7%	17.6%	8.3%	19.7%	12.5%	32.0%	12.9%	14.4%▼	3.3%
Disrepair	0.0%	0.0%	0.0%	0.0%	0.4%	0.6%	0.0%	0.0%	0.0%	0.0%	2.0%	2.5%	0.4%	0.4%
Systems (n)	62	62	120	120	150	150	91	91	51	51	61	61	535	535

Source: On-site fields: ['HVAC System Year Manufactured', 'Number of HVAC Systems', 'Visual Condition of HVAC System'].

TABLE 86. SYSTEM TYPE SERVED BY DUCTING BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 177, VOLUME 5, IN 2015 RSBS.

System Served	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Heating/Cooling	42.1%	13.5%	66.8%▲	6.1%	29.7%	13.6%	53.2%	6.2%
Heating	7.9%	7.4%	26.4%▼	5.7%	67.1%	14.0%	24.4%▼	4.8%
Cooling	50.0%	13.7%	6.8%	3.3%	3.2%	5.3%	22.4%	6.1%
Respondents (n)	38	38	222	222	45	45	305	305

Source: On-site fields: ['System Type Served by Ducting', 'Climate Zone'].

TABLE 87. PERCENTAGE OF DUCT DISTRIBUTION IN UNCONDITIONED SPACE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 179, VOLUME 5, IN 2015 RSBS.

Percentage in Unconditioned Space	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	23.5%	12.3%	36.2%	6.3%	26.1%	13.1%	30.5%	5.6%
10	11.8%	9.4%	6.9%	3.3%	6.5%	7.3%	8.6%	3.8%
20	5.9%	6.8%	3.2%	2.3%	0.0%	0.0%	3.7%	2.6%
30	0.0%	0.0%	3.8%	2.5%	0.0%	0.0%	2.0%	1.3%
40	2.9%	4.9%	3.8%	2.5%	0.0%	0.0%	3.0%	2.1%
50	5.9%	6.8%	5.0%	2.9%	0.1%▼	0.2%	4.7%	2.8%
60	5.9%	6.8%	2.5%	2.0%	0.0%	0.0%	3.4%	2.6%
70	0.0%	0.0%	3.2%▼	2.3%	0.0%	0.0%	1.7%▼	1.2%
80	11.8%	9.4%	5.0%▼	2.9%	6.6%	7.3%	7.6%	3.7%
90	2.9%	4.9%	3.8%	2.5%	6.4%	7.3%	3.8%	2.3%
100	29.4%	13.3%	26.4%	5.8%	54.4%▲	14.9%	31.0%▲	5.8%
Mean	51.5%	12.2%	44.2%	5.6%	66.2%	13.6%	51.0%	6.3%
Respondents (n)	34	34	219	219	45	45	298	298

Source: On-site fields: ['Percentage Ducting in Unconditioned Space', 'Climate Zone'].

TABLE 88. PERCENTAGE OF DUCT DISTRIBUTION IN UNCONDITIONED SPACE INSULATED BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 180, VOLUME 5, IN 2015 RSBS.

Percentage in Unconditioned Space	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	38.2%	14.1%	79.7%	5.2%	80.6%	11.8%	60.1%	7.8%
10	2.9%	4.9%	0.6%	1.0%	0.0%	0.0%	1.6%	2.3%
20	0.0%	0.0%	1.9%	1.8%	0.0%	0.0%	0.7%	0.7%
30	2.9%	4.9%	0.7%	1.0%	6.4%	7.4%	2.6%	2.6%
40	0.0%	0.0%	0.6%	1.0%	0.0%	0.0%	0.2%	0.4%
50	5.9%	6.8%	1.3%▼	1.5%	9.6%	8.9%	4.7%	3.5%
60	0.0%	0.0%	0.6%	1.0%	0.0%	0.0%	0.2%	0.4%
70	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
80	5.9%	6.8%	0.6%	1.0%	0.0%	0.0%	3.0%	3.2%
90	8.8%	8.3%	3.8%	2.5%	0.0%	0.0%	5.6%	4.0%
100	35.3%	13.9%	10.2%	3.9%	3.4%▼	5.3%	21.1%	7.0%
Mean	52.1%	13.5%	16.0%	4.5%	10.1%	6.9%	32.2%	7.1%
Respondents (n)	34	34	219	219	45	45	298	298

Source: On-site fields: ['Percentage Ducting Insulated in Unconditioned Space', 'Climate Zone'].

TABLE 89. DUCT INSULATION TYPE IN UNCONDITIONED SPACE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 181, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	16.0%	12.6%	72.9%	7.3%	73.8%	15.5%	51.5%▼	7.8%
Fiberglass Wrap	84.0%▲	12.6%	25.0%▲	7.1%	21.8%	14.5%	46.8%▲	7.9%
Bubble Wrap	0.0%	0.0%	2.0%	2.3%	4.3%	7.2%	1.6%	1.5%
Various	0.0%	0.0%	0.2%	0.1%	0.1%	0.2%	0.1%▼	0.1%
Respondents (n)	25	25	133	133	30	30	188	188

Source: On-site fields: ['HVAC Duct Insulation Type', 'Garage Finished Interior?', 'Climate Zone'].

TABLE 90. DUCT TYPE IN UNCONDITIONED SPACE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 182, VOLUME 5, IN 2015 RSBS.

Duct Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Metal	26.9%▼	14.9%	59.1%▼	8.0%	56.2%	17.5%	46.3%▼	7.6%
Mixed[a]	38.5%	16.4%	34.0%	7.7%	39.4%	17.2%	36.4%	7.5%
Flexible	34.6%	16.0%	5.0%▼	3.6%	4.4%	7.2%	16.3%	6.7%
Duct Board	0.0%	0.0%	2.0%	2.3%	0.0%	0.0%	0.9%	1.1%
Respondents (n)	26	26	134	134	30	30	190	190

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for mixed duct type values.*

Source: On-site fields: ['HVAC Duct Type', 'Garage Finished Interior?', 'Climate Zone'].

TABLE 91. AVERAGE VENTILATION EQUIPMENT BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 50, VOLUME 5, IN 2015 RSBS.

Ventilation Equipment	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Ceiling Fans	2.3▲	0.1	2.1▲	0.1	2.3▲	0.2	2.2▲	0.1
Kitchen Exhaust Fans	0.8	0.0	0.7	0.0	0.7	0.0	0.7	0.0
Bathroom Exhaust Fans	1.3▲	0.1	1.5▲	0.1	1.4▲	0.1	1.4▲	0.0
Attic Fans	0.3▲	0.0	0.1	0.0	0.0▼	0.0	0.2	0.0
Whole-House Fans	0.1	0.0	0.1▼	0.0	0.0▲	0.0	0.1▼	0.0
Respondents (n)	508	508	1,205	1,205	481	481	2,194	2,194

Source: Survey fields: ['Number of Ceiling Fans', 'Number of Exhaust Fans Kitchen', ‘Number of Exhaust Fans’, 'Number of Attic Fans', 'Number of Whole House Fans', 'Climate Zone'].

TABLE 92. AVERAGE VENTILATION EQUIPMENT BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 51, VOLUME 5, IN 2015 RSBS.

Ventilation Equipment	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Ceiling Fans	2.2▲	0.1	2.1▼	0.2	2.2▲	0.1
Kitchen Exhaust Fans	0.7	0.0	0.9	0.0	0.7	0.0
Bathroom Exhaust Fans	1.4▲	0.1	2.4	0.2	1.4▲	0.0
Attic Fans	0.2	0.0	0.1	0.0	0.2	0.0
Whole-House Fans	0.1▼	0.0	0.1	0.0	0.1▼	0.0
Respondents (n)	1,676	1,676	518	518	2,194	2,194

Source: Survey fields: ['Number of Ceiling Fans', 'Number of Exhaust Fans Kitchen', ‘Number of Exhaust Fans’, 'Number of Attic Fans', 'Number of Whole House Fans', 'Construction Type'].

TABLE 93. FAN TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 221, VOLUME 5, IN 2015 RSBS.

Fan Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Ceiling	70.4%	8.6%	64.2%	5.4%	68.0%	9.7%	67.7%	4.9%
Plug In	29.6%	8.6%	35.8%	5.4%	32.0%	9.7%	32.3%	4.9%
Fans (n)	243	243	758	758	232	232	1,233	1,233

Source: On-site fields: ['Type/Style of Appliance', 'Number of Appliance Units', 'Climate Zone'].

TABLE 94. FAN USAGE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 222, VOLUME 5, IN 2015 RSBS.

Fan Usage	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Rarely/Never Used	28.3%▲	10.2%	41.2%▲	6.4%	41.2%▲	11.7%	35.3%▲	5.7%
Seasonal	60.9%▼	11.3%	43.2%▼	6.5%	48.1%▼	12.1%	52.0%▼	6.1%
Year Round	10.9%	7.5%	15.5%	5.1%	10.7%▼	5.6%	12.7%	4.0%
Fans (n)	184	184	647	647	205	205	1,036	1,036

Source: On-site fields: ['Fan Usage', 'Number of Appliance Units', 'Climate Zone'].

TABLE 95. SMART THERMOSTAT PRESENCE AND USE BY CLIMATE ZONE (SURVEY)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Smart Thermostat		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Have a Smart Thermostat	Yes	14.4%	2.6%	10.2%	1.7%	4.4%	1.8%	11.5%	1.5%
	No	85.6%	2.6%	89.8%	1.7%	95.6%	1.8%	88.5%	1.5%
	Respondents (n)	520	520	1,250	1,250	429	429	2,199	2,199
Use of Smart Thermostat	Programmed to Change Temperature Automatically	63.2%	9.5%	45.6%	8.8%	36.6%	21.1%	56.0%	6.7%
	Both	24.7%	8.5%	31.9%	8.3%	42.1%	21.8%	28.0%	6.0%
	Manually Change the Temperature	12.1%	6.3%	22.5%	7.4%	21.3%	18.1%	16.0%	4.7%
	Respondents (n)	84	84	178	178	30	30	292	292

Note: This table reports the existence of smart thermostats for primary central heating and/or cooling systems, as well as the thermostat usage for participants with smart thermostats. Results cannot be compared with 2015 RSBS results, which did not report on smart thermostats.

Source: Survey fields: ['Thermostat Type', 'Programmed Thermostat Setting', 'Climate Zone'].

BACK TO REPORT

TABLE 96. SMART THERMOSTAT PRESENCE AND USE BY HOME VINTAGE (SURVEY)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Smart Thermostat		Existing Homes		New Homes		Overall Statewide	
		%	EB	%	EB	%	EB
Have a Smart Thermostat	Yes	11.4%	1.5%	27.6%	5.0%	11.5%	1.5%
	No	88.6%	1.5%	72.4%	5.0%	88.5%	1.5%
	Respondents (n)	1,651	1,651	548	548	2,199	2,199
Use of Smart Thermostat	Programmed to Change Temperature Automatically	56.2%	6.8%	43.8%	10.8%	56.0%	6.7%
	Both	28.0%	6.1%	24.1%	9.8%	28.0%	6.0%
	Manually Change the Temperature	15.7%	4.8%	32.1%	11.4%	16.0%	4.7%
	Respondents (n)	167	167	125	125	292	292

Note: This table reports the existence of smart thermostat for primary central heating and/or cooling systems, as well as thermostat usage for participants with smart thermostats. Results cannot be compared with 2015 RSBS results, which did not report on smart thermostats.

Source: Survey fields: ['Thermostat Type', 'Programmed Thermostat Setting', 'Construction Type'].

TABLE 97. SMART THERMOSTAT PRESENCE AND USE BY SYSTEM FUEL TYPE (SURVEY)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Smart Thermostat		Electricity		Natural Gas		Oil		Other		Propane		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Have a Smart Thermostat	Yes	13.8%	6.2%	13.1%	1.9%	7.0%	2.9%	0.2%	0.2%	6.0%	3.9%	11.4%	1.5%
	No	86.2%	6.2%	86.9%	1.9%	93.0%	2.9%	99.8%	0.2%	94.0%	3.9%	88.6%	1.5%
	Respondents (n)	167	167	1,449	1,449	297	297	43	43	221	221	2,177	2,177
Use of Smart Thermostat	Programmed to Change Temperature Automatically	36.8%	24.1%	55.3%	7.6%	64.2%	22.0%	75.0%	0.0%	79.2%	28.7%	55.7%	6.8%
	Both	26.1%	22.7%	28.3%	6.8%	29.0%	21.5%	0.0%	0.0%	19.1%	28.7%	28.1%	6.1%
	Manually Change the Temperature	37.1%	24.0%	16.4%	5.5%	6.8%	8.1%	25.0%	0.0%	1.8%	2.0%	16.3%	4.8%
	Respondents (n)	29	29	212	212	18	18	4	4	25	25	288	288

Note: This table reports the existence of smart thermostat for primary central heating and/or cooling systems, as well as thermostat usage for participants with smart thermostats. Results cannot be compared with 2015 RSBS results, which did not report on smart thermostats.

Source: Survey fields: ['Thermostat Type', 'Primary Fuel Type', 'Programmed Thermostat Setting', 'Climate Zone'].

TABLE 98. PROGRAMMABLE THERMOSTAT PRESENCE AND USE BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 52, VOLUME 5, IN 2015 RSBS.

Programmable Thermostat		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Have a Programmable Thermostat	Yes	80.8%▲	2.9%	77.3%▲	2.4%	60.1%	4.4%	76.7%▲	1.8%
	No	19.2%▼	2.9%	22.7%▼	2.4%	39.9%	4.4%	23.3%▼	1.8%
	Respondents (n)	520	520	1,250	1,250	429	429	2,199	2,199
Use of Programmable Thermostat	Programmed to Change Temperature Automatically	62.7%▲	4.0%	54.1%▲	3.2%	53.4%▲	5.9%	58.5%▲	2.5%
	Manually Change the Temperature	21.9%	3.5%	29.5%▼	2.9%	31.1%▼	5.4%	25.7%▼	2.2%
	Both	15.4%	3.0%	16.4%	2.4%	15.5%	4.3%	15.8%	1.8%
	Respondents (n)	417	417	1,011	1,011	272	272	1,700	1,700

Note: This table reports thermostat type for primary central heating and/or cooling systems, as well as thermostat usage for participants with programmable thermostats. For this table, programmable thermostats include smart thermostats.

Source: Survey fields: ['Thermostat Type', 'Programmed Thermostat Setting', 'Climate Zone'].

BACK TO REPORT

TABLE 99. PROGRAMMABLE THERMOSTAT PRESENCE AND USE BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 53, VOLUME 5, IN 2015 RSBS.

Programmable Thermostat		Existing Homes		New Homes		Overall Statewide	
		%	EB	%	EB	%	EB
Have a Programmable Thermostat	Yes	76.6%▲	1.8%	87.6%	3.5%	76.7%▲	1.8%
	No	23.4%▼	1.8%	12.4%	3.5%	23.3%▼	1.8%
	Respondents (n)	1,651	1,651	548	548	2,199	2,199
Use of Programmable Thermostat	Programmed to Change Temperature Automatically	58.6%▲	2.5%	48.0%	5.4%	58.5%▲	2.5%
	Manually Change the Temperature	25.7%▼	2.2%	31.6%	5.1%	25.7%▼	2.2%
	Both	15.7%	1.9%	20.4%	4.9%	15.8%	1.8%
	Respondents (n)	1,219	1,219	481	481	1,700	1,700

Note: This table reports thermostat type for primary central heating and/or cooling systems, as well as thermostat usage for participants with programmable thermostats. For this table, programmable thermostats include smart thermostats.

Source: Survey fields: ['Thermostat Type', 'Programmed Thermostat Setting', 'Construction Type'].

TABLE 100. PROGRAMMABLE THERMOSTAT PRESENCE AND USE BY SYSTEM FUEL TYPE (SURVEY)

COMPARE WITH TABLE 54, VOLUME 5, IN 2015 RSBS.

Programmable Thermostat		Natural Gas		Oil		Propane		Electricity		Other		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Have a Programmable Thermostat	Yes	80.8%▲	2.0%	66.2%	4.9%	68.4%	7.9%	75.6%▲	7.3%	54.9%	15.6%	76.7%▲	1.8%
	No	19.2%▼	2.0%	33.8%	4.9%	31.6%	7.9%	24.4%▼	7.3%	45.1%	15.6%	23.3%▼	1.8%
	Respondents (n)	1,449	1,449	297	297	221	221	167	167	43	43	2,177	2,177
Use of Programmable Thermostat	Programmed to Change Temperature Automatically	58.3%▲	2.9%	59.3%	6.5%	61.7%▲	10.3%	56.0%	10.4%	68.3%	20.2%	58.6%▲	2.5%
	Manually Change the Temperature	25.9%	2.6%	24.8%	5.6%	25.3%▼	9.4%	23.6%▼	8.4%	26.0%	18.6%	25.5%▼	2.2%
	Both	15.8%	2.2%	15.9%	4.9%	13.0%▼	7.0%	20.5%	9.0%	5.7%	9.2%	15.9%	1.9%
	Respondents (n)	1,182	1,182	189	189	162	162	127	127	26	26	1,686	1,686

Note: This table reports thermostat type for primary central heating and/or cooling systems, as well as thermostat usage for participants with programmable thermostats. For this table, programmable thermostats include smart thermostats.

Source: Survey fields: ['Thermostat Type', 'Primary Fuel Type', 'Programmed Thermostat Setting'].

TABLE 101. CONNECTED THERMOSTAT FOR PRIMARY HEATING AND/OR COOLING SYSTEM (SURVEY)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Connected Thermostat	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	20.5%	3.1%	13.2%	1.9%	7.1%	2.3%	15.9%	1.7%
No	79.5%	3.1%	86.8%	1.9%	92.9%	2.3%	84.1%	1.7%
Respondents (n)	502	502	1,224	1,224	423	423	2,149	2,149

Note: This table reports thermostat type for primary central heating and/or cooling systems. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: Survey fields: ['Internet Connected Thermostat', 'Climate Zone'].

BACK TO REPORT

TABLE 102. WATER HEATING FUEL TYPE BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 38, VOLUME 1, IN 2015 RSBS.

Fuel	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Natural Gas	70.8%▲	3.4%	71.9%▲	2.5%	40.3%▲	4.1%	66.5%▲	2.0%
Electricity	6.9%	1.9%	15.6%▼	2.0%	32.0%▼	3.8%	14.0%▼	1.3%
Fuel Oil	21.1%▼	3.0%	5.3%	1.2%	9.9%	2.5%	13.5%▼	1.6%
Propane	0.2%▼	0.3%	6.4%▼	1.3%	15.0%	2.9%	4.8%▼	0.7%
Other	0.8%	0.7%	0.3%	0.3%	1.3%	0.9%	0.7%	0.4%
Kerosene	0.0%	0.0%	0.1%	0.2%	0.8%	0.7%	0.2%	0.1%
Solar	0.0%	0.0%	0.3%	0.3%	0.8%	0.7%	0.2%	0.2%
Respondents (n)	527	527	1,277	1,277	513	513	2,317	2,317

Source: Survey fields: ['Water Heating Fuel Type', 'Primary Water Heating System', 'Climate Zone'].

BACK TO REPORT

TABLE 103. EXISTING HOMES: WATER HEATING FUEL BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 63, VOLUME 5, IN 2015 RSBS.

Fuel	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Natural Gas	70.7%▲	3.4%	72.1%▲	2.5%	40.6%▲	4.1%	66.6%▲	2.0%
Electricity	6.9%	1.9%	15.5%▼	2.0%	31.9%▼	3.9%	13.9%▼	1.4%
Fuel Oil	21.1%▼	3.0%	5.4%	1.3%	9.9%	2.5%	13.6%▼	1.6%
Propane	0.2%▼	0.3%	6.3%▼	1.3%	14.8%	3.0%	4.7%▼	0.7%
Other	0.8%	0.7%	0.3%	0.3%	1.3%	0.9%	0.7%	0.4%
Kerosene	0.0%	0.0%	0.1%	0.2%	0.8%	0.7%	0.2%	0.1%
Solar	0.0%	0.0%	0.3%	0.3%	0.8%	0.7%	0.2%	0.2%
Respondents (n)	492	492	877	877	392	392	1,761	1,761

Source: Survey fields: ['Water Heating Fuel Type', 'Primary Water Heating System', 'Climate Zone', 'Construction Type'].

TABLE 104. NEW HOMES: WATER HEATING FUEL BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 39, VOLUME 1, IN 2015 RSBS.

Fuel	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Natural Gas	80.0%▲	11.5%	57.0%	4.1%	14.9%	5.4%	56.4%▲	4.9%
Electricity	14.3%	10.0%	25.3%▲	3.6%	47.9%	7.5%	26.0%	4.0%
Propane	2.9%▼	4.8%	16.5%	3.1%	33.1%	7.1%	15.3%▼	2.8%
Fuel Oil	2.9%▼	4.8%	0.0%	0.0%	1.7%	1.9%	1.2%▼	1.5%
Solar	0.0%	0.0%	1.0%	0.8%	0.8%	1.4%	0.6%▼	0.5%
Other	0.0%	0.0%	0.3%▼	0.4%	1.7%	1.9%	0.4%▼	0.4%
Respondents (n)	35	35	400	400	121	121	556	556

Source: Survey fields: ['Water Heating Fuel Type', 'Primary Water Heating System', 'Climate Zone', 'Construction Type'].

TABLE 105. WATER HEATING FUEL TYPE BY HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 40, VOLUME 1, IN 2015 RSBS.

Fuel	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Natural Gas	66.6%▲	2.0%	56.4%▲	4.9%	66.5%▲	2.0%
Electricity	13.9%▼	1.4%	26.0%	4.0%	14.0%▼	1.3%
Fuel Oil	13.6%▼	1.6%	1.2%▼	1.5%	13.5%▼	1.6%
Propane	4.7%▼	0.7%	15.3%▼	2.8%	4.8%▼	0.7%
Other	0.7%	0.4%	0.4%▼	0.4%	0.7%	0.4%
Kerosene	0.2%	0.1%	0.0%	0.0%	0.2%	0.1%
Solar	0.2%	0.2%	0.6%▼	0.5%	0.2%	0.2%
Respondents (n)	1,761	1,761	556	556	2,317	2,317

Source: Survey fields: ['Water Heating Fuel Type', 'Primary Water Heating System', 'Construction Type'].

TABLE 106. WATER HEATING FUEL TYPE BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Natural Gas	73.6%	7.9%	77.1%	4.7%	37.9%	9.5%	69.3%	4.5%
Fuel Oil	24.1%	7.6%	5.7%	2.6%	9.8%	5.8%	15.1%	3.9%
Electricity	2.3%	2.7%	14.7%	4.0%	35.4%	9.4%	12.0%	2.6%
Propane	0.0%	0.0%	2.5%	1.7%	15.6%	7.1%	3.3%	1.3%
Kerosene	0.0%	0.0%	0.0%	0.0%	1.4%	2.3%	0.2%	0.4%
Respondents (n)	85	85	274	274	91	91	450	450

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['DHW Fuel Type', 'Climate Zone'].

BACK TO REPORT

TABLE 107. WATER HEATING FUEL TYPE BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Fuel Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Natural Gas	69.5%	4.5%	42.5%	8.6%	69.3%	4.5%
Fuel Oil	15.2%	4.0%	0.0%	0.0%	15.1%	3.9%
Electricity	11.8%	2.7%	42.9%	8.6%	12.0%	2.6%
Propane	3.3%	1.4%	14.5%	6.2%	3.3%	1.3%
Kerosene	0.2%	0.4%	0.0%	0.0%	0.2%	0.4%
Respondents (n)	360	360	90	90	450	450

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['DHW Fuel Type', 'Construction Type'].

TABLE 108. WATER HEATER TYPE BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 55, VOLUME 5, IN 2015 RSBS.

Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Storage Water Heater	63.2%	3.9%	72.6%▼	2.6%	64.5%▼	4.1%	66.8%▼	2.2%
Integrated with Heating System Boiler	22.7%▼	3.3%	10.2%	1.8%	15.8%	3.1%	17.0%	1.8%
Heat Pump Water Heater[a]	1.5%	0.9%	5.2%	1.3%	7.0%	2.2%	3.7%	0.7%
Tankless/On-Demand Water Heater	11.2%▲	2.5%	11.3%▲	1.8%	12.1%▲	2.8%	11.4%▲	1.4%
Other	1.4%	0.9%	0.8%	0.5%	0.6%	0.6%	1.0%▲	0.5%
Respondents (n)	444	444	1,137	1,137	473	473	2,054	2,054

[a] *Survey data appear to overreport the existence of heat pump water heaters, which likely results from respondent error.*

Source: Survey fields: ['Primary Water Heating System', 'Climate Zone'].

TABLE 109. WATER HEATER TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 41, VOLUME 1, IN 2015 RSBS.

Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Storage Water Heater	66.7%	8.4%	84.0%	4.1%	77.3%	8.2%	74.7%	4.5%
Space Heating Boiler with Tank	19.5%	7.1%	6.7%	2.8%	14.0%	6.8%	13.9%	3.7%
Tankless/On-Demand	6.9%	4.5%	5.9%	2.6%	7.3%	5.0%	6.6%	2.5%
Space Heating Boiler with Coil	6.9%	4.5%	1.4%	1.3%	1.4%	2.3%	4.0%	2.2%
Ground Source Heat Pump with Tank	0.0%	0.0%	1.0%	1.1%	0.0%	0.0%	0.4%	0.4%
Heat Pump Water Heater	0.0%	0.0%	1.0%	1.1%	0.0%▼	0.1%	0.4%	0.4%
Water Heaters (n)	87	87	280	280	95	95	462	462

Source: On-site fields: ['No. of Water Heaters', 'DHW Type', 'Climate Zone'].

TABLE 110. WATER HEATER TYPE BY HOME VINTAGE (SITE)
THIS TABLE IS NEW WITH THE 2019 RBSA.

Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Storage Water Heater	74.8%	4.5%	60.1%	8.7%	74.6%	4.5%
Space Heating Boiler with Tank	14.0%	3.7%	2.0%	2.3%	13.9%	3.7%
Tankless/On-Demand	6.5%	2.5%	24.7%	7.5%	6.6%	2.5%
Space Heating Boiler with Coil	4.1%	2.3%	0.0%	0.0%	4.0%	2.2%
Heat Pump Water Heater	0.4%	0.4%	7.2%	4.4%	0.4%	0.4%
Ground Source Heat Pump with Tank	0.4%	0.4%	6.0%	4.0%	0.4%	0.4%
Water Heaters (n)	367	367	95	95	462	462

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['No. of Water Heaters', 'DHW Type', 'Construction Type'].

BACK TO REPORT

TABLE 111. WATER HEATER TYPE BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 56, VOLUME 5, IN 2015 RSBS.

Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Storage Water Heater	67.0%▼	2.2%	49.8%▼	6.2%	66.8%▼	2.2%
Integrated with Heating System Boiler	17.1%	1.8%	12.4%	5.1%	17.0%	1.8%
Heat Pump Water Heater[a]	3.6%	0.7%	11.6%	3.7%	3.7%	0.7%
Tankless/On-Demand Water Heater	11.3%▲	1.5%	25.5%	5.5%	11.4%▲	1.4%
Other	1.0%▲	0.5%	0.7%	0.5%	1.0%▲	0.5%
Respondents (n)	1,562	1,562	492	492	2,054	2,054

[a] *Survey data appear to overreport the existence of heat pump water heaters, which likely results from respondent error.*

Source: Survey fields: ['Water Heating Fuel Type', 'Construction Type'].

TABLE 112. WATER HEATER TYPE BY WATER HEATER FUEL (SURVEY)
COMPARE WITH TABLE 57, VOLUME 5, IN 2015 RSBS.

Type	Natural Gas		Electricity		Propane		Fuel Oil		Other		Solar		Kerosene		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Storage Water Heater	78.1%▼	2.4%	61.1%▼	5.3%	54.1%▼	8.0%	30.7%	6.3%	27.8%	29.0%	19.7%	36.1%	100.0%	0.0%	67.0%▼	2.2%
Integrated with Heating System Boiler	9.9%	1.8%	6.4%	3.4%	20.8%▲	6.5%	58.2%	6.7%	47.0%	28.8%	20.8%	39.1%	0.0%	0.0%	17.1%	1.8%
Heat Pump Water Heater[a]	0.0%	0.0%	22.7%	4.4%	0.0%	0.0%	0.0%	0.0%	6.0%	10.7%	19.6%	36.1%	0.0%	0.0%	3.5%	0.7%
Tankless/On-Demand Water Heater	11.5%▲	1.8%	8.3%▲	3.1%	25.1%	6.9%	9.5%	4.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	11.3%▲	1.5%
Other	0.6%	0.5%	1.4%	1.4%	0.0%	0.0%	1.6%	1.8%	19.2%	24.2%	39.9%	45.9%	0.0%	0.0%	1.1%▲	0.5%
Respondents (n)	1,182	1,182	434	434	192	192	178	178	15	15	10	10	3	3	2,015	2,015

[a] *Survey data appear to overreport the existence of heat pump water heaters, which likely results from respondent error.*

Source: Survey fields: ['Primary Water Heating System', 'Water Heating Fuel Type'].

TABLE 113. NEW HOMES: WATER HEATER TYPE BY WATER HEATER AGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

DHW type	2015		After 2015		Before 2015		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Ground Source Heat Pump with Tank	2.3%	3.1%	0.5%	0.7%	3.8%	4.4%	3.2%	3.4%
Heat Pump Water Heater	2.5%	3.3%	0.8%	0.9%	3.8%	4.4%	3.2%	3.4%
Instantaneous	1.7%	2.6%	0.3%	0.5%	5.8%	9.4%	4.7%	7.4%
Storage Water Heater	93.5%	6.9%	98.4%	1.4%	86.6%	10.6%	88.8%	8.4%
Systems (n)	20	20	30	30	49	49	99	99

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['DHW Manufacture Year', 'Construction Type', 'No. of Water Heaters', 'DHW Type'].

TABLE 114. STORAGE WATER HEATER TANK SIZE BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Water Heater Tank Size	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
55 gallons and above	7.0%	3.4%	8.9%	5.9%	7.0%	3.4%
55 gallons and below	93.0%	3.4%	91.1%	5.9%	93.0%	3.4%
Respondents (n)	289	289	64	64	353	353

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Storage Volume of the Unit (Gallons)', 'No. of Water Heaters', 'Construction Type'].

BACK TO REPORT

TABLE 115. PRIMARY WATER HEATER AGE BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 58, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	12.9%▼	2.5%	13.5%	1.9%	11.0%	2.6%	12.8%▼	1.4%
2 to 4 Years	17.9%	2.9%	17.8%▼	2.1%	21.3%	3.5%	18.4%	1.7%
5 to 9 Years	31.0%	3.5%	30.9%	2.6%	32.3%	4.0%	31.2%	2.0%
10 to 14 Years	20.6%	3.0%	22.0%	2.3%	19.6%	3.4%	21.0%	1.8%
15 to 19 Years	7.1%	1.9%	8.7%▲	1.6%	8.6%	2.4%	7.9%▲	1.2%
20 or More Years	10.4%	2.3%	7.1%	1.5%	7.3%	2.2%	8.7%	1.3%
Respondents (n)	516	516	1,257	1,257	494	494	2,267	2,267

Source: Survey fields: ['Age of Water Heating System', 'Climate Zone'].

BACK TO REPORT

TABLE 116. PRIMARY WATER HEATER AGE BY HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 59, VOLUME 5, IN 2015 RSBS.

Age	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Less than 2 Years	12.7%▼	1.5%	34.3%▲	4.9%	12.8%▼	1.4%
2 to 4 Years	18.1%	1.7%	64.0%▲	4.9%	18.4%	1.7%
5 to 9 Years	31.4%	2.0%	1.5%▼	1.5%	31.2%	2.0%
10 to 14 Years	21.1%	1.8%	0.2%▼	0.3%	21.0%	1.8%
15 to 19 Years	8.0%▲	1.2%	0.0%	0.0%	7.9%▲	1.2%
20 or More Years	8.8%	1.3%	0.0%	0.0%	8.7%	1.3%
Respondents (n)	1,685	1,685	582	582	2,267	2,267

Source: Survey fields: ['Age of Water Heating System', 'Construction Type'].

TABLE 117. PRIMARY WATER HEATING SYSTEM AGE BY WATER HEATER TYPE (SURVEY)

COMPARE WITH TABLE 60, VOLUME 5, IN 2015 RSBS.

Age	Storage Tank Water Heater		Heat Pump Water Heater[a]		Tankless/On-Demand Water Heater		Integrated with Heating System Boiler		Other		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	13.1%	1.9%	11.9%	6.4%	19.9%	5.6%	7.7%	3.2%	25.6%	23.4%	13.1%	1.6%
2 to 4 Years	19.5%	2.2%	29.2%	10.0%	19.8%▼	5.5%	10.1%▼	3.4%	30.8%	24.0%	18.4%	1.8%
5 to 9 Years	32.3%	2.6%	33.1%	10.4%	33.1%	6.4%	21.9%▼	5.1%	25.9%	23.5%	30.6%	2.1%
10 to 14 Years	21.5%	2.3%	15.5%	8.0%	16.2%▲	5.0%	23.6%	5.1%	13.2%	13.4%	21.0%	1.9%
15 to 19 Years	7.4%	1.5%	4.2%	3.9%	6.7%▲	3.4%	12.6%	3.8%	0.0%	0.0%	8.0%▲	1.2%
20 Years or More	6.1%	1.3%	6.1%	6.2%	4.4%	2.5%	24.1%▲	5.3%	4.5%▼	8.0%	8.9%	1.4%
Respondents (n)	1,285	1,285	122	122	294	294	261	261	19	19	1,981	1,981

[a] *Survey data appear to overreport the existence of heat pump water heaters, which likely results from respondent error.*

Source: Survey fields: ['Primary Water Heating System', 'Age of Water Heating System'].

TABLE 118. PRIMARY WATER HEATER ENERGY STAR RATED BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 61, VOLUME 5, IN 2015 RSBS.

ENERGY STAR Water Heater	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	81.2%	8.9%	81.5%	7.6%	94.9%▲	5.7%	83.5%	5.3%
No	18.8%	8.9%	18.5%	7.6%	5.1%▼	5.7%	16.5%	5.3%
Respondents (n)	62	62	133	133	64	64	259	259

Source: Survey fields: ['Energy Star Water Heating System', 'Climate Zone'].

TABLE 119. PRIMARY WATER HEATER ENERGY STAR RATED BY HOME VINTAGE (SURVEY)

COMPARE WITH TABLE 62, VOLUME 5, IN 2015 RSBS.

ENERGY STAR Water Heater	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Yes	83.5%	5.4%	88.0%	8.0%	83.5%	5.3%
No	16.5%	5.4%	12.0%	8.0%	16.5%	5.3%
Respondents (n)	163	163	96	96	259	259

Source: Survey fields: ['Energy Star Water Heating System', 'Construction Type'].

TABLE 120. WATER HEATER YEAR OF MANUFACTURE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 64, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
1969 or Earlier	1.1%	1.9%	2.4%	1.7%	1.4%	2.3%	1.6%	1.2%
1970 to 1979	2.3%	2.7%	0.5%	0.8%	0.0%	0.0%	1.3%	1.3%
1980 to 1989	3.4%	3.3%	0.9%	1.1%	1.4%	2.3%	2.2%	1.6%
1990 to 1999	10.3%	5.4%	10.4%	3.5%	11.2%	6.2%	10.5%	3.0%
2000 to 2009	33.3%▼	8.4%	32.7%▼	5.3%	30.7%▼	9.0%	32.7%▼	4.6%
2009 to 2014	32.2%	8.3%	27.1%	5.1%	32.1%	9.2%	30.3%	4.6%
2015[a]	2.3%	2.7%	7.5%	2.9%	4.5%	3.9%	4.6%	1.8%
2016[a]	6.9%	4.5%	8.9%	3.2%	4.6%	3.9%	7.3%	2.5%
2017[a]	6.9%	4.5%	5.8%	2.6%	8.6%	5.4%	6.8%	2.5%
2018[a]	1.1%	1.9%	3.8%	2.2%	5.6%	4.5%	2.8%	1.4%
Water Heaters (n)	87	87	280	280	95	95	462	462

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for years 2015 through 2018.*

Source: On-site fields: ['DHW Manufacture Year', 'No. of Water Heaters', 'Climate Zone'].

TABLE 121. NEW HOMES: AVERAGE HOME ENERGY RATING (HERS INDEX SCORE) (SITE)

COMPARE WITH TABLE 47, VOLUME 1, IN 2015 RSBS.

HERS Index	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	67.6	27.7	53.9▼	4.6	60.4	8.2	55.7▼	3.9
Respondents (n)	5	5	68	68	22	22	90	90

[a] *Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.*

Source: On-site fields: ['Home Energy Rating Systems Score', 'Climate Zone'].

TABLE 122. HOME AIR LEAKAGE IN CFM50 BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

CFM50	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 1,000	0.0%	0.0	3.6%	2.3%	8.1%	6.4%	2.6%	1.4%
1,000 to Less than 2,000	7.2%	0.1	33.6%	6.0%	42.0%	11.6%	22.6%	4.3%
2,000 to Less than 3,000	35.7%	0.1	35.3%	6.0%	30.0%	10.8%	34.7%	5.7%
3,000 to Less than 4,000	23.2%	0.1	14.1%	4.4%	14.0%	8.2%	18.3%	4.8%
4,000 to Less than 5,000	16.1%	0.1	8.8%	3.6%	2.0%	3.3%	11.1%	4.1%
5,000 to Less than 6,000	12.5%	0.1	2.3%	1.9%	4.0%	4.6%	7.3%	3.6%
6,000 to Less than 8,000	1.8%	0.0	1.8%	1.7%	0.0%	0.0%	1.5%	1.5%
More than 8,000	3.6%	0.0	0.6%	1.0%	0.0%	0.0%	1.9%	1.9%
Mean (CFM50)	3,662	345.6	2,555	186.4	2,241	258.3	3,033	194.1
Respondents (n)	56	56	236	236	72	72	364	364

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Building Air Leakage Measured by Blower Door Test', 'Climate Zone'].

BACK TO REPORT

TABLE 123. HOME AIR LEAKAGE IN CFM50 BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

CFM50	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Less than 1,000	2.6%	0.0	18.8%	6.9%	2.6%	1.4%
1,000 to Less than 2,000	22.6%	0.0	41.6%	11.5%	22.6%	4.3%
2,000 to Less than 3,000	34.7%	0.1	34.0%	12.8%	34.7%	5.7%
3,000 to Less than 4,000	18.3%	0.0	5.6%	8.9%	18.3%	4.8%
4,000 to Less than 5,000	11.1%	0.0	0.0%	0.0%	11.1%	4.1%
5,000 to Less than 6,000	7.3%	0.0	0.0%	0.0%	7.3%	3.6%
6,000 to Less than 8,000	1.5%	0.0	0.0%	0.0%	1.5%	1.5%
More than 8,000	1.9%	0.0	0.0%	0.0%	1.9%	1.9%
Mean (CFM50)	3,041	195.1	1,459	119.3	3,033	194.1
Respondents (n)	276	276	88	88	364	364

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Building Air Leakage Measured by Blower Door Test', 'Construction Type'].

BACK TO REPORT

TABLE 124. HOME AIR LEAKAGE AIR CHANGES PER HOUR AT 50 PASCALS BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

ACH50	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 5	5.4%	5.0%	14.9%	4.5%	24.1%	10.1%	11.9%	3.3%
5 to Less than 10	32.2%	10.4%	47.6%	6.3%	30.0%	10.8%	37.8%	5.6%
10 to Less than 15	30.3%	10.3%	19.9%	5.1%	31.9%	11.0%	26.6%	5.4%
15 to Less than 20	19.6%	8.9%	7.0%	3.2%	8.0%	6.4%	13.0%	4.4%
More than 20	12.5%	7.4%	10.6%	3.9%	6.0%	5.6%	10.8%	3.8%
Mean (ACH50)	13.8	1.8	10.7	0.9	10.2	1.6	12.1	0.9
Respondents (n)	56	56	236	236	72	72	364	364

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Building Air Leakage Measured by Blower Door Test', 'Conditioned Floor Space (measured in square feet)', 'Building Envelope Average Ceiling Height', 'Climate Zone'].

BACK TO REPORT

TABLE 125. HOME AIR LEAKAGE AIR CHANGES PER HOUR AT 50 PASCALS BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

ACH50	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Less than 5	11.8%	0.0	57.2%	12.9%	11.9%	3.3%
5 to Less than 10	37.8%	0.1	42.8%	12.9%	37.8%	5.6%
10 to Less than 15	26.6%	0.1	0.0%	0.0%	26.6%	5.4%
15 to Less than 20	13.0%	0.0	0.0%	0.0%	13.0%	4.4%
More than 20	10.8%	0.0	0.0%	0.0%	10.8%	3.8%
Mean (ACH50)	12.1	1.0	4.0	0.4	12.1	0.9
Respondents (n)	276	276	88	88	364	364

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Building Air Leakage Measured by Blower Door Test', 'Conditioned Floor Space (measured in square feet)', 'Building Envelope Average Ceiling Height', 'Construction Type'].

TABLE 126. TYPE OF GARAGE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 79, VOLUME 5, IN 2015 RSBS.

Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Attached	31.8%	8.4%	53.7%	5.7%	41.6%	9.7%	41.4%▲	4.8%
Free Standing	29.4%	8.2%	21.7%	4.7%	21.4%▼	8.1%	25.3%	4.4%
Below Living Space	12.9%	6.1%	6.7%	2.9%	8.5%	5.5%	10.0%	3.2%
None	25.9%▼	7.9%	17.8%	4.4%	28.6%	8.9%	23.3%▼	4.3%
Respondents (n)	85	85	274	274	92	92	451	451

Source: On-site fields: ['Building Garage Type', 'Climate Zone'].

TABLE 127. TYPE OF GARAGE BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 80, VOLUME 5, IN 2015 RSBS.

Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Attached	41.2%	4.8%	80.1%	7.2%	41.4%▲	4.8%
Free Standing	25.4%	4.5%	9.1%	5.1%	25.3%	4.4%
Below Living Space	10.0%	3.2%	0.0%	0.0%	10.0%	3.2%
None	23.4%▼	4.3%	10.8%	5.7%	23.3%▼	4.3%
Respondents (n)	361	361	90	90	451	451

Source: On-site fields: ['Building Garage Type', 'Construction Type'].

TABLE 128. GARAGE FINISH BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 81, VOLUME 5, IN 2015 RSBS.

Garage Finished Interior	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Finished Insulated	52.6%▲	13.7%	34.9%▲	7.2%	35.3%▲	13.6%	42.5%▲	6.9%
Finished Uninsulated	21.1%	11.2%	28.0%	6.8%	20.7%	11.5%	24.0%	5.7%
Unfinished Insulated[a]	0.0%	0.0%	13.4%	5.1%	8.9%	8.1%	7.1%	2.7%
Unfinished Uninsulated[a]	26.3%	12.1%	23.6%	6.4%	35.1%	13.6%	26.5%	6.1%
Respondents (n)	38	38	177	177	47	47	262	262

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for unfinished insulated and unfinished uninsulated values because they do not map clearly to 2015 RSBS values.*

Source: On-site fields: ['Garage Finished Interior?', 'Climate Zone'].

TABLE 129. GARAGE FINISH BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 82, VOLUME 5, IN 2015 RSBS.

Garage Finished Interior	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Finished Insulated	42.5%▲	6.9%	46.9%▲	9.8%	42.5%▲	6.9%
Finished Uninsulated	23.9%	5.8%	31.9%	9.2%	24.0%	5.7%
Unfinished Insulated[a]	7.1%	2.7%	7.2%	5.2%	7.1%	2.7%
Unfinished Uninsulated[a]	26.6%	6.1%	13.9%	6.8%	26.5%	6.1%
Respondents (n)	190	190	72	72	262	262

[a] *Comparisons cannot be made with the corresponding table in the 2015 RSBS for unfinished insulated and unfinished uninsulated values because they do not map clearly to 2015 RSBS values.*

Source: On-site fields: ['Garage Finished Interior?', 'Construction Type'].

TABLE 130. CONNECTIVITY OF ATTACHED GARAGE BOUNDARY WALL BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 83, VOLUME 5, IN 2015 RSBS.

Connection to Garage	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Well-Sealed	60.6%	14.5%	83.2%▲	6.0%	83.5%▲	11.4%	73.8%▲	6.9%
Some Visible Penetrations	30.3%	13.6%	14.0%▼	5.6%	13.2%▼	10.4%	20.7%▼	6.4%
Obvious Large Penetrations	9.1%	8.5%	2.8%	2.6%	3.3%	5.5%	5.5%	3.8%
Respondents (n)	33	33	150	150	38	38	221	221

Note: This table reports the results of field inspector visual inspection.

Source: On-site fields: ['Building Envelope Connection Boundary wall', 'Climate Zone'].

TABLE 131. CONNECTIVITY OF ATTACHED GARAGE BOUNDARY WALL BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 84, VOLUME 5, IN 2015 RSBS.

Connection to Garage	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Well-Sealed	73.6%▲	6.9%	96.3%	4.4%	73.8%▲	6.9%
Some Visible Penetrations	20.8%▼	6.4%	3.7%	4.4%	20.7%▼	6.4%
Obvious Large Penetrations	5.5%	3.8%	0.0%	0.0%	5.5%	3.8%
Respondents (n)	169	169	52	52	221	221

Note: This table reports the results of field inspector visual inspection.

Source: On-site fields: ['Building Envelope Connection Boundary wall', 'Construction Type'].

TABLE 132. CONNECTIVITY OF ATTACHED GARAGE BOUNDARY CEILING BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 85, VOLUME 5, IN 2015 RSBS.

Connection to Garage	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Well-Sealed	43.3%	15.4%	80.7%▲	7.2%	61.7%	16.2%	61.0%	8.2%
Some Visible Penetrations	43.3%	15.4%	10.8%▼	5.7%	30.6%	15.3%	28.5%	7.8%
Obvious Large Penetrations	13.3%	10.6%	8.4%	5.1%	7.7%	8.9%	10.5%	5.2%
Respondents (n)	30	30	125	125	31	31	186	186

Note: This table reports the results of field inspector visual inspection.

Source: On-site fields: ['Building Envelope Connection Ceiling', 'Climate Zone'].

TABLE 133. CONNECTIVITY OF ATTACHED GARAGE BOUNDARY CEILING BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 86, VOLUME 5, IN 2015 RSBS.

Connection to Garage	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Well-Sealed	60.8%	8.3%	95.9%	4.8%	61.0%	8.2%
Some Visible Penetrations	28.6%	7.9%	2.0%	3.4%	28.5%	7.8%
Obvious Large Penetrations	10.6%	5.3%	2.0%	3.4%	10.5%	5.2%
Respondents (n)	138	138	48	48	186	186

Note: This table reports the results of field inspector visual inspection.

Source: On-site fields: ['Building Envelope Connection Ceiling', 'Construction Type'].

TABLE 134. CONNECTIVITY OF DUCTING IN ATTACHED GARAGE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 87, VOLUME 5, IN 2015 RSBS.

Ducts in Garage	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Some Visible Penetrations	50.0%	44.5%	49.6%	28.8%	0.0%	0.0%	44.2%	23.1%
Well-Sealed	50.0%	44.5%	50.4%	28.8%	67.0%	80.5%	52.1%	23.1%
Respondents (n)	6	6	13	13	4	4	23	23

Note: This table reports the results of field inspector visual inspection.

Source: On-site fields: ['Building Envelope Connection Duct', 'Climate Zone'].

TABLE 135. CONNECTIVITY OF DUCTING IN ATTACHED GARAGE BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 88, VOLUME 5, IN 2015 RSBS.

Ducts In Garage	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Some Visible Penetrations	44.4%	23.5%	0.0%	0.0%	44.2%	23.2%
Well-Sealed	51.9%	23.6%	100.0%	0.0%	52.1%	23.2%
Respondents (n)	19	19	4	4	23	23

Note: This table reports the results of field inspector visual inspection.

Source: On-site fields: ['Building Envelope Connection Duct', 'Construction Type'].

TABLE 136. CEILING TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 91, VOLUME 5, IN 2015 RSBS.

Ceiling Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Flat Under Attic	70.8%	7.4%	78.6%	4.1%	82.1%	6.4%	75.4%	3.9%
Closed Slant	13.5%	5.3%	11.8%	3.1%	7.8%	3.7%	12.0%	2.8%
Vaulted Under Attic	8.6%	4.5%	6.8%	2.6%	7.2%	4.6%	7.7%	2.4%
Open Slant	3.5%	3.0%	1.8%	1.1%	0.0%	0.1%	2.3%	1.5%
Below Other Living Unit	3.5%	3.3%	1.0%	1.1%	2.8%	3.3%	2.5%	1.7%
Observations (n)	122	122	376	376	125	125	623	623

Note: This table estimates the distribution of ceiling type by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the percentage of each type of ceiling. Comparisons cannot be made with the corresponding table in the 2015 RSBS because ceiling types do not map directly to 2015 RSBS values.

Source: On-site fields: ['Percentage of Surface Type', 'Ceiling Type', 'Climate Zone'].

TABLE 137. CEILING TYPE BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 92, VOLUME 5, IN 2015 RSBS.

Ceiling Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Flat Under Attic	75.5%	3.9%	70.3%	7.5%	75.4%	3.9%
Closed Slant	12.0%▲	2.8%	12.6%	5.5%	12.0%▲	2.8%
Vaulted Under Attic	7.7%▼	2.4%	5.3%▼	3.3%	7.7%▼	2.4%
Open Slant	2.3%	1.5%	11.8%	5.3%	2.3%	1.5%
Below Other Living Unit	2.5%	1.7%	0.0%	0.0%	2.5%	1.7%
Ceiling Type (n)	513	513	110	110	623	623

Note: This table estimates the distribution of ceiling type by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the percentage of each type of ceiling. Comparisons cannot be made with the corresponding table in the 2015 RSBS because ceiling types do not map directly to 2015 RSBS values.

Source: On-site fields: ['Percentage of Surface Type', 'Ceiling Type', 'Construction Type'].

TABLE 138. CEILING INSULATION THICKNESS BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 113, VOLUME 5, IN 2015 RSBS.

Inches	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	11.2%▲	5.4%	5.3%▲	2.4%	0.1%	0.2%	7.3%▲	2.7%
1.0 to 3.0	13.6%	6.0%	6.6%	2.6%	5.2%	4.3%	9.8%	3.1%
3.5 to 5.0	13.4%	5.6%	6.7%▼	2.5%	5.1%▼	4.2%	9.6%▼	2.9%
5.5 to 8.0	43.2%	8.2%	35.5%▼	5.1%	35.4%	8.7%	39.1%▼	4.5%
9.0 to 12.0	13.9%	5.8%	30.7%▲	5.0%	34.5%	8.8%	23.3%	3.7%
13.0 to 16.0	3.5%	3.1%	11.2%▲	3.4%	14.7%	6.7%	8.1%▲	2.2%
17.0 to 20.0	1.2%	2.0%	4.0%	2.2%	2.2%	2.6%	2.4%	1.3%
21.0 to 24.0	0.0%	0.0%	0.0%▼	0.0%	2.8%	2.8%	0.4%	0.4%
Insulation thickness (n)	119	119	367	367	122	122	608	608

Note: This table estimates the distribution of ceiling interior or cavity insulation by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the distribution of insulation thickness.

Source: On-site fields: ['Interior or Cavity Insulation Thickness (Inches)', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

BACK TO REPORT

TABLE 139. EXISTING HOMES: CEILING INSULATION THICKNESS (SITE)

COMPARE WITH TABLE 114, VOLUME 5, IN 2015 RSBS.

Inches	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	11.2%▲	5.4%	5.4%▲	2.4%	0.1%	0.2%	7.4%▲	2.8%
1.0 to 3.0	13.6%	6.0%	6.7%	2.6%	5.3%	4.4%	9.8%	3.1%
3.5 to 5.0	13.4%	5.6%	6.8%▼	2.5%	5.1%▼	4.2%	9.7%▼	2.9%
5.5 to 8.0	43.2%	8.2%	35.8%	5.2%	35.6%	8.8%	39.3%	4.6%
9.0 to 12.0	13.9%	5.8%	30.6%	5.0%	34.4%	8.9%	23.2%	3.7%
13.0 to 16.0	3.5%	3.1%	10.9%▲	3.5%	14.6%	6.8%	7.9%▲	2.2%
17.0 to 20.0	1.2%	2.0%	4.0%	2.2%	2.1%	2.6%	2.4%	1.3%
21.0 to 24.0	0.0%	0.0%	0.0%	0.0%	2.8%	2.9%	0.4%	0.4%
Insulation thickness (n)	119	119	283	283	97	97	499	499

Note: This table estimates the distribution of ceiling interior or cavity insulation thickness by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the distribution of insulation thickness.

Source: On-site fields: ['Interior or Cavity Insulation Thickness (Inches)', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 140. NEW HOMES: CEILING INSULATION THICKNESS (SITE)

COMPARE WITH TABLE 115, VOLUME 5, IN 2015 RSBS.

Inches	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	0.0%	0.0%	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
1.0 to 3.0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
3.5 to 5.0	0.0%	0.0%	0.0%	0.0%	0.5%▼	0.8%	0.1%▼	0.2%
5.5 to 8.0	0.0%	0.0%	7.1%	4.6%	18.5%	14.3%	10.2%	5.2%
9.0 to 12.0	100.0%	0.0%	43.5%▼	9.6%	41.7%	17.7%	43.0%	8.4%
13.0 to 16.0	0.0%	0.0%	40.8%▲	9.6%	25.5%	15.7%	36.6%▲	8.2%
17.0 to 20.0	0.0%	0.0%	5.7%	4.6%	13.9%	12.8%	7.9%	4.8%
21.0 to 24.0	0.0%	0.0%	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
Insulation thickness (n)	5	5	84	84	25	25	109	109

Note: This table estimates the distribution of ceiling interior or cavity insulation thickness by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the distribution of insulation thickness.

[a] *Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.*

Source: On-site fields: ['Interior or Cavity Insulation Thickness (Inches)', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 141. CEILING INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 116, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	68.9%	7.8%	49.7%▼	5.4%	61.1%	9.0%	60.6%	4.5%
Cellulose	8.2%	4.8%	23.1%	4.6%	23.9%	7.9%	16.1%	3.2%
Fiberglass Fill	6.3%	4.1%	14.9%▲	3.9%	10.4%	5.8%	10.1%▲	2.6%
None	11.2%	5.4%	5.3%	2.4%	0.1%▼	0.2%	7.3%	2.7%
Spray Foam	0.6%	1.0%	1.6%	1.3%	0.4%▼	0.5%	0.9%	0.7%
Other	3.0%	2.5%	0.8%	1.0%	0.0%	0.0%	1.7%	1.3%
Vermiculite	0.0%	0.0%	1.3%	1.2%	2.2%	2.7%	0.8%	0.6%
Rock Wool	0.6%▼	1.0%	0.7%	0.8%	1.5%	2.4%	0.8%▼	0.7%
XPS	0.0%	0.0%	0.5%	0.8%	0.0%▼	0.1%	0.2%	0.3%
Polyisocyanurate	1.2%	2.0%	0.5%	0.8%	0.4%	0.7%	0.8%	1.0%
Fiberglass - Combo	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%▼	0.3%
Spray Foam - Combo[a]	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Vermiculite - Combo	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Observations (n)	119	119	365	365	121	121	605	605

Note: This table estimates ceiling interior or cavity insulation type by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the distribution of insulation type.

[a] *The spray foam - combo insulation type was not represented in the corresponding table in the 2015 RSBS.*

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 142. EXISTING HOMES: CEILING INSULATION TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 117, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	68.9%	7.8%	49.7%▼	5.4%	61.3%	9.1%	60.7%	4.5%
Cellulose	8.2%	4.8%	23.2%	4.7%	23.8%	8.0%	16.1%	3.2%
Fiberglass Fill	6.3%	4.1%	14.7%▲	4.0%	10.3%	5.9%	10.0%▲	2.6%
None	11.2%	5.4%	5.4%	2.4%	0.1%▼	0.2%	7.4%	2.8%
Vermiculite	0.0%	0.0%	1.4%	1.2%	2.2%	2.7%	0.8%	0.6%
Other	3.0%	2.5%	0.8%	1.0%	0.0%	0.0%	1.7%	1.3%
Spray Foam	0.6%	1.0%	1.5%	1.3%	0.3%▼	0.5%	0.9%	0.7%
Rock Wool	0.6%▼	1.0%	0.8%	0.8%	1.5%	2.4%	0.8%▼	0.7%
Polyisocyanurate	1.2%	2.0%	0.5%	0.8%	0.4%	0.7%	0.8%	1.0%
Fiberglass - Combo	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Spray Foam - Combo[a]	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Vermiculite - Combo	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
XPS	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Observations (n)	119	119	281	281	97	97	497	497

Note: This table estimates ceiling interior or cavity insulation type by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the distribution of insulation type.

[a] *The spray foam - combo insulation type was not represented in the corresponding table in the 2015 RSBS.*

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 143. NEW HOMES: CEILING INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 118, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	**80.0%**	**42.3%**	51.3%	9.7%	38.1%	17.9%	47.6%	8.5%
Fiberglass Fill	**0.0%**	**0.0%**	29.3%	8.9%	19.0%	14.7%	26.4%	7.6%
Cellulose	**0.0%**	**0.0%**	9.1%	5.6%	28.1%	16.3%	14.4%	6.1%
Spray Foam	**20.0%**	**42.3%**	8.8%	5.4%	9.5%	11.0%	9.0%	4.9%
None	**0.0%**	**0.0%**	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
XPS	**0.0%**	**0.0%**	0.0%	0.0%	4.8%	8.0%	1.3%	2.2%
Polyisocyanurate	**0.0%**	**0.0%**	0.0%	0.0%	0.5%	0.8%	0.1%	0.2%
Observations (n)	5	5	84	84	24	24	108	108

Note: This table estimates ceiling interior or cavity insulation type by area. The number of observations equals the number of ceiling segments defined in the data. More than one type of ceiling may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the distribution of insulation type.

[a] *Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.*

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 144. CEILING INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 133, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	4.2%	3.5%	18.6%▲	4.3%	11.6%	5.9%	10.9%	2.5%
Grade II	41.8%	8.7%	52.7%	5.5%	52.6%	9.2%	47.7%	4.7%
Grade III	34.6%	8.4%	17.4%▼	3.9%	29.1%	8.6%	27.2%▼	4.4%
Sub Grade III	19.3%	7.3%	11.3%	3.5%	6.7%	4.6%	14.2%	3.7%
Observations (n)	107	107	347	347	122	122	576	576

Note: This table estimates ceiling interior or cavity insulation grade by area. The number of observations equals the number of insulated ceiling segments with known insulation grades defined in the data. More than one ceiling segment may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the percentage values for each insulation grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 145. EXISTING HOMES: CEILING INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 134, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	4.2%	3.5%	18.1%▲	4.3%	11.0%	5.9%	10.5%	2.6%
Grade II	41.8%	8.7%	53.2%	5.5%	53.0%	9.3%	47.9%	4.8%
Grade III	34.6%	8.4%	17.3%▼	4.0%	29.2%	8.7%	27.2%▼	4.4%
Sub Grade III	19.3%	7.3%	11.5%	3.5%	6.8%	4.7%	14.3%	3.7%
Observations (n)	107	107	266	266	96	96	469	469

Note: This table estimates ceiling interior or cavity insulation grade by area. The number of observations equals the number of insulated ceiling segments with known insulation grades defined in the data. More than one ceiling segment may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the percentage values for each insulation grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 146. NEW HOMES: CEILING INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 135, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	**40.0%**	**51.8%**	70.7%▲	8.9%	70.9%▲	16.0%	70.7%▲	7.7%
Grade II	**60.0%**	**51.8%**	3.9%▼	3.5%	9.1%▼	10.5%	5.4%▼	3.9%
Grade III	**0.0%**	**0.0%**	25.4%	8.6%	20.0%	13.8%	23.9%	7.2%
Observations (n)	5	5	81	81	26	26	107	107

Note: This table estimates ceiling interior or cavity insulation grade by area. The number of observations equals the number of insulated ceiling segments with known insulation grades defined in the data. More than one ceiling segment may be defined per home. Each segment includes an indication of the percentage of ceiling space it accounts for in that home, which was applied to each segment in calculating the percentage values for each insulation grade.
[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 147. FOUNDATION TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 89, VOLUME 5, IN 2015 RSBS.

Foundation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Conditioned Basement	50.6%	8.5%	31.3%	5.1%	28.9%	8.6%	40.1%	4.8%
Unconditioned Basement	18.0%	6.5%	36.0%	5.3%	38.7%	9.3%	27.8%	4.0%
Indirectly Conditioned Basement	19.5%	7.0%	23.5%	4.7%	15.2%	6.8%	20.3%	3.9%
Slab on Grade	6.7%	4.1%	4.0%	2.0%	10.8%	6.0%	6.3%	2.3%
Unvented Crawlspace	4.5%	2.7%	3.2%	1.6%	3.2%	2.9%	3.8%	1.5%
Vented Crawlspace	0.7%▼	1.0%	2.0%	1.3%	3.2%▼	3.4%	1.6%▼	0.9%
Respondents (n)	83	83	268	268	90	90	441	441

Note: This table estimates the distribution of foundation type by area. The number of observations equals the number of foundation segments defined in the data. Each segment defined for a home includes an indication of the percentage of the total surface of that type it accounts for in that home, which was applied to each segment in calculating the distribution of foundation type.

Source: On-site fields: ['Envelope Foundation Space Type', 'Energy Path Description', 'Equipment Category', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 148. FOUNDATION TYPE BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 90, VOLUME 5, IN 2015 RSBS.

Foundation Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Conditioned Basement	40.0%	4.8%	55.3%	8.7%	40.1%	4.8%
Unconditioned Basement	27.9%	4.1%	8.9%	5.0%	27.8%	4.0%
Indirectly Conditioned Basement	20.3%	3.9%	24.8%	7.5%	20.3%	3.9%
Slab on Grade	6.3%	2.3%	9.7%	5.2%	6.3%	2.3%
Unvented Crawlspace	3.8%	1.5%	1.3%	2.1%	3.8%	1.5%
Vented Crawlspace	1.6%▼	0.9%	0.0%	0.0%	1.6%▼	0.9%
Respondents (n)	353	353	88	88	441	441

Note: This table estimates the distribution of foundation type by area. The number of observations equals the number of foundation segments defined in the data. Each segment defined for a home includes an indication of the percentage of the total surface of that type it accounts for in that home, which was applied to each segment in calculating the distribution of foundation type.

Source: On-site fields: ['Envelope Foundation Space Type', 'Energy Path Description', 'Equipment Category', 'Percentage of Surface Type', 'Construction Type'].

TABLE 149. FOUNDATION WALL INTERIOR/CAVITY INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 42, VOLUME 1, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	58.2%▼	8.7%	70.0%	5.0%	71.4%	9.0%	64.5%▼	4.8%
Fiberglass Batts	37.9%▲	8.6%	24.8%	4.7%	17.0%	7.5%	30.0%▲	4.7%
Spray Foam	1.6%	2.2%	0.4%	0.5%	3.3%	3.8%	1.4%	1.2%
XPS	0.0%	0.0%	1.4%	1.1%	3.3%	3.8%	1.0%	0.7%
EPS	2.3%	2.6%	0.1%▼	0.1%	3.3%	3.8%	1.6%	1.4%
Polyisocyanurate	0.0%	0.0%	1.4%	1.3%	1.1%	1.5%	0.7%	0.5%
Fiberglass Blanket	0.0%	0.0%	1.4%	1.3%	0.0%	0.0%	0.5%▼	0.5%
Fiberglass Fill	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Mineral Wool	0.0%	0.0%	0.0%	0.0%	0.5%	0.8%	0.1%	0.1%
Cellulose	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.1%
Observations (n)	101	101	323	323	99	99	523	523

Note: This table estimates the distribution of foundation interior or cavity insulation type by area. The number of observations equals the number of foundation segments with known insulation values defined in the data. More than one type of foundation may be defined per home. Each segment includes an indication of the percentage of foundation area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

BACK TO REPORT

TABLE 150. FOUNDATION WALL EXTERIOR/CONTINUOUS INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 42, VOLUME 1, IN 2015 RSBS.

insulation type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	98.7%▲	2.1%	96.7%▲	2.0%	91.6%▲	5.5%	96.9%▲	1.5%
XPS	0.0%	0.0%	1.6%	1.5%	5.0%	4.2%	1.3%	0.8%
EPS	1.3%	2.1%	0.5%	0.8%	1.7%	2.7%	1.1%	1.1%
Polyisocyanurate	0.0%	0.0%	1.1%	1.2%	1.7%	2.7%	0.7%	0.6%
Insulation Type (n)	99	99	322	322	99	99	520	520

Note: This table estimates the distribution of foundation exterior insulation type by area. The number of observations equals the number of foundation segments with known insulation values defined in the data. More than one type of foundation may be defined per home. Each segment includes an indication of the percentage of foundation area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

Source: On-site fields: ['Ext or Continuous Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 151. FOUNDATION WALL INTERIOR/CAVITY INSULATION TYPE BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 43, VOLUME 1, IN 2015 RSBS.

Insulation Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
None	64.7%▼	4.8%	22.1%	7.7%	64.5%▼	4.8%
Fiberglass Batts	29.9%▲	4.7%	56.7%▲	9.2%	30.0%▲	4.7%
EPS	1.6%	1.4%	2.6%	3.1%	1.6%	1.4%
Spray Foam	1.4%	1.2%	8.9%	5.4%	1.4%	1.2%
XPS	1.0%	0.7%	8.5%	5.1%	1.0%	0.7%
Polyisocyanurate	0.7%	0.5%	0.0%	0.0%	0.7%	0.5%
Fiberglass Blanket	0.5%	0.5%	0.0%	0.0%	0.5%▼	0.5%
Fiberglass Fill	0.2%	0.3%	1.2%	2.0%	0.2%	0.3%
Mineral Wool	0.1%	0.1%	0.0%	0.0%	0.1%	0.1%
Cellulose	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
Observations (n)	438	438	85	85	523	523

Note: This table estimates the distribution of foundation interior or cavity insulation type by area. The number of observations equals the number of foundation segments with known insulation values defined in the data. More than one type of foundation may be defined per home. Each segment includes an indication of the percentage of foundation area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Construction Type'].

TABLE 152. FOUNDATION WALL EXTERIOR/CONTINUOUS INSULATION TYPE BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 43, VOLUME 1, IN 2015 RSBS.

Insulation Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
None	97.0%▲	1.5%	84.4%▲	6.9%	96.9%▲	1.5%
XPS	1.3%	0.8%	10.1%	5.7%	1.3%	0.8%
EPS	1.0%	1.1%	2.9%	3.3%	1.1%	1.1%
Polyisocyanurate	0.7%	0.6%	2.6%	3.1%	0.7%	0.6%
Observations (n)	435	435	85	85	520	520

Note: This table estimates the distribution of foundation exterior insulation type by area. The number of observations equals the number of foundation segments with known insulation values defined in the data. More than one type of foundation may be defined per home. Each segment includes an indication of the percentage of foundation area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each insulation type.

Source: On-site fields: ['Ext or Continuous Insulation Type', 'Percentage of Surface Type', 'Construction Type'].

TABLE 153. FOUNDATION WALL INTERIOR/CAVITY INSULATION TYPE AND GRADE (SITE)

COMPARE WITH TABLE 94, VOLUME 5, IN 2015 RSBS.

Insulation Type	Grade I		Grade II		Grade III		Sub Grade III		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	50.6%	19.4%	89.4%▲	5.5%	92.3%	11.3%	99.5%▲	1.2%	85.8%▲	5.5%
EPS	19.7%	17.3%	0.0%	0.0%	7.0%	11.3%	0.5%	1.2%	4.5%	3.9%
Spray Foam	24.1%	19.1%	1.3%	2.2%	0.1%	0.1%	0.0%	0.0%	4.1%	3.3%
XPS	4.7%▼	5.1%	4.0%▼	3.6%	0.7%▼	1.2%	0.0%	0.0%	2.9%▼	2.0%
Polyisocyanurate	0.8%▼	1.3%	2.5%	2.4%	0.0%	0.0%	0.0%	0.0%	1.4%▼	1.2%
Fiberglass Blanket	0.0%	0.0%	1.1%▼	1.8%	0.0%	0.0%	0.0%	0.0%	0.5%▼	0.9%
Fiberglass Fill	0.1%	0.2%	1.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.5%	0.8%
Mineral Wool	0.0%	0.0%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	0.2%	0.3%
Cellulose	0.0%	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Observations (n)	68	68	86	86	37	37	10	10	201	201

Note: This table estimates the distribution of foundation interior or cavity insulation grade by insulation type by area. The number of observations equals the number of foundation segments with known insulation grade and type values defined in the data. More than one type of foundation may be defined per home. Each segment includes an indication of the percentage of foundation area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each insulation type and grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type'].

TABLE 154. EXISTING HOMES: FOUNDATION WALL INTERIOR/CAVITY INSULATION TYPE AND GRADE (SITE)

COMPARE WITH TABLE 95, VOLUME 5, IN 2015 RSBS.

Insulation Type	Grade I		Grade II		Grade III		Sub Grade III		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	49.7%	21.2%	89.4%▲	5.5%	92.3%	11.6%	99.5%▲	1.2%	85.9%▲	5.6%
EPS	20.5%	19.0%	0.0%	0.0%	7.0%	11.6%	0.5%	1.2%	4.5%	3.9%
Spray Foam	24.8%	21.0%	1.3%	2.2%	0.0%	0.0%	0.0%	0.0%	4.0%	3.4%
XPS	4.1%▼	5.6%	4.0%▼	3.6%	0.7%▼	1.2%	0.0%	0.0%	2.8%▼	2.0%
Polyisocyanurate	0.8%▼	1.5%	2.5%	2.4%	0.0%	0.0%	0.0%	0.0%	1.4%▼	1.2%
Fiberglass Blanket	0.0%	0.0%	1.1%▼	1.8%	0.0%	0.0%	0.0%	0.0%	0.6%▼	0.9%
Fiberglass Fill	0.0%	0.0%	1.0%	1.6%	0.0%	0.0%	0.0%	0.0%	0.5%	0.8%
Mineral Wool	0.0%	0.0%	0.4%	0.7%	0.0%	0.0%	0.0%	0.0%	0.2%	0.3%
Cellulose	0.0%	0.0%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Observations (n)	23	23	76	76	27	27	10	10	136	136

Note: This table estimates the distribution of foundation interior or cavity insulation grade by insulation type by area. The number of observations equals the number of foundation segments with known insulation grade and type values defined in the data. More than one type of foundation may be defined per home. Each segment includes an indication of the percentage of foundation area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each insulation type and grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type'].

TABLE 155. NEW HOMES: FOUNDATION WALL INTERIOR/CAVITY INSULATION TYPE AND GRADE (SITE)

COMPARE WITH TABLE 96, VOLUME 5, IN 2015 RSBS.

Insulation Type	Grade I		Grade II		Grade III		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	65.7%	12.2%	89.1%	22.1%	88.9%	22.5%	72.3%	9.6%
Spray Foam	11.9%	8.5%	10.9%	22.1%	11.1%	22.5%	11.6%	7.0%
XPS	15.5%	9.2%	0.0%	0.0%	0.0%	0.0%	11.0%	6.7%
EPS	4.8%	5.7%	0.0%	0.0%	0.0%	0.0%	3.5%	4.1%
Fiberglass Fill	2.2%	3.7%	0.0%	0.0%	0.0%	0.0%	1.6%	2.6%
Observations (n)	45	45	10	10	10	10	65	65

Note: This table estimates the distribution of foundation interior or cavity insulation grade by insulation type by area. The number of observations equals the number of foundation segments with known insulation grade and type values defined in the data. More than one type of foundation may be defined per home. Each segment includes an indication of the percentage of foundation area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each insulation type and grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type'].

TABLE 156. FLOOR INSULATION THICKNESS BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Insulation Inches	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	13.2%	21.3%	29.9%	15.0%	0.0%	0.0%	16.8%	11.0%
1.0 to 3.0	1.3%	2.4%	1.5%	2.5%	14.9%	19.1%	3.7%	3.7%
3.5 to 5.0	0.0%	0.0%	20.4%	13.5%	22.9%	24.1%	11.2%	7.1%
5.5 to 8.0	85.5%	21.3%	44.2%	15.8%	49.2%	27.0%	64.5%	12.8%
9.0 to 12.0	0.0%	0.0%	4.1%	3.4%	13.1%	18.5%	3.7%	3.5%
Observations (n)	15	15	74	74	22	22	111	111

Note: This table represents floor interior or cavity insulation thickness by area in floors over the outside, over vented crawlspaces, and over garages. The number of observations equals the number of floor segments with known insulation thickness values defined in the data. More than one floor segment may be defined per home. Each segment includes an indication of the percentage of floor area of that type it accounts for in that home, which was applied to each segment in calculating the percentage of each floor insulation thickness. This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Interior or Cavity Insulation Thickness (Inches)', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

BACK TO REPORT

TABLE 157. FLOOR INSULATION TYPE AND GRADE (SITE)

COMPARE WITH TABLE 46, VOLUME 1, IN 2015 RSBS.

Insulation Type	Grade I		Grade II		Grade III		Sub Grade III		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	56.9%	32.8%	90.4%▲	7.7%	92.8%	8.7%	93.5%	8.9%	89.3%▲	5.4%
Fiberglass Fill	16.3%	24.7%	3.7%	5.4%	0.0%	0.0%	0.0%	0.0%	2.8%	3.0%
Other	5.0%	8.8%	2.6%	4.3%	0.0%	0.0%	4.1%	7.5%	2.2%	2.4%
Cellulose	21.2%	30.7%	0.9%	1.6%	0.0%	0.0%	0.0%	0.0%	1.9%	2.5%
Spray Foam	0.1%▼	0.2%	0.0%	0.0%	4.8%	7.9%	0.0%	0.0%	1.4%	2.4%
EPS[a]	0.0%	0.0%	0.8%	1.4%	0.0%	0.0%	2.5%	4.6%	0.8%	1.0%
Radiant Barrier[a]	0.5%	0.9%	0.0%	0.0%	2.4%	4.0%	0.0%	0.0%	0.8%	1.2%
XPS	0.0%	0.0%	1.6%	2.6%	0.0%	0.0%	0.0%	0.0%	0.7%▼	1.2%
Observations (n)	30	30	50	50	47	47	16	16	143	143

Note: This table represents floor interior or cavity insulation type and grade in all floor surfaces by area. The number of observations equals the number of floor segments with known insulation type and grade defined in the data. More than one floor segment may be defined per home. Each segment includes an indication of the percentage of floor area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation and insulation grade.

[a] EPS and radiant barrier were not represented in the corresponding table in the 2015 RSBS.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type'].

TABLE 158. EXISTING HOMES: FLOOR INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 99, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	13.9%	14.8%	6.8%	5.4%	13.5%	15.1%	11.3%	7.2%
Grade II	51.6%	21.5%	39.4%	12.8%	33.3%	18.9%	43.5%	10.9%
Grade III	21.3%	16.9%	31.4%	12.5%	39.1%	20.2%	28.6%▼	9.5%
Sub Grade III	13.1%	15.3%	22.4%	11.6%	14.1%	13.0%	16.7%	8.1%
Observations (n)	22	22	54	54	24	24	100	100

Note: This table represents floor interior or cavity insulation grade in all floor surfaces by area. The number of observations equals the number of floor segments with known insulation type and grade defined in the data. More than one floor segment may be defined per home. Each segment includes an indication of the percentage of floor area it accounts for in that home, which was applied to each segment in calculating the percentage of insulation of each grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 159. NEW HOMES: FLOOR INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 100, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	**50.0%**	**57.5%**	40.2%	16.7%	50.0%	36.2%	42.8%▲	15.1%
Grade II	**18.8%**	**41.3%**	8.5%▼	9.6%	25.0%	29.5%	12.9%▼	10.0%
Grade III	**31.3%**	**52.0%**	50.3%	17.2%	25.0%	31.1%	43.5%	15.1%
Sub Grade III	**0.0%**	**0.0%**	1.0%	1.7%	0.0%	0.0%	0.7%	1.3%
Observations (n)	5	5	36	36	9	9	45	45

Note: This table represents floor interior or cavity insulation grade in all floor surfaces by area. The number of observations equals the number of floor segments with known insulation type and grade defined in the data. More than one floor segment may be defined per home. Each segment includes an indication of the percentage of floor area it accounts for in that home, which was applied to each segment in calculating the percentage of insulation of each grade.
[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 160. NEW HOMES: FLOOR INSULATION TYPE AND GRADE (SITE)

COMPARE WITH TABLE 104, VOLUME 5, IN 2015 RSBS.

Insulation Type	Grade I		Grade II		Grade III		Sub Grade III		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	78.5%▲	19.6%	100.0%	0.0%	91.5%	14.8%	100.0%	0.0%	87.1%	10.3%
Radiant Barrier[a]	8.6%	14.5%	0.0%	0.0%	8.5%	14.8%	0.0%	0.0%	7.4%	8.5%
Fiberglass Fill	8.6%	14.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	3.7%	6.2%
Spray Foam	2.6%▼	3.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.1%▼	1.4%
Cellulose[a]	1.7%	3.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.7%	1.3%
Observations (n)	22	22	6	6	16	16	1	1	45	45

Note: This table represents floor interior or cavity insulation type and grade in all floor surfaces by area. The number of observations equals the number of floor segments with known insulation type and grade defined in the data. More than one floor segment may be defined per home. Each segment includes an indication of the percentage of floor area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation and insulation grade.

[a] *The cellulose and radiant barrier insulation types were not represented in the corresponding table of the 2015 RSBS.*

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type'].

TABLE 161. WALL INTERIOR/CAVITY INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 44, VOLUME 1, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	60.0%	8.3%	65.9%	5.3%	75.0%	8.3%	64.5%	4.6%
None	28.9%	7.7%	17.8%▲	4.2%	9.0%	5.4%	21.7%	4.1%
Cellulose	5.0%	3.8%	12.0%	3.7%	9.8%	5.8%	8.3%	2.4%
Fiberglass Fill	2.4%	2.8%	0.5%	0.8%	3.8%	3.6%	1.9%	1.5%
Spray Foam[a]	1.7%	2.1%	1.7%	1.4%	2.3%	2.6%	1.8%	1.2%
Polyisocyanurate	1.2%	2.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.9%
Rock Wool	0.0%	0.0%	0.7%	0.9%	0.1%▼	0.1%	0.3%	0.3%
UFFI[a]	0.7%	1.2%	0.0%	0.0%	0.0%	0.0%	0.3%	0.6%
Other	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Vermiculite	0.1%▼	0.2%	0.3%	0.4%	0.0%	0.0%	0.2%▼	0.2%
XPS	0.0%	0.0%	0.5%	0.6%	0.0%	0.0%	0.2%	0.2%
Spray Foam - Combo	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Observations (n)	117	117	316	316	107	107	540	540

Note: This table estimates the distribution of interior or cavity wall insulation type by area. The number of observations equals the number of wall segments with known insulation type defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

[a] The UFFI and spray foam - combo insulation types were not represented in the corresponding table in the 2015 RSBS.

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

BACK TO REPORT

TABLE 162. WALL EXTERIOR/CONTINUOUS INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 44E, VOLUME 1, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	75.1%▲	7.6%	93.6%▲	2.8%	83.9%▲	7.2%	83.3%▲	4.0%
EPS	22.4%▲	7.3%	2.0%	1.6%	10.2%▲	6.0%	13.0%▲	3.7%
Polyisocyanurate	2.5%	2.9%	1.7%	1.4%	1.5%	2.4%	2.1%	1.5%
XPS	0.0%	0.0%	2.6%	1.8%	4.3%	4.0%	1.6%	0.9%
Cellulose Dense Pack[a]	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Mineral Wool Board[a]	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
Spray Foam	0.0%	0.0%	0.1%▼	0.1%	0.0%	0.0%	0.0%▼	0.0%
Observations (n)	110	110	309	309	106	106	525	525

Note: This table estimates the distribution of exterior or continuous wall insulation type by area. The number of observations equals the number of wall segments with known exterior or continuous insulation type defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.
[a] The cellulose dense pack and mineral wool board insulation types were not represented in the corresponding table in the 2015 RSBS.

Source: On-site fields: ['Ext or Continuous Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 163. EXISTING HOMES: WALL INTERIOR/CAVITY INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 108, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	60.0%	8.3%	65.7%	5.3%	75.1%	8.4%	64.4%	4.6%
None	28.9%	7.7%	18.0%	4.3%	9.0%	5.5%	21.8%	4.1%
Cellulose	5.0%	3.8%	12.1%	3.7%	9.9%	5.9%	8.4%	2.5%
Fiberglass Fill	2.4%	2.8%	0.5%	0.8%	3.9%	3.7%	1.9%	1.5%
Spray Foam	1.7%	2.1%	1.6%	1.4%	2.1%	2.6%	1.7%	1.2%
Polyisocyanurate	1.2%	2.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.9%
Rock Wool	0.0%	0.0%	0.7%	0.9%	0.0%	0.0%	0.3%	0.3%
UFFI[a]	0.7%	1.2%	0.0%	0.0%	0.0%	0.0%	0.3%	0.6%
Other	0.0%	0.0%	0.5%▼	0.8%	0.0%	0.0%	0.2%▼	0.3%
XPS	0.0%	0.0%	0.5%	0.6%	0.0%	0.0%	0.2%	0.2%
Vermiculite	0.1%	0.2%	0.3%	0.4%	0.0%	0.0%	0.2%	0.2%
Observations (n)	117	117	238	238	78	78	433	433

Note: This table estimates the distribution of interior or cavity wall insulation type by area. The number of observations equals the number of wall segments with known insulation type defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

[a] *The UFFI insulation type was not represented in the equivalent table in the 2015 RSBS.*

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 164. EXISTING HOMES: WALL EXTERIOR/CONTINUOUS INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 108E, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	75.1%▲	7.6%	93.2%▲	2.9%	84.1%▲	7.3%	83.1%▲	4.0%
EPS	22.4%▲	7.3%	2.0%	1.7%	10.1%▲	6.0%	13.0%▲	3.8%
Polyisocyanurate	2.5%	2.9%	1.7%	1.4%	1.4%	2.4%	2.0%	1.5%
XPS	0.0%	0.0%	2.5%	1.8%	4.3%	4.1%	1.6%▲	0.9%
Other	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%▼	0.3%
Spray Foam	0.0%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%▼	0.0%
Observations (n)	110	110	231	231	77	77	418	418

Note: This table estimates the distribution of exterior or continuous wall insulation type by area. The number of observations equals the number of wall segments with known exterior or continuous insulation type defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

Source: On-site fields: ['Ext or Continuous Insulation Type', 'Percentage of Surface Type', 'Interior or Cavity Insulation Type', 'Climate Zone'].

TABLE 165. NEW HOMES: WALL INTERIOR/CAVITY INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 45, VOLUME 1, IN 2015 RSBS.

Insulation Type	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	**80.0%**	**37.8%**	86.0%	6.7%	61.4%	16.8%	79.1%	6.9%
Spray Foam	**20.0%**	**37.8%**	8.1%	5.3%	20.9%	14.3%	11.7%▼	5.5%
None	**0.0%**	**0.0%**	1.5%	1.7%	8.6%	9.1%	3.5%	2.8%
Rock Wool	**0.0%**	**0.0%**	0.0%	0.0%	9.1%	9.7%	2.5%	2.7%
Spray Foam/Cellulose[b]	**0.0%**	**0.0%**	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
Spray Foam/Fiberglass[b]	**0.0%**	**0.0%**	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
Cellulose	**0.0%**	**0.0%**	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
Observations (n)	6	6	78	78	29	29	107	107

Note: This table estimates the distribution of interior or cavity wall insulation type by area. The number of observations equals the number of wall segments with known insulation type defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

[b] The spray foam/cellulose and spray foam/fiberglass insulation types were not represented in the equivalent table in the 2015 RSBS.

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 166. NEW HOMES: WALL EXTERIOR/CONTINUOUS INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 45E, VOLUME 1, IN 2015 RSBS.

Insulation Type	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	**40.0%**	**45.3%**	82.9%▲	7.4%	70.5%▲	15.8%	79.4%▲	6.9%
EPS	**60.0%**	**45.3%**	4.4%	3.8%	12.7%	11.1%	6.7%	4.1%
XPS	**0.0%**	**0.0%**	8.2%	5.5%	0.0%	0.0%	5.9%	4.0%
Polyisocyanurate	**0.0%**	**0.0%**	4.4%	4.2%	8.6%	10.0%	5.6%	4.1%
Cellulose Dense Pack[b]	**0.0%**	**0.0%**	0.0%	0.0%	4.5%	7.6%	1.3%	2.1%
Mineral Wool Board[b]	**0.0%**	**0.0%**	0.0%	0.0%	3.6%	6.1%	1.0%	1.7%
Observations (n)	6	6	78	78	29	29	107	107

Note: This table estimates the distribution of exterior or continuous wall insulation type by area. The number of observations equals the number of wall segments with known exterior or continuous insulation type defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

[b] The cellulose dense pack and mineral wool board insulation types were not represented in the 2015 RSBS.

Source: On-site fields: ['Ext or Continuous Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 167. WALL INTERIOR/CAVITY INSULATION THICKNESS BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 109, VOLUME 5, IN 2015 RSBS.

Inches of Insulation	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	28.9%	7.7%	17.8%	4.2%	9.0%	5.4%	21.7%	4.1%
0.5	1.2%	2.0%	0.2%▼	0.3%	0.0%	0.0%	0.6%	0.9%
1	0.0%	0.0%	0.5%▼	0.6%	0.0%	0.0%	0.2%▼	0.2%
1.5	3.6%	3.4%	1.5%	1.4%	0.0%	0.0%	2.2%	1.7%
2	1.3%▼	2.0%	3.2%	2.0%	5.2%	4.3%	2.6%▼	1.4%
2.5	3.9%	3.4%	1.2%	1.2%	0.0%	0.0%	2.3%	1.7%
3	2.1%	2.5%	4.4%	2.4%	0.0%▼	0.1%	2.7%	1.5%
3.5	48.7%▼	8.5%	49.8%▲	5.6%	48.0%	9.6%	49.0%	4.8%
4	0.7%▼	1.2%	0.5%▼	0.8%	0.0%▼	0.1%	0.5%▼	0.6%
4.5	1.2%	2.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.9%
5.5	8.3%	4.8%	19.5%▼	4.3%	37.6%	9.3%	17.0%▼	3.3%
6.5	0.0%	0.0%	0.0%▼	0.0%	0.0%	0.0%	0.0%▼	0.0%
8	0.0%	0.0%	1.5%	1.3%	0.0%	0.0%	0.5%	0.5%
10.5	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
11	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Observations (n)	117	117	316	316	107	107	540	540

Note: This table estimates the distribution of interior or cavity wall insulation thickness by area. The number of observations equals the wall segments with known insulation thickness values defined in the data. More than one segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the distribution of insulation thickness.

Source: On-site fields: ['Interior or Cavity Insulation Thickness (Inches)', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 168. EXISTING HOMES: WALL INTERIOR/CAVITY INSULATION THICKNESS BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 110, VOLUME 5, IN 2015 RSBS.

Inches of Insulation	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	28.9%	7.7%	17.9%	4.3%	9.0%	5.5%	21.8%	4.1%
0.5	1.2%	2.0%	0.2%▼	0.3%	0.0%	0.0%	0.6%	0.9%
1	0.0%	0.0%	0.5%▼	0.6%	0.0%	0.0%	0.2%▼	0.2%
1.5	3.6%	3.4%	1.5%	1.4%	0.0%	0.0%	2.3%	1.7%
2	1.3%▼	2.0%	3.2%	2.0%	5.3%	4.3%	2.6%▼	1.4%
2.5	3.9%	3.4%	1.2%	1.2%	0.0%	0.0%	2.3%	1.7%
3	2.1%	2.5%	4.4%	2.4%	0.0%	0.0%	2.7%	1.5%
3.5	48.7%▼	8.5%	50.1%▲	5.6%	48.3%	9.7%	49.1%	4.8%
4	0.7%▼	1.2%	0.5%▼	0.8%	0.0%	0.0%	0.5%▼	0.6%
4.5	1.2%	2.0%	0.0%	0.0%	0.0%	0.0%	0.6%	0.9%
5.5	8.3%	4.8%	18.9%▼	4.4%	37.4%	9.4%	16.7%▼	3.3%
8	0.0%	0.0%	1.5%	1.3%	0.0%	0.0%	0.5%	0.5%
Observations Type (n)	117	117	238	238	78	78	433	433

Note: This table estimates the distribution of interior or cavity wall insulation thickness by area. The number of observations equals the wall segments with known insulation thickness values defined in the data. More than one segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the distribution of insulation thickness.

Source: On-site fields: ['Interior or Cavity Insulation Thickness (Inches)', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 169. NEW HOMES: WALL INSULATION INTERIOR/CAVITY THICKNESS BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 111, VOLUME 5, IN 2015 RSBS.

Inches of Insulation	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	0.0%	0.0%	1.5%	1.7%	8.6%	9.1%	3.5%	2.8%
3	0.0%	0.0%	0.0%	0.0%	4.5%	7.6%	1.3%▼	2.1%
3.5	30.0%	40.7%	13.2%▼	6.7%	19.1%	13.5%	14.9%	6.1%
4	0.0%	0.0%	0.0%	0.0%	4.5%	7.6%	1.3%	2.1%
5.5	70.0%	40.7%	82.4%▲	7.4%	62.3%	16.7%	76.7%	7.2%
6.5	0.0%	0.0%	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
10.5	0.0%	0.0%	1.5%	2.4%	0.0%	0.0%	1.1%	1.8%
11	0.0%	0.0%	0.0%	0.0%	0.9%	1.6%	0.3%	0.4%
Observations (n)	6	6	78	78	29	29	107	107

Note: This table estimates the distribution of interior or cavity wall insulation thickness by area. The number of observations equals the wall segments with known insulation thickness values defined in the data. More than one segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the distribution of insulation thickness.
[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

Source: On-site fields: ['Interior or Cavity Insulation Thickness (Inches)', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 170. WALL INTERIOR/CAVITY INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 123, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	9.2%▲	5.7%	10.4%	3.7%	8.9%	5.3%	9.6%▲	3.0%
Grade II	42.4%	10.0%	62.7%▲	5.9%	66.6%▲	9.5%	54.6%▲	5.3%
Grade III	35.5%▼	9.8%	21.5%▼	5.0%	17.2%▼	7.8%	26.8%▼	4.9%
Sub Grade III	12.9%	7.0%	5.4%	2.8%	7.3%	5.3%	9.0%	3.3%
Observations (n)	86	86	259	259	97	97	442	442

Note: This table represents interior or cavity wall insulation grade by area. The number of observations equals the number of wall segments with known insulation grade defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of insulation of each grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 171. EXISTING HOMES: WALL INTERIOR/CAVITY INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 124, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	9.2%▲	5.7%	10.0%	3.8%	8.3%	5.4%	9.3%▲	3.0%
Grade II	42.4%	10.0%	63.1%▲	6.0%	67.0%▲	9.6%	54.8%▲	5.4%
Grade III	35.5%▼	9.8%	21.4%▼	5.1%	17.3%▼	7.9%	26.8%▼	4.9%
Sub Grade III	12.9%	7.0%	5.5%	2.8%	7.4%	5.3%	9.1%	3.4%
Observations (n)	86	86	193	193	71	71	350	350

Note: This table represents interior or cavity wall insulation grade by area. The number of observations equals the number of wall segments with known insulation grade defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of insulation of each grade.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 172. NEW HOMES: WALL INTERIOR/CAVITY INSULATION GRADE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 125, VOLUME 5, IN 2015 RSBS.

Insulation Grade	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Grade I	**40.0%**	**45.4%**	49.5%▲	10.7%	69.2%▲	16.6%	55.1%▲	9.1%
Grade II	**60.0%**	**45.4%**	25.5%▼	9.3%	20.9%▼	14.8%	24.2%▼	7.8%
Grade III	**0.0%**	**0.0%**	25.0%	9.2%	10.0%	10.1%	20.7%	7.2%
Observations (n)	6	6	66	66	26	26	92	92

Note: This table represents interior or cavity wall insulation grade by area. The number of observations equals the number of wall segments with known insulation grade defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of insulation of each grade.

[a] *Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.*

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 173. NEW HOMES: WALL INTERIOR/CAVITY INSULATION TYPE AND GRADE (SITE)

COMPARE WITH TABLE 126, VOLUME 5, IN 2015 RSBS.

Insulation Type	Grade I		Grade II		Grade III		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Mineral Wool[a]	2.6%	4.3%	5.9%	8.3%	0.0%	0.0%	2.9%	3.0%
Spray Foam - Combo[a]	4.3%	5.1%	0.0%	0.0%	0.0%	0.0%	2.4%	2.8%
Fiberglass Batts	71.1%	11.5%	90.2%	10.5%	100.0%	0.0%	81.7%	7.1%
Spray Foam	22.0%	10.5%	3.9%	6.8%	0.0%	0.0%	13.1%▲	6.2%
Insulation Type (n)	47	47	24	24	21	21	92	92

Note: This table represents interior or cavity wall insulation type and grade by area. The number of observations equals the number of wall segments with known insulation type and grade defined in the data. More than one wall segment may be defined per home. Each segment includes an indication of the percentage of wall area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation and insulation grade.

[a] The mineral wool and spray foam - combo insulation types were not represented in the corresponding table in the 2015 RSBS.

Source: On-site fields: ['Interior or Cavity Insulation Grade', 'Interior or Cavity Insulation Type', 'Percentage of Surface Type'].

TABLE 174. RIM JOIST INTERIOR INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 127, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	69.9%	7.8%	44.1%	5.6%	40.4%	9.7%	55.9%	4.7%
Fiberglass Batts	24.0%	7.4%	40.9%▼	5.5%	45.7%	9.8%	33.6%	4.4%
Spray Foam	2.5%	2.7%	12.1%	3.7%	5.9%	4.5%	6.6%	2.1%
EPS[a]	2.7%	2.7%	0.0%	0.0%	4.7%	4.1%	2.0%	1.4%
Cellulose	0.7%	1.2%	0.0%	0.0%	0.2%▼	0.3%	0.4%	0.6%
Fiberglass Fill	0.0%	0.0%	1.0%	1.2%	0.0%	0.0%	0.4%	0.4%
Mineral Wool	0.0%	0.0%	0.0%	0.0%	1.6%	2.6%	0.2%	0.4%
Polyisocyanurate	0.0%	0.0%	0.5%	0.8%	0.0%▼	0.1%	0.2%▼	0.3%
XPS	0.1%	0.2%	0.3%	0.4%	0.0%	0.0%	0.2%	0.2%
Spray Foam - Combo[a]	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%	0.3%
Observations (n)	115	115	320	320	98	98	533	533

Note: This table represents the distribution of rim joist interior insulation type by area. The number of observations equals the number of rim joist segments with known insulation values defined in the data. More than one rim joist segment may be defined per home. Each segment includes an indication of the percentage of rim joist area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

[a] The EPS and spray foam - combo insulation types were not represented in the equivalent table in the 2015 RSBS.

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 175. EXISTING HOMES: RIM JOIST INTERIOR INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 128, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
None	69.9%	7.8%	44.5%	5.6%	40.6%	9.7%	56.1%	4.7%
Fiberglass Batts	24.0%	7.4%	40.7%▼	5.6%	45.8%	9.9%	33.4%	4.4%
Spray Foam	2.5%	2.7%	12.0%	3.7%	5.6%	4.6%	6.5%	2.1%
EPS[a]	2.7%	2.7%	0.0%	0.0%	4.7%	4.1%	2.0%	1.4%
Cellulose	0.7%	1.2%	0.0%	0.0%	0.2%▼	0.3%	0.4%	0.6%
Fiberglass Fill	0.0%	0.0%	1.0%	1.2%	0.0%	0.0%	0.4%	0.4%
Mineral Wool[a]	0.0%	0.0%	0.0%	0.0%	1.6%	2.6%	0.2%	0.4%
Polyisocyanurate	0.0%	0.0%	0.5%	0.8%	0.0%	0.0%	0.2%▼	0.3%
XPS	0.1%	0.2%	0.3%	0.4%	0.0%	0.0%	0.2%	0.2%
Observations (n)	115	115	239	239	80	80	434	434

Note: This table represents the distribution of rim joist interior insulation type by area. The number of observations equals the number of rim joist segments with known insulation values defined in the data. More than one rim joist segment may be defined per home. Each segment includes an indication of the percentage of rim joist area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

[a] The EPS and mineral wool insulation types were not represented in the equivalent table in the 2015 RSBS.

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 176. NEW HOMES: RIM JOIST INTERIOR INSULATION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 129, VOLUME 5, IN 2015 RSBS.

Insulation Type	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Fiberglass Batts	**80.0%**	**37.8%**	65.6%	9.5%	31.3%	19.6%	57.7%	8.9%
Spray Foam	**20.0%**	**37.8%**	26.6%	8.8%	49.4%	21.5%	31.8%	8.5%
None	**0.0%**	**0.0%**	4.7%	4.4%	6.9%	10.7%	5.2%	4.1%
EPS[b]	**0.0%**	**0.0%**	0.0%	0.0%	6.3%	10.6%	1.4%	2.4%
Polyisocyanurate	**0.0%**	**0.0%**	0.0%	0.0%	6.3%	10.6%	1.4%	2.4%
Spray Foam - Combo[b]	**0.0%**	**0.0%**	1.6%	2.6%	0.0%	0.0%	1.2%	2.0%
XPS	**0.0%**	**0.0%**	1.6%	2.6%	0.0%	0.0%	1.2%	2.0%
Observations (n)	6	6	81	81	18	18	99	99

Note: This table represents the distribution of rim joist interior insulation type by area. The number of observations equals the number of rim joist segments with known insulation values defined in the data. More than one rim joist segment may be defined per home. Each segment includes an indication of the percentage of rim joist area it accounts for in that home, which was applied to each segment in calculating the percentage of each type of insulation.

[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

[b] The EPS and spray foam - combo insulation types were not represented in the equivalent table in the 2015 RSBS.

Source: On-site fields: ['Interior or Cavity Insulation Type', 'Percentage of Surface Type', 'Climate Zone'].

TABLE 177. WINDOW GLAZING BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 139, VOLUME 5, IN 2015 RSBS.

Window Glazing	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Double	55.1%	4.3%	47.1%	3.3%	43.3%	5.7%	50.7%	2.7%
Double Low-E	33.8%	4.2%	29.8%	3.2%	48.9%	6.0%	34.5%	2.6%
Single with Storm Windows	7.7%	2.1%	15.4%	2.3%	4.4%	1.9%	9.9%	1.4%
Single	3.3%	1.2%	2.8%	0.7%	3.1%	1.9%	3.1%	0.7%
Triple Low-E	0.0%	0.0%	2.8%	1.4%	0.3%	0.4%	1.0%	0.5%
Glass Block	0.1%	0.1%	1.9%	0.5%	0.0%	0.0%	0.7%	0.2%
Triple	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.1%	0.1%
Jalousie[a]	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Window Area in Square Feet (n)	22,667	22,667	65,829	65,829	20,833	20,833	109,329	109,329

Note: This table shows the distribution of window glazing based on window area. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.
[a] The jalousie window type was not represented in the corresponding table in the 2015 RSBS.

Source: On-site fields: ['Window Size', 'Number of Windows or Doors', 'Window Glazing', 'Climate Zone'].

TABLE 178. EXISTING HOMES: WINDOW GLAZING BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 140, VOLUME 5, IN 2015 RSBS.

Window Glazing	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Double	55.1%	4.3%	47.4%	3.4%	43.6%	5.8%	50.9%	2.7%
Double Low-E	33.8%	4.2%	29.2%	3.2%	48.7%	6.1%	34.3%	2.6%
Single with Storm Windows	7.7%	2.1%	15.6%	2.4%	4.4%	2.0%	9.9%	1.4%
Single	3.3%	1.2%	2.8%	0.7%	3.1%	1.9%	3.1%	0.7%
Triple Low-E	0.0%	0.0%	2.8%	1.4%	0.2%	0.3%	1.0%	0.5%
Glass Block	0.1%	0.1%	2.0%	0.5%	0.0%	0.0%	0.7%	0.2%
Triple	0.0%	0.0%	0.2%	0.2%	0.0%	0.0%	0.1%	0.1%
Jalousie[a]	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Window Area in Square Feet (n)	22,667	22,667	45,688	45,688	15,411	15,411	83,767	83,767

Note: This table shows the distribution of window glazing based on window area. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.
[a] The jalousie window type was not represented in the corresponding table in the 2015 RSBS.

Source: On-site fields: ['Window Size', 'Number of Windows or Doors', 'Window Glazing', 'Climate Zone'].

BACK TO REPORT

TABLE 179. NEW HOMES: WINDOW GLAZING BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 141, VOLUME 5, IN 2015 RSBS.

Window Glazing	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Double Low-E	86.2%	8.3%	78.5%	7.0%	76.4%	15.4%	78.0%	6.5%
Double	13.8%	8.3%	17.8%	6.7%	9.8%	9.9%	15.9%	5.6%
Triple Low-E	0.0%	0.0%	3.7%	2.7%	13.7%	12.8%	6.1%	3.8%
Window Area in Square Feet (n)	1,264	1,264	20,141	20,141	5,421	5,421	25,562	25,562

Note: This table shows the distribution of window glazing based on window area. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.
[a] Shaded cells indicate results that cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

Source: On-site fields: ['Window Size', 'Number of Windows or Doors', 'Window Glazing', 'Climate Zone'].

TABLE 180. WINDOW CONDITION BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 142, VOLUME 5, IN 2015 RSBS.

Overall Window Condition	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Good	68.1%	4.0%	75.5%	2.6%	64.3%	5.5%	70.1%	2.4%
Fair	26.3%	3.9%	19.3%	2.4%	31.8%	5.4%	24.7%	2.3%
Poor	5.6%	1.7%	5.2%	1.2%	3.9%	2.1%	5.2%	1.0%
Window Area in Square Feet (n)	22,625	22,625	65,786	65,786	20,833	20,833	109,244	109,244

Note: This table shows window condition based on window area. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.

Source: On-site fields: ['Window Size', 'Number of Windows or Doors', 'Window Glazing', 'Climate Zone'].

TABLE 181. EXISTING HOMES: WINDOW CONDITION BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 143, VOLUME 5, IN 2015 RSBS.

Overall Window Condition	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Good	68.1%	4.0%	75.2%	2.7%	64.0%	5.6%	69.9%	2.4%
Fair	26.3%	3.9%	19.5%	2.5%	32.1%	5.4%	24.8%	2.3%
Poor	5.6%	1.7%	5.3%	1.2%	3.9%	2.2%	5.3%	1.0%
Window Area in Square Feet (n)	22,625	22,625	45,645	45,645	15,411	15,411	83,682	83,682

Note: This table shows window condition based on window area. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.

Source: On-site fields: ['Window Size', 'Number of Windows or Doors', 'Window Glazing', 'Climate Zone'].

TABLE 182. WINDOW FRAME TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 145, VOLUME 5, IN 2015 RSBS.

Window Frame Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Vinyl	56.4%	4.3%	54.2%	3.4%	54.8%	5.9%	55.4%	2.7%
Wood	35.5%	4.2%	39.0%	3.3%	42.1%	5.9%	37.6%	2.6%
Metal	8.0%	2.1%	2.8%	0.8%	1.6%	1.1%	5.4%	1.1%
Fiberglass	0.0%	0.0%	3.5%	2.0%	0.1%	0.1%	1.2%	0.7%
Metal with Thermal Break	0.0%	0.0%	0.4%	0.4%	1.5%	1.3%	0.3%	0.2%
Window Area in Square Feet (n)	22,530	22,530	64,929	64,929	20,833	20,833	108,292	108,292

Note: This table shows the distribution of window frame type based on window area. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.

Source: On-site fields: ['Window Size', 'Number of Windows or Doors', 'Window Glazing', 'Climate Zone'].

TABLE 183. EXISTING HOMES: WINDOW FRAME TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 146, VOLUME 5, IN 2015 RSBS.

Window Frame Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Vinyl	56.4%	4.3%	54.1%	3.4%	54.4%	6.0%	55.4%	2.7%
Wood	35.5%	4.2%	39.0%	3.3%	42.5%	5.9%	37.7%	2.6%
Metal	8.0%	2.1%	2.9%	0.8%	1.6%	1.1%	5.4%	1.1%
Fiberglass	0.0%	0.0%	3.5%	2.0%	0.0%	0.1%	1.2%	0.7%
Metal with Thermal Break	0.0%	0.0%	0.4%	0.4%	1.5%	1.4%	0.4%	0.2%
Window Area in Square Feet (n)	22,530	22,530	44,788	44,788	15,411	15,411	82,729	82,729

Note: This table shows the distribution of window frame type based on window area. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.

Source: On-site fields: ['Window Size', 'Number of Windows or Doors', 'Window Glazing', 'Climate Zone'].

TABLE 184. STORM WINDOWS PRESENCE BY AGE OF HOME (SITE)

COMPARE WITH TABLE 147, VOLUME 5, IN 2015 RSBS.

Home Age	Exterior		Interior		None		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%
2 to 4 Years	0.0%	0.0%	0.0%	0.0%	0.5%	0.1%	0.4%	0.1%
5 to 14 Years	0.2%	0.2%	0.0%	0.0%	8.5%	1.9%	7.5%	1.6%
15 to 24 Years	0.1%	0.1%	0.0%	0.0%	6.7%	1.4%	5.9%	1.2%
25 to 34 Years	0.5%	0.5%	0.0%	0.0%	8.7%	1.4%	7.7%	1.2%
35 to 44 Years	6.0%	2.8%	6.0%	6.7%	5.1%	0.9%	5.3%	0.9%
45 to 54 Years	3.8%	2.0%	23.9%	13.2%	12.8%	1.9%	11.9%	1.7%
55 to 64 Years	11.8%	5.3%	24.6%	14.2%	14.1%	1.9%	13.9%	1.8%
65 to 74 Years	6.6%	3.0%	1.8%	2.2%	7.2%	1.3%	7.1%	1.2%
75 Years or More	71.1%	6.4%	43.7%	16.9%	36.1%	2.9%	40.2%	2.7%
Window Area in Square Feet (n)	10,246	10,246	784	784	98,299	98,299	109,329	109,329

Note: This table shows the distribution of storm windows of each type (including none) by home age. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.

Source: On-site fields: ['Year Building Built', 'Window Size', 'Number of Windows or Doors', 'Storm Windows'].

TABLE 185. EXISTING HOMES: STORM WINDOW PRESENCE BY AGE OF HOME (SITE)

COMPARE WITH TABLE 148, VOLUME 5, IN 2015 RSBS.

Home Age	Exterior		Interior		None		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
5 to 14 Years	0.2%	0.2%	0.0%	0.0%	8.6%	1.9%	7.6%	1.6%
15 to 24 Years	0.1%	0.1%	0.0%	0.0%	6.8%	1.4%	6.0%	1.2%
25 to 34 Years	0.5%	0.5%	0.0%	0.0%	8.7%	1.4%	7.7%	1.3%
35 to 44 Years	6.0%	2.8%	6.0%	6.7%	5.2%	0.9%	5.3%	0.9%
45 to 54 Years	3.8%	2.0%	23.9%	13.2%	12.9%	1.9%	11.9%	1.7%
55 to 64 Years	11.8%	5.3%	24.6%	14.2%	14.2%	1.9%	14.0%	1.8%
65 to 74 Years	6.6%	3.0%	1.8%	2.2%	7.3%	1.3%	7.2%	1.2%
75 Years or More	71.1%	6.4%	43.7%	16.9%	36.3%	2.9%	40.4%	2.7%
Window Area in Square Feet (n)	10,246	10,246	784	784	72,737	72,737	83,767	83,767

Note: This table shows the distribution of storm windows of each type (including none) by home age. Comparisons to the values of the corresponding table in the 2015 RSBS may not be valid because the 2015 RSBS values were calculated by window count.

Source: On-site fields: ['Year Building Built', 'Window Size', 'Number of Windows or Doors', 'Storm Windows'].

TABLE 186. AVERAGE WINDOW SIZE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 150, VOLUME 5, IN 2015 RSBS.

Window Size (sq ft)	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	11.5▼	0.5	10.9▼	0.3	11.7	0.5	11.3▼	0.3
Windows (n)	1,977	1,977	5,541	5,541	1,701	1,701	9,219	9,219

Source: On-site fields: ['Number of Windows or Doors', 'Window Size', 'Climate Zone'].

TABLE 187. AVERAGE NUMBER OF WINDOWS BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 152, VOLUME 5, IN 2015 RSBS.

Number of Windows	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	26.3	2.1	23.5	1.0	22.1	1.8	24.6	1.1
Windows (n)	2,239	2,239	6,391	6,391	1,994	1,994	10,624	10,624

Note: Results cannot be meaningfully compared to 2015 RSBS results because of apparent differences in methodology.

Source: On-site fields: ['Number of Windows or Doors', 'Climate Zone'].

TABLE 188. AVERAGE NUMBER OF WINDOWS BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 153, VOLUME 5, IN 2015 RSBS.

Number of Windows	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Mean	24.7	1.1	22.0	1.5	24.6	1.1
Windows (n)	8,637	8,637	1,987	1,987	10,624	10,624

Note: Results cannot be meaningfully compared to 2015 RSBS results because of apparent differences in methodology.

Source: On-site fields: ['Number of Windows or Doors', 'Construction Type'].

TABLE 189. AVERAGE U-FACTOR OF WINDOWS BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 154, VOLUME 5, IN 2015 RSBS.

U-Factor	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	0.42	0.01	0.40	0.01	0.40	0.01	0.41	0.01
Window Square Feet (n)	22,520	22,520	65,038	65,038	20,833	20,833	108,391	108,391

Note: Documentation of window U-factor was generally not available during site visits. U-factor values were inferred where practical from National Renewable Energy Laboratory database values based on windows frame and glazing. Methodology may differ from that of the 2015 RSBS.

Source: On-site fields: ['Final Window U-Value', 'Number of Windows or Doors', 'Window Size', 'Climate Zone'].

TABLE 190. AVERAGE U-FACTOR OF WINDOWS BY HOME VINTAGE (SITE)
COMPARE WITH TABLE 155, VOLUME 5, IN 2015 RSBS.

U-Factor	Existing Homes		New Homes		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB
Mean	0.41	0.01	0.32	0.01	0.41	0.01
Window Square Feet (n)	82,829	82,829	25,562	25,562	108,391	108,391

Note: Documentation of window U-factor was generally not available during site visits. U-factor values were inferred where practical from National Renewable Energy Laboratory database values based on windows frame and glazing. Methodology may differ from that of the 2015 RSBS.

Source: On-site fields: ['Final Window U-Value', 'Number of Windows or Doors', 'Window Size', 'Construction Type'].

TABLE 191. DOOR MATERIAL BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 156, VOLUME 5, IN 2015 RSBS.

Door Material	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Steel with Glazing	23.3%▲	5.3%	26.7%▲	3.9%	37.7%▲	7.0%	26.9%▲	3.1%
Wood with Glazing	21.4%	5.0%	22.8%	3.9%	20.2%	6.2%	21.7%▼	2.9%
Steel	11.8%	4.2%	12.3%▲	2.7%	11.6%▲	4.0%	12.0%▲	2.3%
Sliding Glass	10.7%	3.9%	10.0%▼	2.8%	12.0%	5.8%	10.7%▼	2.3%
Steel Foam Filled	12.6%	4.0%	6.8%▼	2.1%	2.7%▼	1.7%	8.8%	2.1%
Wood	9.5%	3.6%	7.9%	2.3%	4.3%▼	2.2%	8.1%	1.9%
Fiberglass with Glazing	5.0%	2.4%	5.7%	1.7%	5.3%	2.6%	5.3%	1.4%
Wood Panel	3.8%	3.0%	3.3%	1.3%	0.5%▼	0.7%	3.1%	1.5%
Vinyl with Glazing	1.1%▼	1.4%	2.4%	1.3%	3.0%	2.3%	1.9%▼	0.9%
Fiberglass	0.8%	0.9%	1.6%	0.8%	2.2%	1.9%	1.3%	0.6%
Vinyl	0.0%	0.0%	0.3%	0.5%	0.4%▼	0.7%	0.2%▼	0.2%
French Door[a]	0.0%	0.0%	0.2%	0.3%	0.0%	0.0%	0.1%	0.1%
Doors (n)	262	262	850	850	293	293	1,405	1,405

Note: This table shows the distribution of door material based on door count.
[a] The French door type was not represented in the corresponding table of the 2015 RSBS.

Source: On-site fields: ['Number of Windows or Doors', 'Door Material', 'Climate Zone'].

TABLE 192. EXISTING HOMES: DOOR MATERIAL BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 157, VOLUME 5, IN 2015 RSBS.

Door Material	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Steel with Glazing	23.3%▲	5.3%	27.0%▲	4.0%	37.9%▲	7.0%	27.0%▲	3.1%
Wood with Glazing	21.4%	5.0%	22.9%	3.9%	20.3%	6.2%	21.7%▼	2.9%
Steel	11.8%	4.2%	12.4%▲	2.7%	11.6%▲	4.1%	12.0%▲	2.3%
Sliding Glass	10.7%	3.9%	10.0%▼	2.9%	12.1%	5.9%	10.7%▼	2.3%
Steel Foam Filled	12.6%	4.0%	6.5%▼	2.1%	2.6%▼	1.7%	8.8%	2.1%
Wood	9.5%	3.6%	7.9%	2.3%	4.3%▼	2.2%	8.1%	1.9%
Fiberglass with Glazing	5.0%	2.4%	5.6%	1.7%	5.2%	2.6%	5.2%	1.4%
Wood Panel	3.8%	3.0%	3.3%	1.3%	0.4%▼	0.7%	3.1%	1.5%
Vinyl with Glazing	1.1%▼	1.4%	2.4%	1.3%	3.0%	2.3%	1.9%▼	0.9%
Fiberglass	0.8%	0.9%	1.6%	0.8%	2.2%	1.9%	1.3%	0.6%
Vinyl	0.0%	0.0%	0.3%	0.5%	0.4%▼	0.7%	0.2%▼	0.2%
French Door[a]	0.0%	0.0%	0.2%	0.3%	0.0%	0.0%	0.1%	0.1%
Doors (n)	262	262	630	630	232	232	1,124	1,124

Note: This table shows the distribution of door material based on door count.
[a] The French door type was not represented in the corresponding table of the 2015 RSBS.

Source: On-site fields: ['Number of Windows or Doors', 'Door Material', 'Climate Zone'].

TABLE 193. NEW HOMES: DOOR MATERIAL BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 158, VOLUME 5, IN 2015 RSBS.

Door Material	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Steel Foam Filled	**30.0%**	**20.4%**	31.4%	7.1%	23.0%	12.2%	29.3%	6.1%
Sliding Glass	**36.7%**	**23.7%**	12.3%▼	5.1%	6.6%▼	6.5%	10.8%▼	4.2%
Wood with Glazing	**30.0%**	**21.1%**	13.2%	5.7%	13.1%	9.0%	13.2%	4.8%
Fiberglass with Glazing	**0.0%**	**0.0%**	16.4%	6.2%	27.9%	13.9%	19.2%	5.9%
Fiberglass	**0.0%**	**0.0%**	6.4%	3.1%	8.2%	6.1%	6.8%	2.8%
Steel with Glazing	**3.3%**	**5.7%**	2.7%▼	2.1%	9.8%	8.3%	4.5%▼	2.6%
Wood	**0.0%**	**0.0%**	6.8%	4.4%	3.3%	3.9%	5.9%	3.4%
Steel	**0.0%**	**0.0%**	5.0%	3.0%	1.6%▼	2.7%	4.2%	2.4%
Vinyl with Glazing	**0.0%**	**0.0%**	4.1%	2.9%	3.3%	5.4%	3.9%	2.5%
Wood Panel	**0.0%**	**0.0%**	1.4%	1.3%	3.3%	5.4%	1.8%	1.7%
Vinyl	**0.0%**	**0.0%**	0.5%▼	0.8%	0.0%	0.0%	0.3%▼	0.6%
Doors (n)	30	30	220	220	61	61	281	281

Note: This table shows the distribution of door material based on door count.
[a] These results cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

Source: On-site fields: ['Number of Windows or Doors', 'Door Material', 'Climate Zone'].

TABLE 194. INSTALLATION QUALITY OF DOOR WEATHERSTRIPPING (SITE)

COMPARE WITH TABLE 48, VOLUME 1, IN 2015 RSBS.

Installation Quality	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Good	45.8%	6.2%	54.7%	4.4%	47.3%	7.3%	49.3%	3.5%
Fair	34.7%	6.1%	25.1%	4.0%	38.6%▲	6.9%	31.9%▲	3.4%
Poor	14.1%	4.1%	10.2%	2.6%	10.7%	4.4%	12.1%	2.3%
None	5.3%▼	2.6%	9.9%	2.6%	3.4%	2.2%	6.7%	1.6%
Doors (n)	262	262	850	850	293	293	1,405	1,405

Note: This table shows the distribution of door weatherstripping quality based on door count.

Source: On-site fields: ['Number of Windows or Doors', 'Door Weather Stripping', 'Climate Zone'].

TABLE 195. NEW HOMES: INSTALLATION QUALITY OF DOOR WEATHERSTRIPPING (SITE)

COMPARE WITH TABLE 49, VOLUME 1, IN 2015 RSBS.

Installation Quality	Climate Zone 4[a]		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Good	**100.0%**	**0.0%**	98.2%	1.5%	91.8%	8.7%	96.6%	2.5%
None	**0.0%**	**0.0%**	0.9%	1.1%	0.0%	0.0%	0.7%	0.8%
Fair	**0.0%**	**0.0%**	0.5%▼	0.8%	6.6%	8.3%	2.0%	2.2%
Poor	**0.0%**	**0.0%**	0.5%	0.8%	1.6%	2.7%	0.8%	0.9%
Doors (n)	30	30	220	220	61	61	281	281

Note: This table shows the distribution of door weatherstripping quality based on door count.
[a] These results cannot be considered representative because of the small sample size for new homes site visits in Climate Zone 4.

Source: On-site fields: ['Number of Windows or Doors', 'Door Weather Stripping', 'Climate Zone'].

TABLE 196. AVERAGE NUMBER OF LIGHT BULBS USED TWO OR MORE HOURS PER DAY INSIDE HOME BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 50, VOLUME 1, IN 2015 RSBS.

Lamp Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
CFLs and LEDs	11.3▲	0.8	8.3▲	0.4	9.0▲	0.7	9.8▲	0.4
Incandescent	2.4▼	0.4	2.9	0.3	2.6	0.4	2.6▼	0.2
Other	0.9▼	0.2	0.9▼	0.2	1.0	0.2	0.9▼	0.1
Respondents (n)	473	473	1,173	1,173	467	467	2,113	2,113

Source: Survey fields: ['CFL Bulbs Inside Home', 'LED Bulbs Inside Home', 'Incandescent Bulbs Inside', 'Other Bulbs Inside Home', 'Climate Zone'].

BACK TO REPORT

TABLE 197. AVERAGE NUMBER OF INTERIOR LIGHT BULBS USED TWO OR MORE HOURS PER DAY BY BULB TYPE AND CLIMATE ZONE (SURVEY)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Lamp Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
LEDs[a]	7.9	0.8	5.2	0.4	5.8	0.6	6.6	0.4
CFLs[a]	3.4	0.4	3.1	0.3	3.2	0.4	3.3	0.2
Incandescent	2.4▼	0.4	2.9	0.3	2.6	0.4	2.6▼	0.2
Other Bulbs	0.9▼	0.2	0.9▼	0.2	1.0	0.2	0.9▼	0.1
Respondents (n)	473	473	1,173	1,173	467	467	2,113	2,113

[a] *Results for CFL and LED bulbs cannot be directly compared to results in the 2015 RSBS.*

Source: Survey fields: ['CFL Bulbs Inside Home', 'LED Bulbs Inside Home', 'Incandescent Bulbs Inside', 'Other Bulbs Inside Home', 'Climate Zone'].

TABLE 198. DISTRIBUTION OF BULB TYPE BY CLIMATE ZONE, WITH CFL AND LED COMBINED (SITE)

COMPARE WITH TABLE 51, VOLUME 1, IN 2015 RSBS.

Lamp Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
CFL/LED[a]	57.1%▲	2.7%	45.3%▲	1.8%	53.0%▲	3.2%	52.4%▲	1.6%
Inefficient[b]	32.7%▼	2.5%	44.5%▼	1.9%	36.3%▼	3.0%	37.3%▼	1.5%
Linear Fluorescent[c]	8.3%	1.6%	8.4%	1.4%	9.3%	2.1%	8.5%	1.0%
Other[c]	1.9%	0.9%	1.9%	1.0%	1.4%	1.8%	1.8%	0.6%
Lamps (n)	6,885	6,885	19,760	19,760	6,076	6,076	32,721	32,721

[a] *CFL and LED bulb types are combined to allow comparisons with the 2015 RSBS.*
[b] *Inefficient bulbs include conventional incandescent and halogen bulbs.*
[c] *Linear fluorescent and other bulb types shown here cannot be directly compared to bulb types defined in the corresponding 2015 RSBS table.*

Source: On-site fields: ['Number of Linear Fluorescent Bulbs', 'Number of LED Bulbs', 'Number of CFL Bulbs', 'Number of Inefficient Bulbs', 'Number of Other Light Bulbs', 'Climate Zone'].

BACK TO REPORT

TABLE 199. DISTRIBUTION OF BULB TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 51, VOLUME 1, IN 2015 RSBS.

Lamp Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Inefficient[a]	32.7%▼	2.5%	44.5%▼	1.9%	36.3%▼	3.0%	37.3%▼	1.5%
LED	37.8%	2.8%	27.6%	1.6%	36.1%	3.0%	34.0%	1.6%
CFL	19.3%	2.1%	17.6%	1.2%	16.9%	2.1%	18.4%	1.2%
Linear Fluorescent	8.3%	1.6%	8.4%	1.4%	9.3%	2.1%	8.5%	1.0%
Other	1.9%	0.9%	1.9%	1.0%	1.4%	1.8%	1.8%	0.6%
Lamps (n)	6,885	6,885	19,760	19,760	6,076	6,076	32,721	32,721

[a] *Inefficient bulbs include conventional incandescent and halogen bulbs. In this table, only results for the inefficient bulb type can be directly compared to results in the corresponding 2015 RSBS table.*

Source: On-site fields: ['Number of Linear Fluorescent Bulbs', 'Number of LED Bulbs', 'Number of CFL Bulbs', 'Number of Inefficient Bulbs', 'Number of Other Light Bulbs', 'Climate Zone'].

BACK TO REPORT

TABLE 200. DISTRIBUTION OF BULB TYPE BY HOME VINTAGE, WITH CFL AND LED COMBINED (SITE)

COMPARE WITH TABLE 52, VOLUME 1, IN 2015 RSBS.

Lamp Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
CFL/LED[a]	52.3%▲	1.6%	78.8%▲	2.2%	52.4%▲	1.6%
Inefficient[b]	37.4%▼	1.5%	16.0%▼	1.9%	37.3%▼	1.5%
Linear Fluorescent[c]	8.5%	1.0%	2.0%	0.8%	8.5%	1.0%
Other[c]	1.8%	0.7%	3.2%	0.8%	1.8%	0.6%
Lamps (n)	26,042	26,042	6,679	6,679	32,721	32,721

[a] *CFL and LED bulb types are combined to allow comparisons with the 2015 RSBS.*
[b] *Inefficient bulbs include conventional incandescent and halogen bulbs.*
[c] *Linear fluorescent and other bulb types shown here cannot be directly compared to bulb types in the corresponding 2015 RSBS table.*

Source: On-site fields: ['Number of Linear Fluorescent Bulbs', 'Number of LED Bulbs', 'Number of CFL Bulbs', 'Number of Inefficient Bulbs', 'Number of Other Light Bulbs', 'Construction Type'].

TABLE 201. DISTRIBUTION OF BULB TYPE BY HOME VINTAGE (SITE)

COMPARE WITH TABLE 52, VOLUME 1, IN 2015 RSBS.

Lamp Type	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Inefficient[a]	37.4%▼	1.5%	16.0%▼	1.9%	37.3%▼	1.5%
LED	33.9%	1.6%	62.3%	2.6%	34.0%	1.6%
CFL	18.4%	1.2%	16.5%	1.9%	18.4%	1.2%
Linear Fluorescent	8.5%	1.0%	2.0%	0.8%	8.5%	1.0%
Other	1.8%	0.7%	3.2%	0.8%	1.8%	0.6%
Lamps (n)	26,042	26,042	6,679	6,679	32,721	32,721

[a] *Inefficient bulbs include conventional incandescent and halogen bulbs. In this table, only results for the Inefficient bulb type can be directly compared to results in the corresponding 2015 RSBS table.*

Source: On-site fields: ['Number of Linear Fluorescent Bulbs', 'Number of LED Bulbs', 'Number of CFL Bulbs', 'Number of Inefficient Bulbs', 'Number of Other Light Bulbs', 'Construction Type'].

BACK TO REPORT

TABLE 202. EXISTING HOMES: BULB TYPE BY ROOM (SITE)

COMPARE WITH TABLE 53, VOLUME 1, IN 2015 RSBS.

Room Type	CFL		Inefficient[a]		LED		Linear Fluorescent		Other	
	%	EB	%	EB	%	EB	%	EB	%	EB
Attic[b]	23%	13%	60%	19%	13%	15%	5%	8%	0%	0%
Bathroom	18%	3%	46%	4%	34%	4%	1%	0%	0%	0%
Bedroom	24%	3%	39%	3%	32%	3%	3%	1%	2%	2%
Bulbs in Storage[b]	24%	8%	39%	10%	32%	9%	5%	6%	0%	0%
Closet	20%	7%	36%	8%	21%	6%	23%	11%	0%	0%
Den/Office	19%	5%	39%	7%	32%	7%	9%	4%	0%	1%
Dining Room	9%	3%	47%	7%	40%	8%	1%	1%	3%	2%
Entryway	16%	5%	53%	9%	28%	8%	1%	1%	2%	2%
Exterior	15%	3%	45%	6%	31%	6%	1%	1%	9%	6%
Garage	16%	5%	28%	6%	19%	5%	36%	9%	1%	1%
Hallway	24%	6%	36%	6%	38%	6%	1%	0%	1%	1%
Kitchen	12%	3%	32%	5%	44%	5%	8%	2%	3%	3%
Laundry	20%	7%	24%	10%	30%	10%	26%	9%	0%	0%
Living Room	21%	4%	38%	5%	39%	5%	1%	1%	1%	0%
Other[b]	37%	32%	23%	17%	32%	20%	8%	8%	0%	0%
Utility	16%	3%	24%	4%	26%	5%	34%	5%	0%	0%
Overall Statewide	18%	1%	37%	2%	34%	2%	9%	1%	2%	1%

[a] Inefficient bulbs include conventional incandescent and halogen bulbs. In this table, only results for the inefficient bulb type can be directly compared to results in the corresponding 2015 RSBS table.
[b] Bulb types for attic, bulbs in storage, and other room types cannot be directly compared to 2015 RSBS results.

Source: On-site fields: ['Location of Lighting Unit', 'Number of Linear Fluorescent Bulbs', 'Number of LED Bulbs', 'Number of CFL Bulbs', 'Number of Inefficient Bulbs', 'Number of Other Light Bulbs'].

BACK TO REPORT

TABLE 203. NEW HOMES: BULB TYPE BY ROOM (SITE)

COMPARE WITH TABLE 54, VOLUME 1, IN 2015 RSBS.

Room Type	CFL		Inefficient[a]		LED		Linear Fluorescent		Other	
	%	EB	%	EB	%	EB	%	EB	%	EB
Attic[b]	46.8%	63.5%	0.0%	0.0%	53.2%	63.5%	0.0%	0.0%	0.0%	0.0%
Bathroom	16.2%	5.3%	17.4%	5.7%	65.6%	7.2%	0.0%	0.0%	0.8%	0.6%
Bedroom	22.2%	5.2%	17.2%	4.7%	57.3%	6.4%	0.1%	0.2%	3.2%	1.4%
Bulbs in Storage[b]	0.0%	0.0%	37.2%	0.0%	62.8%	0.0%	0.0%	0.0%	0.0%	0.0%
Closet	29.2%	12.7%	3.0%	2.6%	55.1%	12.4%	12.8%	6.7%	0.0%	0.0%
Den/Office	20.0%	8.7%	11.1%	6.2%	63.8%	11.3%	0.0%	0.0%	5.1%	3.3%
Dining Room	18.7%	8.7%	19.8%	9.4%	59.3%	11.3%	0.0%	0.0%	2.3%	1.7%
Entryway	15.8%	8.5%	20.5%	10.0%	57.4%	12.2%	0.4%	0.6%	5.9%	7.5%
Exterior	8.9%	4.5%	20.2%	8.0%	63.9%	10.3%	0.0%	0.0%	7.1%	6.8%
Garage	24.1%	9.8%	11.0%	5.3%	54.1%	11.2%	9.5%	7.1%	1.3%	1.3%
Hallway	20.7%	7.5%	10.9%	5.7%	66.5%	9.0%	0.4%	0.5%	1.5%	1.8%
Kitchen	10.1%	4.2%	15.9%	5.6%	68.1%	6.9%	1.0%	0.9%	5.0%	2.3%
Laundry	24.5%	10.2%	9.6%	6.3%	63.4%	11.1%	1.5%	1.8%	0.9%	1.5%
Living Room	11.4%	4.7%	16.5%	6.3%	66.5%	7.9%	1.3%	2.1%	4.3%	2.0%
Other[b]	8.5%	6.7%	3.5%	4.7%	59.7%	21.4%	15.8%	22.6%	12.5%	13.3%
Utility	16.5%	1.9%	16.0%	1.9%	62.3%	2.6%	2.0%	0.8%	3.2%	0.8%
Overall Statewide	17.4%	7.0%	19.3%	6.9%	57.4%	9.7%	4.9%	3.0%	1.0%	1.3%

[a] *Inefficient bulbs include conventional incandescent and halogen bulbs. In this table, only results for the Inefficient bulb type can be directly compared to results in the corresponding 2015 RSBS table.*
[b] *Bulbs types for attic, bulbs in storage, and other room types cannot be directly compared to 2015 RSBS results.*

Source: On-site fields: ['Location of Lighting Unit', 'Number of Linear Fluorescent Bulbs', 'Number of LED Bulbs', 'Number of CFL Bulbs', 'Number of Inefficient Bulbs', 'Number of Other Light Bulbs'].

BACK TO REPORT

TABLE 204. COOKING AND CLOTHES DRYING FUEL USE BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 56, VOLUME 1, IN 2015 RSBS.

Appliance Type		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Clothes Dryer	Electricity	41.2%▼	3.7%	59.4%▼	2.7%	78.4%	3.4%	53.9%▼	2.1%
	Natural Gas	57.9%▲	3.7%	37.2%▲	2.7%	14.0%	2.9%	43.2%▲	2.2%
	Propane	0.7%▼	0.6%	3.3%	1.0%	7.7%	2.2%	2.8%▼	0.6%
	Other	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
	Respondents (n)	509	509	1,283	1,283	513	513	2,305	2,305
Oven Fuel	Natural Gas	64.9%	3.7%	43.1%	2.8%	26.0%	3.7%	50.7%	2.2%
	Electricity	27.6%	3.4%	47.0%	2.8%	50.6%	4.3%	38.4%	2.1%
	Electricity and Natural Gas[a]	5.5%	1.7%	3.6%	1.1%	1.6%	1.1%	4.2%	0.9%
	Propane	1.3%▼	0.9%	5.5%▼	1.3%	19.2%▼	3.3%	5.7%▼	0.9%
	Electricity and Propane[a]	0.0%	0.0%	0.7%	0.5%	1.9%	1.2%	0.6%	0.3%
	Oil	0.7%	0.6%	0.0%	0.0%	0.3%	0.4%	0.4%	0.3%
	Natural Gas and Coal[a]	0.0%	0.0%	0.0%	0.0%	0.3%	0.4%	0.0%	0.1%
	Wood	0.0%	0.0%	0.0%	0.0%	0.3%	0.4%	0.0%	0.1%
	Respondents (n)	489	489	1,213	1,213	482	482	2,184	2,184

[a] *Combined fuel types were not represented in the corresponding 2015 RSBS table.*

Source: Survey fields: ['Fuel for Ovens-Other', 'Fuel for Oven Unit-Other', 'Fuel for Ovens-Electric', 'Fuel for Ovens-Natural Gas', 'Fuel for Ovens-Propane', 'Fuel for Oven Unit-Electricity', 'Fuel for Oven Unit-Natural Gas', 'Fuel for Oven Unit-Propane', 'Climate Zone'].

BACK TO REPORT

TABLE 205. COOKING AND CLOTHES DRYING FUEL USE BY HOME VINTAGE (SURVEY)
COMPARE WITH TABLE 56, VOLUME 1, IN 2015 RSBS.

Appliance Type		Existing Homes		New Homes		Overall Statewide	
		%	EB	%	EB	%	EB
Clothes Dryer	Electricity	53.9%	2.2%	50.5%	5.0%	53.9%▼	2.1%
	Natural Gas	43.2%	2.2%	42.9%	5.2%	43.2%▲	2.2%
	Propane	2.7%	0.6%	6.6%	2.4%	2.8%▼	0.6%
	Other (specify)	0.1%	0.2%	0.0%	0.0%	0.1%	0.2%
	Respondents (n)	1,739	1,739	566	566	2,305	2,305
Oven Fuel	Natural Gas	50.7%	2.2%	47.4%	5.2%	50.7%	2.2%
	Electricity	38.5%	2.1%	29.4%	4.3%	38.4%	2.1%
	Electricity and Natural Gas[a]	4.2%	0.9%	6.0%	3.1%	4.2%	0.9%
	Propane	5.6%	0.9%	16.1%	2.9%	5.7%▼	0.9%
	Electricity and Propane[a]	0.6%	0.3%	1.1%	0.7%	0.6%	0.3%
	Oil	0.4%	0.3%	0.0%	0.0%	0.4%	0.3%
	Wood	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
	Natural Gas and Coal[a]	0.0%	0.1%	0.0%	0.0%	0.0%	0.1%
	Respondents (n)	1,652	1,652	532	532	2,184	2,184

Note: Only statewide results can be compared with the results from the corresponding 2015 RSBS table.
[a] Combined fuel types were not represented in the corresponding 2015 RSBS table.

Source: Survey fields: ['Clothes Dryer Fuel Type', 'Fuel for Ovens-Other', 'Fuel for Oven Unit-Other', 'Fuel for Ovens-Electric', 'Fuel for Ovens-Natural Gas', 'Fuel for Ovens-Propane', 'Fuel for Oven Unit-Electricity', 'Fuel for Oven Unit-Natural Gas', 'Fuel for Oven Unit-Propane', 'Construction Type'].

TABLE 206. CLOTHES WASHER ENERGY STAR BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 67, VOLUME 5, IN 2015 RSBS.

ENERGY STAR	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	67.6%▲	9.3%	58.2%▲	6.5%	57.5%	11.1%	62.8%▲	5.4%
No	32.4%	9.3%	41.8%	6.5%	42.5%	11.1%	37.2%	5.4%
Clothes Washers (n)	71	71	212	212	73	73	356	356

Note: This table represents the percentage of clothes washers labeled as ENERGY STAR or that project staff could identify through look-ups as ENERGY STAR certified. Look-ups of older appliances often do not indicate whether they were ENERGY STAR certified when new.

Source: On-site fields: ['Type/Style of Appliance', 'Appliance Energy Star Certified?', 'Number of Appliance Units', 'Climate Zone'].

TABLE 207. CLOTHES WASHER TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 183, VOLUME 5, IN 2015 RSBS.

Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Top Loading	57.0%	8.9%	65.2%	5.4%	59.9%	9.7%	60.5%	4.9%
Front Loading	36.0%	8.6%	32.8%	5.3%	35.8%	9.4%	34.8%	4.7%
Stacked Washer/Dryer	7.0%	4.6%	1.9%	1.6%	4.2%	4.0%	4.7%	2.3%
Combo Washer and Dryer	0.0%	0.0%	0.0%▼	0.0%	0.0%	0.0%	0.0%▼	0.0%
Clothes Washers (n)	86	86	279	279	92	92	457	457

On-Site fields: ['Type/Style of Appliance', 'Number of Appliance Units', 'Climate Zone']

TABLE 208. AGE OF PRIMARY CLOTHES WASHER BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 68, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	14.0%▼	2.6%	15.3%	2.0%	17.1%	3.1%	15.0%	1.5%
2 to 4 Years	20.1%▼	3.0%	22.8%	2.3%	21.2%	3.4%	21.3%▼	1.7%
5 to 9 Years	37.2%	3.6%	34.1%	2.6%	33.1%	3.9%	35.4%	2.1%
10 to 14 Years	20.0%▲	3.0%	15.8%	2.0%	19.5%	3.3%	18.4%▲	1.7%
15 to 19 Years	3.7%	1.4%	6.6%	1.4%	4.4%	1.7%	4.9%	0.9%
20 or More Years	5.0%	1.6%	5.4%	1.3%	4.7%	1.8%	5.1%	0.9%
Respondents (n)	519	519	1,287	1,287	507	507	2,313	2,313

Source: Survey fields: ['Age of Clothes Washer', 'Climate Zone'].

TABLE 209. CLOTHES WASHER AGE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 185, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	10.7%▼	5.6%	12.3%	3.7%	11.6%▼	6.3%	11.4%▼	3.1%
2 to 4 Years	14.3%	6.4%	19.0%	4.4%	18.7%	7.7%	16.7%	3.6%
5 to 9 Years	32.1%	8.5%	22.3%▼	4.8%	38.4%	9.6%	29.5%	4.6%
10 to 14 Years	22.6%	7.6%	29.5%	5.2%	14.2%	6.9%	23.9%	4.2%
15 to 19 Years	13.1%	6.1%	12.1%	3.7%	12.7%	6.6%	12.7%	3.3%
20 or More Years	7.1%	4.7%	4.8%	2.5%	4.3%	4.0%	5.8%	2.5%
Clothes Washers (n)	84	84	273	273	92	92	449	449

On-Site fields: ['Appliance Manufacture Year', 'Number of Appliance Units', 'Climate Zone']

BACK TO REPORT

TABLE 210. WATER TEMPERATURE FOR WASH CYCLE OF CLOTHES WASHER BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 69, VOLUME 5, IN 2015 RSBS.

Water Temperature	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Cold	37.8%	3.7%	44.9%	2.8%	49.1%	4.2%	42.2%	2.1%
Warm	56.3%	3.8%	50.2%	2.8%	48.0%	4.2%	52.7%	2.2%
Hot	5.8%	1.8%	4.9%	1.2%	2.9%	1.4%	5.0%	1.0%
Respondents (n)	497	497	1,258	1,258	491	491	2,246	2,246

Source: Survey fields: ['Wash Cycle Water Temperature', 'Climate Zone'].

TABLE 211. WATER TEMPERATURE FOR RINSE CYCLE OF CLOTHES WASHER BY CLIMATE ZONE

COMPARE WITH TABLE 70, VOLUME 5, IN 2015 RSBS.

Water Temperature	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Cold	75.3%	3.4%	79.5%	2.3%	83.5%	3.2%	78.2%	1.9%
Warm	23.6%	3.3%	19.2%	2.2%	15.4%	3.1%	20.6%	1.8%
Hot	1.1%	0.8%	1.3%	0.6%	1.1%	0.9%	1.2%	0.5%
Respondents (n)	469	469	1,217	1,217	478	478	2,164	2,164

Source: Survey fields: ['Rinse Cycle Water Temperature', 'Climate Zone', 'Construction Type'].

TABLE 212. AVERAGE NUMBER OF LOADS/CYCLES PER WEEK BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 186, VOLUME 5, IN 2015 RSBS.

Appliance		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
Clothes Washer	Loads per Week	4.6▼	0.2	4.9▼	0.2	4.7▼	0.2	4.7▼	0.1
	Respondents (n)	526	526	1,280	1,280	517	517	2,323	2,323
Dishwasher	Loads per Week	3.2▼	0.2	3.3▼	0.1	3.2	0.2	3.2▼	0.1
	Respondents (n)	444	444	1,093	1,093	406	406	1,943	1,943

Note: This table includes weekly loads for part-year homes when occupied.

Source: Survey fields: ['Clothes Washer Loads per Week ', 'Clothes Washer Occupied Loads', 'Dishwasher Loads/Week 1', 'Dishwasher Loads/Week 2', 'Climate Zone'].

TABLE 213. PRIMARY CLOTHES DRYER FUEL BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 73, VOLUME 5, IN 2015 RSBS.

Fuel	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Electricity	41.2%▼	3.7%	59.4%▼	2.7%	78.4%	3.4%	53.9%▼	2.1%
Natural Gas	57.9%▲	3.7%	37.2%▲	2.7%	14.0%	2.9%	43.2%▲	2.2%
Propane	0.7%▼	0.6%	3.3%	1.0%	7.7%	2.2%	2.8%▼	0.6%
Other	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%
Respondents (n)	509	509	1,283	1,283	513	513	2,305	2,305

Source: Survey fields: ['Clothes Dryer Fuel Type', 'Climate Zone'].

TABLE 214. CLOTHES DRYER TYPE BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 188, VOLUME 5, IN 2015 RSBS.

Dryer Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Residential	91.7%	5.0%	98.0%▲	1.6%	95.7%	4.1%	94.7%	2.5%
Stacked Washer/Dryer	7.1%	4.7%	1.9%	1.6%	4.3%	4.1%	4.8%	2.4%
Combo Washer and Dryer	1.2%	2.0%	0.0%▼	0.0%	0.0%	0.0%	0.6%	0.9%
Ventless	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%▼	0.0%
Clothes Dryers (n)	84	84	277	277	90	90	451	451

On-Site fields: ['Type/Style of Appliance', 'Number of Appliance Units', 'Climate Zone']

TABLE 215. AGE OF CLOTHES DRYER BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 74, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	12.1%▼	2.5%	11.3%	1.8%	10.0%	2.5%	11.5%▼	1.4%
2 to 4 Years	16.7%▼	2.8%	17.8%▼	2.1%	19.4%	3.3%	17.5%▼	1.6%
5 to 9 Years	34.6%	3.6%	36.3%	2.7%	34.3%	4.0%	35.2%	2.1%
10 to 14 Years	23.7%▲	3.3%	17.7%	2.1%	22.7%▲	3.5%	21.3%▲	1.8%
15 to 19 Years	6.9%	1.9%	8.3%	1.6%	4.5%▼	1.7%	7.1%	1.1%
20 or More Years	6.0%	1.8%	8.5%▲	1.6%	9.2%	2.4%	7.4%▲	1.1%
Respondents (n)	497	497	1,255	1,255	498	498	2,250	2,250

Source: Survey fields: ['Age of Clothes Dryer', 'Climate Zone'].

TABLE 216. CLOTHES DRYER AGE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 189, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	4.8%▼	3.9%	8.0%	3.1%	10.3%	6.0%	6.9%▼	2.4%
2 to 4 Years	9.6%	5.4%	12.9%	3.8%	16.1%	7.3%	11.9%	3.1%
5 to 9 Years	30.1%	8.4%	31.5%	5.4%	40.4%	9.8%	32.2%	4.7%
10 to 14 Years	28.9%	8.3%	26.0%	5.1%	15.8%	7.3%	25.8%	4.5%
15 to 19 Years	14.5%	6.4%	11.3%	3.7%	12.9%	6.7%	13.0%	3.5%
20 or More Years	12.0%	6.0%	10.3%	3.5%	4.4%	4.1%	10.2%	3.2%
Clothes Dryers (n)	83	83	271	271	90	90	444	444

Source: On-site fields: ['Appliance Manufacture Year', 'Number of Appliance Units', 'Climate Zone'].

BACK TO REPORT

TABLE 217. AVERAGE LOADS OF CLOTHES DRIED PER WEEK BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 72, VOLUME 5, IN 2015 RSBS.

Loads	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	5.1	0.7	4.5▼	0.3	5.5	0.9	4.9	0.4
Clothes Dryers (n)	84	84	276	276	90	90	450	450

Source: On-site fields: ['Number of Appliance Units', 'Loads Per Week', 'Climate Zone'].

TABLE 218. REFRIGERATOR ENERGY STAR BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 76, VOLUME 5, IN 2015 RSBS.

ENERGY STAR	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	35.5%▲	8.3%	44.5%▲	6.0%	45.6%▲	10.2%	40.0%▲	5.0%
No	64.5%▲	8.3%	55.5%	6.0%	54.4%	10.2%	60.0%▲	5.0%
Refrigerators (n)	93	93	253	253	89	89	435	435

Note: This table represents the percentage of refrigerators labeled as ENERGY STAR or that project staff could identify through look-ups as ENERGY STAR certified. Look-ups of older appliances often do not indicate whether they were ENERGY STAR certified when new.

Source: On-site fields: ['Type/Style of Appliance', 'Appliance Energy Star Certified?', 'Number of Appliance Units', 'Climate Zone'].

TABLE 219. AGE OF PRIMARY REFRIGERATOR BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 75, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	12.2%	2.4%	17.8%▲	2.1%	15.3%	3.0%	14.7%	1.5%
2 to 4 Years	18.6%▼	2.8%	19.1%▼	2.2%	18.7%	3.2%	18.8%▼	1.7%
5 to 9 Years	34.2%	3.5%	28.6%▼	2.5%	30.1%	3.8%	31.5%	2.0%
10 to 14 Years	20.5%	3.0%	19.6%	2.2%	21.5%	3.4%	20.3%	1.7%
15 to 19 Years	7.0%	1.9%	8.3%	1.5%	8.5%	2.3%	7.7%▲	1.1%
20 or More Years	7.6%▲	1.9%	6.6%▲	1.4%	5.9%	2.0%	7.0%▲	1.1%
Respondents (n)	538	538	1,293	1,293	509	509	2,340	2,340

Source: Survey fields: ['Age of Fridge', 'Climate Zone'].

TABLE 220. AVERAGE REFRIGERATOR YEAR OF MANUFACTURER PER HOUSEHOLD BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 57, VOLUME 1, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 years	5.9%▼	4.2%	14.7%	4.0%	8.7%	5.5%	9.6%	2.7%
2 to 4 years	9.4%	5.3%	13.1%	3.8%	9.0%	5.5%	10.7%	3.0%
5 to 9 years	25.9%	7.9%	28.2%	5.1%	34.1%	9.4%	28.0%	4.4%
10 to 14 years	32.9%▲	8.5%	19.4%	4.5%	22.7%	8.3%	26.3%	4.6%
15 to 19 years	15.3%	6.5%	14.0%	4.0%	11.3%	6.3%	14.2%	3.5%
20 or more years	10.6%	5.6%	10.6%	3.5%	14.2%	6.9%	11.2%	3.1%
Mean Year of Manufacture	2007▲	1.2	2009▲	0.8	2008▲	1.3	2008▲	0.7
Respondents (n)	85	85	271	271	92	92	448	448

Source: On-site fields: ['Appliance Manufacture Year', 'Climate Zone'].

BACK TO REPORT

TABLE 221. AVERAGE REFRIGERATOR SIZE PER HOUSEHOLD BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 191, VOLUME 5, IN 2015 RSBS.

Size (Cubic Feet)	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	19.9	0.8	20.2▲	0.5	19.8	1.0	20.0▲	0.5
Refrigerators (n)	120	120	352	352	120	120	592	592

Note: This table includes all refrigerators, including mini fridges.

Source: On-site fields: ['Size of Refrigerator or Freezer (cu ft)', 'Number of Appliance Units', 'Climate Zone'].

TABLE 222. DISTRIBUTION OF REFRIGERATOR COUNT BY CLIMATE ZONE (SURVEY)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Refrigerator Size		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Full Size	0	0.4%	0.4%	0.3%	0.3%	0.5%	0.6%	0.4%	0.3%
	1	65.9%	3.4%	75.2%	2.3%	76.4%	3.4%	71.0%	1.9%
	2	29.7%	3.3%	21.4%	2.2%	20.4%	3.3%	25.2%	1.9%
	3	3.9%	1.4%	2.9%	0.9%	2.7%	1.3%	3.4%	0.8%
	4	0.2%	0.3%	0.1%	0.2%	0.0%	0.0%	0.1%	0.2%
Compact	0	85.2%	2.6%	86.2%	1.9%	85.3%	2.9%	85.6%	1.5%
	1	14.0%	2.5%	12.3%	1.8%	13.3%	2.7%	13.2%	1.4%
	2	0.6%	0.6%	1.5%	0.7%	1.2%	0.9%	1.0%	0.4%
	3	0.2%	0.3%	0.0%	0.0%	0.2%	0.4%	0.1%	0.2%
Respondents (n)		553	553	1,332	1,332	532	532	2,417	2,417

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: Survey fields: ['Fridge Description', 'Number of Other Fridges', 'Number of Compact Fridges', 'Climate Zone'].

BACK TO REPORT

TABLE 223. FREEZER ENERGY STAR BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 193, VOLUME 5, IN 2015 RSBS.

ENERGY STAR	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	29.2%	16.0%	20.4%	8.4%	36.9%▲	15.7%	27.4%▲	8.0%
No	70.8%▲	16.0%	79.6%	8.4%	63.1%	15.7%	72.6%▲	8.0%
Freezers (n)	24	24	77	77	34	34	135	135

Note: This table represents the percentage of stand-alone freezers labeled as ENERGY STAR or that project staff could identify through look-ups as ENERGY STAR certified. Look-ups of older appliances often do not indicate whether they were ENERGY STAR certified when new.

Source: On-site fields: ['Type/Style of Appliance', 'Appliance Energy Star Certified?', 'Number of Appliance Units', 'Climate Zone'].

TABLE 224. AVERAGE AGE OF STAND-ALONE FREEZERS BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 58, VOLUME 1, IN 2015 RSBS.

Freezer Type		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
First Stand-Alone Freezer	Age (Years)	10.2	1.3	11.3▼	0.9	10.9▲	1.0	10.9	0.6
	Respondents (n)	113	113	457	457	235	235	805	805
Second Stand-Alone Freezer	Age (Years)	6.7	26.9	14.4	5.6	8.5	2.2	10.2	2.5
	Respondents (n)	3	3	16	16	27	27	46	46
Third Stand-Alone Freezer	Age (Years)	1.0	0.0	17.8	65.0	7.9	0.0	8.7	12.3
	Respondents (n)	1	1	3	3	2	2	6	6

Source: Survey fields: ['Age of First Freezer', 'Age of Second Freezer', 'Age of Third Freezer', 'Climate Zone'].

TABLE 225. AVERAGE FREEZER YEAR OF MANUFACTURER PER HOUSEHOLD BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 59, VOLUME 1, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	3.8%▼	6.5%	6.3%	4.5%	14.1%	9.6%	6.3%▼	3.7%
2 to 4 Years	11.5%▼	10.8%	4.1%▼	3.6%	11.3%	8.8%	8.7%	5.3%
5 to 9 Years	26.9%	14.9%	22.9%	7.8%	16.6%	10.4%	23.9%	7.6%
10 to 14 Years	23.1%	14.2%	15.1%	6.7%	19.3%	11.0%	19.5%	7.2%
15 to 19 Years	11.5%	10.8%	23.9%	7.9%	13.9%	9.6%	16.5%	6.0%
20 or More Years	23.1%	14.2%	27.8%	8.3%	24.8%	12.1%	25.1%	7.4%
Mean Year of Manufacture	2005	3.5	2002	2.4	2006	2.8	2004	1.9
Respondents (n)	26	26	101	101	44	44	171	171

Source: On-site fields: ['Appliance Manufacture Year', 'Number of Appliance Units', 'Climate Zone'].

BACK TO REPORT

TABLE 226. DISTRIBUTION OF STAND-ALONE FREEZER COUNT BY CLIMATE ZONE (SURVEY)

THIS TABLE IS NEW WITH THE 2019 RBSA.

freezer count	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
0	77.0%	3.0%	60.2%	2.6%	48.9%	4.0%	66.5%	1.9%
1	22.1%	3.0%	38.2%	2.6%	45.4%	4.0%	31.6%	1.9%
2	0.8%	0.6%	1.4%	0.6%	5.4%	1.8%	1.7%	0.5%
3	0.2%	0.3%	0.1%	0.2%	0.3%	0.4%	0.2%	0.2%
4	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%	0.1%
Respondents (n)	553	553	1,333	1,333	533	533	2,419	2,419

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: Survey fields: ['Number of Freezers', 'Climate Zone'].

TABLE 227. REFRIGERATOR AND FREEZER LOCATION BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 59, VOLUME 1, IN 2015 RSBS.

Appliance Type	Location	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Refrigerator/Freezers, Refrigerators	Conditioned	90.2%	4.4%	86.9%	3.4%	89.5%	5.2%	88.9%	2.6%
	Unconditioned	9.8%	4.4%	13.1%	3.4%	10.5%	5.2%	11.1%	2.6%
	Refrigerators (n)	123	123	355	355	122	122	600	600
Freezers	Conditioned	50.0%	16.2%	38.2%	8.7%	38.6%	13.0%	43.0%	7.7%
	Unconditioned	50.0%	16.2%	61.8%	8.7%	61.4%	13.0%	57.0%	7.7%
	Freezers (n)	28	28	110	110	47	47	185	185

Source: On-site fields: ['Location of Appliance Unit', 'Number of Appliance Units', 'Climate Zone'].

BACK TO REPORT

TABLE 228. DISHWASHER ENERGY STAR BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 194, VOLUME 5, IN 2015 RSBS.

ENERGY STAR	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	47.5%	10.9%	70.5%▲	6.6%	75.9%▲	11.1%	59.4%▲	6.3%
No	52.5%▲	10.9%	29.5%	6.6%	24.1%	11.1%	40.6%	6.3%
Dishwashers (n)	61	61	187	187	57	57	305	305

Note: This table represents the percentage of dishwashers labeled as ENERGY STAR or that project staff could identify through look-ups as ENERGY STAR certified. Look-ups of older appliances often do not indicate whether they were ENERGY STAR certified when new.

Source: On-site fields: [‘Climate Zone,’ ‘Type/Style of Appliance,’ ‘Appliance Energy Star Certified?’].

TABLE 229. AVERAGE NUMBER OF DISHWASHER LOADS PER WEEK BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 224, VOLUME 5, IN 2015 RSBS.

Loads per Week	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	3.4	0.5	3.1	0.3	3.3	0.6	3.3	0.3
Dishwashers (n)	81	81	229	229	74	74	384	384

Source: On-site fields: ['Dishwasher Usage Pattern (cycles/week)', 'Number of Appliance Units', 'Climate Zone'].

TABLE 230. WINE COOLER AGE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 195, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	40.0%	52.4%	19.0%	16.8%	0.0%	0.0%	27.2%	19.6%
2 to 4 Years	0.0%	0.0%	13.0%	14.2%	2.7%	7.7%	6.3%▼	7.1%
5 to 9 Years	20.0%	42.8%	43.3%	21.3%	97.3%▲	7.7%	36.7%	19.0%
10 to 14 Years	20.0%	42.8%	12.3%	14.2%	0.0%	0.0%	14.9%	15.6%
15 to 19 Years	0.0%	0.0%	12.3%	14.2%	0.0%	0.0%	5.8%	7.1%
20 or More Years	20.0%	42.8%	0.0%	0.0%	0.0%	0.0%	9.1%	14.6%
Wine Coolers (n)	5	5	24	24	5	5	34	34

Source: On-site fields: ['Appliance Manufacture Year', 'Number of Appliance Units', 'Climate Zone'].

TABLE 231. PERCENTAGE OF HOMES USING DEHUMIDIFIERS BY SEASON AND CLIMATE ZONE (SITE)

COMPARE WITH TABLE 223, VOLUME 5, IN 2015 RSBS.

Season	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Summer	82.8%	12.2%	55.9%	7.5%	72.5%	12.1%	67.7%	6.0%
Fall	13.8%	11.1%	19.8%	6.5%	12.5%	8.9%	16.5%	5.0%
Winter	6.9%	8.2%	6.6%	3.5%	0.0%	0.0%	5.5%	3.1%
Spring	17.2%	12.2%	35.1%▲	7.3%	30.0%▲	12.4%	28.3%▲	5.8%
Year Round	13.8%	11.1%	29.5%	7.0%	25.1%	11.7%	23.6%	5.4%
Dehumidifiers (n)	29	29	174	174	45	45	248	248

Note: Fall dehumidifier usage was not represented in the corresponding table in the 2015 RSBS.

Source: On-site fields: ['Humidifier Usage', 'Number of Appliance Units', 'Climate Zone'].

TABLE 232. DEHUMIDIFIER AGE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 200, VOLUME 5, IN 2015 RSBS.

Age	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Less than 2 Years	3.6%▼	6.0%	14.7%	5.7%	22.6%	11.2%	12.5%▼	4.1%
2 to 4 Years	7.1%▼	8.3%	21.6%	6.0%	22.6%	12.0%	17.1%▼	4.6%
5 to 9 Years	32.1%	15.1%	43.2%▲	7.7%	27.4%	12.0%	36.7%▲	6.5%
10 to 14 Years	25.0%	14.0%	9.8%	4.3%	12.5%	8.8%	15.3%	5.3%
15 to 19 Years	14.3%	11.3%	3.8%▼	2.8%	7.5%	7.0%	7.9%	4.1%
20 or More Years	17.9%	12.4%	6.8%	3.7%	7.5%	7.0%	10.5%	4.6%
Dehumidifiers (n)	28	28	167	167	45	45	240	240

Source: On-site fields: ['Type/Style of Appliance', 'Appliance Manufacture Year', 'Number of Appliance Units', 'Climate Zone'].

TABLE 233. AVERAGE DEHUMIDIFIER YEAR OF MANUFACTURER PER HOUSEHOLD BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 201, VOLUME 5, IN 2015 RSBS.

Year of Manufacture	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	2006	3	2011▲	1	2011▲	2	2010▲	1
Dehumidifier (n)	28	28	167	167	45	45	240	240

Source: On-site fields: ['Number of Appliance Units', 'Appliance Manufacture Year', 'Climate Zone'].

TABLE 234. DEHUMIDIFIER ENERGY STAR BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 202, VOLUME 5, IN 2015 RSBS.

ENERGY STAR	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	29.2%▼	16.0%	62.8%	7.9%	53.1%	14.9%	49.7%▼	7.4%
No	70.8%▲	16.0%	37.2%	7.9%	46.9%	14.9%	50.3%▲	7.4%
Dehumidifiers (n)	24	24	130	130	37	37	191	191

Note: This table represents the percentage of dehumidifiers labeled as ENERGY STAR or that project staff could identify through look-ups as ENERGY STAR certified. Look-ups of older appliances often do not indicate whether they were ENERGY STAR certified when new.

Source: On-site fields: ['Type/Style of Appliance', 'Appliance Energy Star Certified?', 'Number of Appliance Units', 'Climate Zone'].

TABLE 235. POOL HEATED BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 61, VOLUME 1, IN 2015 RSBS.

Heated Pool	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	18.2%	21.6%	33.7%	19.2%	25.4%	28.1%	23.8%	13.0%
No	81.8%	21.6%	66.3%	19.2%	74.6%	28.1%	76.2%	13.0%
Pools (n)	11	11	23	23	11	11	45	45

Note: This table does not include hot tubs.

Source: On-Site fields: ['Heated Pool /Hot Tub', 'Number of Appliance Units', 'Climate Zone']

TABLE 236. POOL PUMP HIGH EFFICIENCY BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 62, VOLUME 1, IN 2015 RSBS.

High Efficiency	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	27.3%	24.9%	11.3%	12.8%	25.4%	28.1%	22.4%	13.9%
No	45.5%	27.8%	55.1%	20.2%	37.1%	31.4%	46.9%	15.9%
Not Available	27.3%	24.9%	33.5%	19.2%	37.5%	31.4%	30.7%	14.5%
Pools (n)	11	11	23	23	11	11	45	45

Note: This table does not include hot tubs.

Source: On-site fields: ['Pool/Hot Tub High Efficiency Pump', 'Number of Appliance Units', 'Climate Zone'].

TABLE 237. POOL IN GROUND BY CLIMATE ZONE (SITE)
COMPARE WITH TABLE 203, VOLUME 5, IN 2015 RSBS.

Location	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Above Ground	54.5%	27.8%	60.8%	19.8%	37.8%	31.4%	53.7%	15.9%
In Ground	45.5%	27.8%	39.2%	19.8%	62.2%	31.4%	46.3%	15.9%
Pools (n)	11	11	23	23	11	11	45	45

Note: This table does not include hot tubs.

Source: On-site fields: ['Pool/Hot Tub Above Ground or In Ground', 'Number of Appliance Units', 'Climate Zone'].

TABLE 238. HOT TUB PUMP HIGH EFFICIENCY BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 206, VOLUME 5, IN 2015 RSBS.

High Efficiency	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Yes	0.0%	0.0%	0.2%▼	0.4%	14.3%	27.1%	3.9%▼	6.5%
No	33.3%	174.5%	42.3%	22.7%	28.6%	34.9%	36.0%	18.7%
Not Available	66.7%	174.5%	57.5%	22.7%	57.1%	38.3%	60.1%	19.0%
Hot Tub Pumps (n)	3	3	23	23	7	7	33	33

Source: On-site fields: ['Pool/Hot Tub High Efficiency Pump', 'Number of Appliance Units', 'Climate Zone'].

TABLE 239. POOL FUEL BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 207, VOLUME 5, IN 2015 RSBS.

Fuel	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Electricity	36.4%	26.9%	22.2%	16.9%	0.7%▼	1.0%	26.6%	14.9%
Not Heated	45.5%	27.8%	44.3%	20.2%	74.2%	28.1%	49.6%	16.0%
Natural Gas	0.0%	0.0%	22.5%	16.9%	24.7%	28.1%	10.4%	7.2%
Propane	18.2%	21.6%	0.0%	0.0%	0.3%▼	0.7%	10.1%	11.2%
Solar Hot Water[a]	0.0%	0.0%	11.0%	12.8%	0.0%	0.0%	3.2%	3.9%
Pools (n)	11	11	23	23	11	11	45	45

Note: This table does not include hot tubs.
[a] The solar hot water fuel type was not represented in the corresponding table of the 2015 RSBS.

Source: On-site fields: ['Type/Style of Appliance', 'Number of Appliance Units', 'Appliance Fuel', 'Climate Zone'].

TABLE 240. AVERAGE NUMBER OF TELEVISIONS PER HOUSEHOLD BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 67, VOLUME 1, IN 2015 RSBS.

Number of Televisions	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	3.0	0.3	2.6	0.1	2.8▲	0.3	2.8	0.2
Respondents (n)	81	81	272	272	89	89	442	442

Source: On-site fields: ['Number of Appliance Units', 'Appliance Category', 'Climate Zone'].

TABLE 241. AVERAGE NUMBER OF TELEVISIONS BY TYPE AND CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 68, VOLUME 1, IN 2015 RSBS.

Television Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Flat Screen LCD/LED	2.0▲	0.1	1.9▲	0.1	1.8▲	0.1	1.9▲	0.1
Flat Screen of Unknown type	0.4	0.1	0.3▲	0.0	0.3	0.1	0.3▲	0.0
Flat Screen Plasma	0.3▼	0.1	0.2▼	0.0	0.1▼	0.0	0.2▼	0.0
Cathode Ray Tube	0.2▼	0.0	0.1▼	0.0	0.1▼	0.0	0.2▼	0.0
Rear Projection	0.0▲	0.0	0.0▲	0.0	0.0	0.0	0.0▲	0.0
Respondents (n)	545	545	1,325	1,325	526	526	2,396	2,396

Source: Survey fields: ['No. of Standard Tube TVs', 'No. of Plasma TVs', 'No. of LCD/LED TVs', 'No. of TVs of Unknown Type', 'No. of Rear Projection TVs', 'Climate Zone'].

TABLE 242. AVERAGE NUMBER OF TELEVISIONS BY TYPE AND CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Televisions		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
Flat Screen LCD/LED	Mean	2.6	0.3	2.3	0.1	2.5	0.3	2.5	0.2
	Respondents (n)	81	81	272	272	89	89	442	442
Cathode Ray Tube	Mean	0.2	0.1	0.2	0.0	0.1	0.1	0.2	0.0
	Respondents (n)	81	81	272	272	89	89	442	442
Flat Screen Plasma	Mean	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.0
	Respondents (n)	81	81	272	272	89	89	442	442
Rear Projection	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Respondents (n)	81	81	272	272	89	89	442	442

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['Type/Style of Appliance', 'Number of Appliance Units', 'Appliance Category', 'Climate Zone'].

TABLE 243. AVERAGE TELEVISION SIZE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 213, VOLUME 5, IN 2015 RSBS.

Size (inches)	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	39.3▲	1.4	39.1▲	1.0	37.8▲	1.5	39.0▲	0.8
Respondents (n)	81	81	272	272	88	88	441	441

Source: On-site fields: ['Television Screen Size (inches)', 'Number of Appliance Units', 'Climate Zone'].

TABLE 244. AVERAGE TELEVISION SIZE BY TELEVISION TYPE (SITE)

COMPARE WITH TABLE 214, VOLUME 5, IN 2015 RSBS.

Size (inches)	Cathode Ray Tube		LCD		LED		Plasma		Projection		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	23.8	2.0	36.8▲	1.1	41.7▲	1.1	42.4	2.9	65.1	15.1	39.0▲	0.8
Respondents (n)	22	22	160	160	227	227	28	28	4	4	441	441

Source: On-site fields: ['Type/Style of Appliance', 'Television Screen Size (inches)', 'Number of Appliance Units'].

BACK TO REPORT

TABLE 245. TELEVISION TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 215, VOLUME 5, IN 2015 RSBS.

Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
LED	55.0%▲	5.5%	43.9%▲	3.9%	55.3%▲	6.5%	51.1%▲	3.2%
LCD	32.6%	5.2%	42.5%▲	3.9%	33.1%	6.1%	36.2%	3.1%
Cathode Ray Tube	6.2%▼	2.6%	6.7%▼	1.8%	5.2%▼	2.9%	6.2%▼	1.5%
Plasma	5.4%	2.4%	4.9%	1.5%	4.8%	2.8%	5.1%	1.4%
Organic LED	0.4%	0.7%	1.3%	0.8%	0.5%	0.9%	0.8%	0.5%
Projection	0.4%	0.7%	0.8%	0.6%	1.0%	1.2%	0.6%	0.4%
Televisions (n)	242	242	714	714	249	249	1,205	1,205

Source: On-site fields: ['Type/Style of Appliance', 'Number of Appliance Units', 'Climate Zone'].

BACK TO REPORT

TABLE 246. AVERAGE NUMBER OF PLUG LOAD EQUIPMENT PER HOUSEHOLD BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 69, VOLUME 1, IN 2015 RSBS.

Plug Load	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Cell Phones	2.5▲	0.1	2.1▲	0.1	1.9▲	0.1	2.3▲	0.1
Cordless Phone	1.8	0.1	1.2	0.1	1.3	0.1	1.5	0.1
Cable Satellite	0.8▼	0.1	0.5▼	0.0	0.6▼	0.1	0.6▼	0.1
DVD/Blue Ray Player	0.6▼	0.1	0.7▼	0.0	0.7▼	0.1	0.7▼	0.0
Video Gaming System	0.5▼	0.1	0.5▼	0.0	0.5	0.1	0.5▼	0.0
Stereo System	0.5▼	0.0	0.4▼	0.0	0.5▼	0.1	0.5▼	0.0
VCR	0.2▼	0.0	0.2▼	0.0	0.2▼	0.0	0.2▼	0.0
Respondents (n)	529	529	1,267	1,267	510	510	2,306	2,306

Source: Survey fields: ['Number of DVD/Blu-Rays', 'No. of Combination TV Boxes', 'No. of TV Boxes', 'Number of DVRs', 'Number of Gaming Systems', 'Number of Home Theater Systems', 'Number of Cell/Smart Phones', 'Number of Cordless Phones', 'Number of Stereo Systems', 'Number of VCRs', 'Number of Digital Converters', 'Climate Zone'].

BACK TO REPORT

TABLE 247. SMART STRIPS USAGE AND TYPE BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 66, VOLUME 1, IN 2015 RSBS.

Category		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Use Smart Strip	Yes	14.1%	2.6%	12.7%	1.8%	8.8%▼	2.4%	12.8%	1.5%
	No	85.9%	2.6%	87.3%	1.8%	91.2%▲	2.4%	87.2%	1.5%
	Respondents (n)	524	524	1,280	1,280	512	512	2,316	2,316
Type of Smart Strip	Tier 1 Smart Strip That Turns Off When Computer is Powered Off or Goes to Sleep	74.1%	12.5%	81.8%	8.6%	89.8%	11.3%	78.8%	7.2%
	Tier 2 Smart Strip That Turns Off When You Leave or is Programmed to Turn Off at a Certain Time	11.6%	9.1%	9.1%	6.4%	5.1%	8.2%	9.9%	5.3%
	Both Tier 1 and Tier 2 Smart Strip	14.3%	10.0%	9.1%	6.4%	5.1%	8.2%	11.3%	5.7%
	Respondents (n)	36	36	79	79	29	29	144	144

Source: Survey fields: ['Smart Strip to Power Off', 'Tiered Smart Strip', 'Climate Zone'].

BACK TO REPORT

TABLE 248. AVERAGE NUMBER OF OFFICE EQUIPMENT TYPES BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 216, VOLUME 5, IN 2015 RSBS.

Office Equipment	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Desktop Computer Excluding Monitor	0.8▲	0.1	0.6▲	0.0	0.7	0.1	0.7▲	0.0
Laptop Computer	1.4▲	0.1	1.2▲	0.1	1.1▼	0.1	1.3▲	0.0
Tablet Computer	1.1▲	0.1	1.0▲	0.1	1.0▲	0.1	1.0▲	0.0
Cathode Ray Tube Computer Monitor	0.1▲	0.0	0.0▲	0.0	0.0▼	0.0	0.0▲	0.0
LCD/LED Computer Monitor	0.7▲	0.1	0.6▲	0.0	0.6▼	0.1	0.6▲	0.0
eReader	0.3	0.0	0.3▲	0.0	0.4▲	0.1	0.3	0.0
Printer	0.9▲	0.0	0.9▲	0.0	0.8▲	0.1	0.9▲	0.0
Modem or Router	1.0▲	0.0	1.1▲	0.0	1.0▲	0.1	1.0▲	0.0
Respondents (n)	521	521	1,260	1,260	497	497	2,278	2,278

Source: Survey fields: ['Number of Desktop Computers', 'Number of Laptops', 'Number of Tablets', 'Number of CRT Computer Monitors', 'Number of LED/LCD Monitors', 'Number of eReaders', 'Number of All-In-One Printers', 'Number of Modems/Routers', 'Climate Zone'].

BACK TO REPORT

TABLE 249. AVERAGE NUMBER OF COMPUTERS PER HOUSEHOLD BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 63, VOLUME 1, IN 2015 RSBS.

Computers	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	Mean	EB	Mean	EB	Mean	EB	Mean	EB
Mean	3.2▲	0.1	2.8▲	0.1	2.8▲	0.1	3.0▲	0.1
Respondents (n)	521	521	1,260	1,260	497	497	2,278	2,278

Note: This table includes desktop, laptop, and tablet computers.

Source: Survey fields: ['Number of Desktop Computers', 'Number of Laptops', 'Number of Tablets', 'Climate Zone'].

TABLE 250. AVERAGE NUMBER OF HOURS COMPUTER USED PER DAY BY CLIMATE ZONE (SURVEY)

COMPARE WITH TABLE 64, VOLUME 1, IN 2015 RSBS.

Computer Type		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		Mean	EB	Mean	EB	Mean	EB	Mean	EB
Desktop Computer	Mean	2.8	0.3	2.2▼	0.2	2.6▼	0.4	2.6▼	0.2
	Respondents (n)	349	349	788	788	318	318	1,455	1,455
Laptop Computer	Mean	3.1	0.2	2.4▼	0.2	2.5▼	0.3	2.8▼	0.1
	Respondents (n)	417	417	1,053	1,053	401	401	1,871	1,871

Source: Survey fields: ['Desktop Daily Hours', 'Laptop Daily Hours', 'Climate Zone'].

BACK TO REPORT

TABLE 251. COMPUTER TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 218, VOLUME 5, IN 2015 RSBS.

Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Laptop	49.4%	7.8%	55.2%▲	5.1%	49.0%	9.4%	51.3%	4.6%
Desktop	34.6%	7.0%	28.7%▼	4.4%	37.7%	8.7%	32.9%	4.1%
Tablet	16.0%	5.4%	16.1%	4.0%	13.4%	6.8%	15.7%	3.2%
Computers (n)	231	231	632	632	187	187	1,050	1,050

Source: On-site fields: ['Type/Style of Appliance', 'Number of Appliance Units', 'Climate Zone'].

TABLE 252. COMPUTER MONITOR TYPE BY CLIMATE ZONE (SITE)

COMPARE WITH TABLE 219, VOLUME 5, IN 2015 RSBS.

Monitor Type	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
LED	66.7%	7.3%	28.8%	4.9%	38.3%	8.9%	50.0%	4.7%
LCD	30.7%	7.2%	34.7%	5.0%	39.2%	9.4%	33.2%	4.3%
LCD or LED	1.3%	1.6%	35.9%	5.1%	21.2%	8.0%	15.7%	2.6%
Cathode Ray Tube[a]	0.9%	1.0%	0.0%	0.0%	1.4%	1.6%	0.6%▼	0.6%
Plasma	0.4%	0.7%	0.2%	0.3%	0.0%	0.0%	0.3%	0.4%
All-in-One Computer	0.0%	0.0%	0.4%	0.7%	0.0%	0.0%	0.1%	0.2%
Computer Monitors (n)	231	231	624	624	185	185	1,040	1,040

Note: This table represents display type for desktop and laptop computers.
[a] Only cathode ray tube values can be meaningfully compared with 2015 RSBS results.

Source: On-site fields: ['Number of Appliance Units', 'Computer Monitor Type', 'Climate Zone'].

TABLE 253. PERCENTAGE OF HOMES WITH CONNECTED DEVICES BY DEVICE TYPE AND CLIMATE ZONE (SURVEY)
THIS TABLE IS NEW WITH THE 2019 RBSA.

Category		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Home Includes Equipment That Can be Controlled Remotely	Yes	31%	3%	20%	2%	13%	3%	24%	2%
	No	69%	3%	80%	2%	87%	3%	76%	2%
	Respondents (n)	543	543	1,313	1,313	526	526	2,382	2,382
Items That Can be Controlled Remotely	Thermostats	54%	7%	51%	7%	34%	12%	52%	5%
	Security	39%	7%	32%	6%	36%	12%	37%	5%
	LEDs or Smart Lights	32%	7%	35%	6%	40%	12%	33%	5%
	Heating or Cooling Equipment	30%	7%	27%	6%	19%	10%	28%	4%
	Other	16%	5%	20%	5%	31%	12%	19%	4%
	Pool Pump	2%	2%	1%	1%	0%	0%	2%	1%
	Major Appliances	1%	1%	3%	2%	5%	5%	2%	1%
	Whole-House Humidifying	1%	1%	2%	2%	0%	0%	1%	1%
	Water Heating Equipment	1%	1%	1%	1%	2%	4%	1%	1%
	Whole-House Dehumidifying	1%	1%	0%	0%	0%	0%	0%	1%
	Respondents (n)	145	145	283	283	76	76	504	504
Major Appliances That Can be Controlled Remotely	Dishwasher	1%	1%	1%	1%	0%	0%	1%	1%
	Clothes Washer or Dryer	0%	0%	1%	1%	0%	0%	0%	0%
	Full-Sized Refrigerator	0%	0%	0%	0%	2%	4%	0%	0%
	Other Appliance	0%	0%	0%	0%	2%	4%	0%	0%
	Cooktop Stovetop or Range	0%	0%	0%	0%	0%	0%	0%	0%
	Stand-Alone Freezer	0%	0%	0%	0%	0%	0%	0%	0%
	Stand-Alone Oven	0%	0%	0%	0%	0%	0%	0%	0%
	Respondents (n)	145	145	283	283	76	76	504	504

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: Survey fields: ['Remote Controlled Equipment', 'Remote Equipment-Heat/Cool', 'Remote Equipment-Thermostat', 'Remote Equipment-Water Heating', 'Remote Equipment-Smart Lights', 'Remote Equipment-Humidifier', 'Remote Equipment-Dehumidifier', 'Remote Equipment-Pool Pump', 'Remote Equipment-Security', 'Remote Equipment-Appliance', 'Remote Equipment-Other Notes', 'Remote Appliance-Washer Dryer', 'Remote Appliance-Dishwasher', 'Remote Appliance-Cooktop', 'Remote Appliance-Oven', 'Remote Appliance-Refrigerator', 'Remote Appliance-Freezer', 'Remote Appliance-Other Notes', 'Climate Zone'].

BACK TO REPORT

TABLE 254. PERCENTAGE OF HOMES WITH CONNECTED DEVICES BY DEVICE TYPE AND HOME VINTAGE (SURVEY)
THIS TABLE IS NEW WITH THE 2019 RBSA.

Category		Existing Homes		New Homes		Overall Statewide	
		%	EB	%	EB	%	EB
Home Includes Equipment That Can be Controlled Remotely	Yes	24.0%	1.9%	35.1%	4.8%	24.1%	1.9%
	No	76.0%	1.9%	64.9%	4.8%	75.9%	1.9%
	Respondents (n)	1,810	1,810	572	572	2,382	2,382
Items That Can be Controlled Remotely	Thermostats	51.3%	4.9%	69.9%	7.7%	51.5%	4.9%
	Security	36.5%	4.8%	60.0%	8.1%	36.8%	4.7%
	LEDs or Smart Lights	33.3%	4.6%	36.2%	9.0%	33.3%	4.6%
	Heating or Cooling Equipment	28.1%	4.5%	28.8%	8.1%	28.1%	4.4%
	Other	18.7%	3.8%	14.4%	4.3%	18.7%	3.7%
	Pool Pump	1.8%	1.4%	3.6%	4.6%	1.8%	1.4%
	Major Appliances	1.6%	1.1%	2.4%	1.7%	1.6%	1.1%
	Whole-House Humidifying	1.1%	0.9%	1.2%	1.1%	1.1%	0.9%
	Water Heating Equipment	1.0%	0.9%	3.6%	4.6%	1.1%	0.9%
	Whole-House Dehumidifying	0.5%	0.8%	0.0%	0.0%	0.5%	0.7%
	Respondents (n)	330	330	174	174	504	504
Major Appliances That Can be Controlled Remotely	Dishwasher	0.7%	0.8%	0.0%	0.0%	0.7%	0.8%
	Clothes Washer or Dryer	0.4%	0.5%	0.8%	0.9%	0.4%	0.5%
	Full-Sized Refrigerator	0.2%	0.3%	1.7%	1.4%	0.2%	0.3%
	Other Appliance	0.2%	0.3%	0.0%	0.0%	0.2%	0.3%
	Cooktop Stovetop or Range	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Stand-Alone Freezer	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Stand-Alone Oven	0.0%	0.0%	0.4%	0.6%	0.0%	0.0%
	Respondents (n)	330	330	174	174	504	504

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: Survey fields: ['Remote Controlled Equipment', 'Remote Equipment-Heat/Cool', 'Remote Equipment-Thermostat', 'Remote Equipment-Water Heating', 'Remote Equipment-Smart Lights', 'Remote Equipment-Humidifier', 'Remote Equipment-Dehumidifier', 'Remote Equipment-Pool Pump', 'Remote Equipment-Security', 'Remote Equipment-Appliance', 'Remote Equipment-Other Notes', 'Remote Appliance-Washer Dryer', 'Remote Appliance-Dishwasher', 'Remote Appliance-Cooktop', 'Remote Appliance-Oven', 'Remote Appliance-Refrigerator', 'Remote Appliance-Freezer', 'Remote Appliance-Other Notes', 'Construction Type'].

TABLE 255. PERCENTAGE OF HOMES WITH CONNECTED/SMART DEVICES BY CLIMATE ZONE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Connected Devices	Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
	%	EB	%	EB	%	EB	%	EB
Digital Assistant/Smart Speaker	32.9%	8.5%	24.3%	4.9%	25.6%	8.7%	28.6%	4.6%
Thermostat	28.2%	8.2%	14.2%	4.0%	10.1%	5.9%	20.2%	4.3%
Security	25.9%	7.9%	13.2%	3.9%	4.3%	4.0%	17.8%	4.1%
Lighting	7.1%	4.6%	9.8%	3.4%	1.5%	2.4%	7.2%	2.5%
Outlets	7.1%	4.6%	5.3%	2.6%	4.2%	4.0%	6.0%	2.5%
Safety	5.9%	4.3%	4.4%	2.3%	1.5%	2.4%	4.7%	2.2%
Cooking	5.9%	4.3%	1.0%	1.1%	0.0%	0.0%	3.2%	2.1%
Sprinklers	5.9%	4.3%	0.0%	0.0%	0.0%	0.1%	2.8%	2.0%
Respondents (n)	85	85	274	274	92	92	451	451

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['General Connected Devices Thermostat', 'General Connected Devices Sprinkler Control', 'General Connected Devices Security', 'General Connected Devices Safety', 'General Connected Devices Outlet', 'General Connected Devices Lighting', 'General Connected Devices Cooking', 'General Connected Devices Assistant', 'Climate Zone', 'Construction Type'].

TABLE 256. PERCENTAGE OF HOMES WITH CONNECTED/SMART DEVICES BY HOME VINTAGE (SITE)

THIS TABLE IS NEW WITH THE 2019 RBSA.

Connected Devices	Existing Homes		New Homes		Overall Statewide	
	%	EB	%	EB	%	EB
Digital Assistant/Smart Speaker	28.6%	4.6%	26.3%	7.7%	28.6%	4.6%
Thermostat	20.2%	4.3%	27.3%	7.8%	20.2%	4.3%
Security	17.9%	4.1%	16.1%	6.4%	17.8%	4.1%
Lighting	7.2%	2.6%	15.3%	6.3%	7.2%	2.5%
Outlets	6.0%	2.5%	3.2%	3.0%	6.0%	2.5%
Safety	4.6%	2.2%	9.7%	5.2%	4.7%	2.2%
Cooking	3.2%	2.1%	0.0%	0.0%	3.2%	2.1%
Sprinklers	2.8%	2.0%	1.3%	2.1%	2.8%	2.0%
Respondents (n)	361	361	90	90	451	451

Note: This table is new to the 2019 RBSA and its values cannot be compared with those of any 2015 RSBS table.

Source: On-site fields: ['General Connected Devices Thermostat', 'General Connected Devices Sprinkler Control', 'General Connected Devices Security', 'General Connected Devices Safety', 'General Connected Devices Outlet', 'General Connected Devices Lighting', 'General Connected Devices Cooking', 'General Connected Devices Assistant', 'Construction Type'].

BACK TO REPORT

TABLE 257. AWARENESS OF AND PARTICIPATION IN ENERGY EFFICIENCY PROGRAMS BY CLIMATE ZONE (SURVEY)
COMPARE WITH TABLE 70, VOLUME 1, IN 2015 RSBS.

Category		Climate Zone 4		Climate Zone 5		Climate Zone 6		Overall Statewide	
		%	EB	%	EB	%	EB	%	EB
Participated in Energy Efficiency Program	Yes	9.2%	2.1%	11.4%	1.7%	12.0%	2.7%	10.5%	1.3%
	No	90.8%	2.1%	88.6%	1.7%	88.0%	2.7%	89.5%	1.3%
	Respondents (n)	539	539	1,297	1,297	523	523	2,359	2,359
Equipment Purchased or Recycled through Program	Insulation	31.0%	11.6%	49.9%	8.4%	38.3%	12.0%	39.8%	6.3%
	Air Conditioning Equipment	41.9%▲	12.4%	16.3%	6.2%	6.4%	6.0%	25.4%▲	6.1%
	Heating Equipment	22.0%	10.4%	32.6%	7.9%	23.4%	10.4%	26.5%	5.6%
	Lighting	26.6%	11.1%	14.3%	5.9%	8.5%▼	6.9%	18.4%	5.4%
	Other	11.2%	7.9%	14.4%	5.9%	29.7%	11.3%	15.8%	4.5%
	Water Heating Equipment	19.8%	10.0%	15.3%	6.0%	8.5%	6.9%	16.0%	5.0%
	Refrigerator or Freezer Recycling	15.4%	9.1%	15.3%	6.0%	10.6%	7.6%	14.5%	4.6%
	Clothes Washer	6.8%	6.2%	5.1%	3.7%	2.1%	3.6%	5.3%	3.0%
	Appliances	11.4%	7.9%	8.1%	4.6%	4.3%	5.0%	8.9%	3.8%
	Respondents (n)	51	51	114	114	51	51	216	216
Reason for Not Participating in Program	Not Aware of Any Reason	55.2%	4.1%	51.5%	3.1%	51.8%	4.6%	53.3%	2.4%
	Do Not Know Who to Contact	28.2%▲	3.7%	31.7%▲	2.9%	29.5%▲	4.2%	29.7%▲	2.2%
	Can Not Afford to Install New Equipment	28.7%▲	3.8%	29.7%▲	2.8%	29.7%▲	4.2%	29.2%▲	2.2%
	Energy Bills Are Not That High	15.0%▲	3.0%	21.4%▲	2.5%	16.1%	3.4%	17.6%▲	1.8%
	Other	11.2%	7.9%	14.4%	5.9%	29.7%	11.3%	15.8%	4.5%
	Too Busy	8.9%	2.4%	7.1%	1.6%	9.7%▲	2.7%	8.4%	1.3%
	Do Not Need Anything Done	7.9%▼	2.2%	8.3%▼	1.7%	8.4%▼	2.5%	8.1%▼	1.3%
	Recently Moved	3.2%	1.4%	6.8%	1.5%	3.9%	1.7%	4.6%	0.9%
	Renter	0.0%	0.0%	2.9%▼	1.0%	2.5%▼	1.4%	1.4%▼	0.4%
	Respondents (n)	421	421	1,049	1,049	424	424	1,894	1,894

Source: Survey fields: ['Efficiency Program Participation', 'Past-Insulation/Weatherization', 'Past-Heating', 'Past-Air Conditioning ', 'Past-Lighting', 'Past-Water Heating', 'Past-Clothes Washer', 'Past-Appliances', 'Past-Refrigeration', 'Past-Other Equipment Notes', 'Non Participation-Awareness', 'Non Participation-Don't Know', 'Non Participation-Not Needed', 'Non Participation-Initiation', 'Non Participation-High Cost', 'Non Participation-Low Bills', 'Non Participation-Rent', 'Non Participation-Other Notes', 'Non Participation-Too Busy', 'Non Participation-Recent Move', 'Primary Air Conditioning Type', 'Climate Zone', 'Construction Type'].

BACK TO REPORT

APPENDIX B. DETAILED METHODOLOGY

This appendix to the New York State Energy Research and Development Authority (NYSERDA) 2019 *Residential Building Stock Assessment* (RBSA) report provides more information about the study methodology than would reasonably fit in the main body of the report. This appendix is intended for readers who use the study and need a deeper understanding of the study methodology.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

B.1 PROJECT SUMMARY

B.1.1 Background and Study Objectives

The NYSERDA 2019 RBSA provides the first update to the 2015 *Residential Statewide Baseline Study* (RSBS) of New York State. NYSERDA, in coordination with lead contractor Cadmus and subcontractors Performance Systems Development (PSD) and Honeywell, developed and implemented a work plan that allowed key study components to be completed in time to inform the State energy plan.

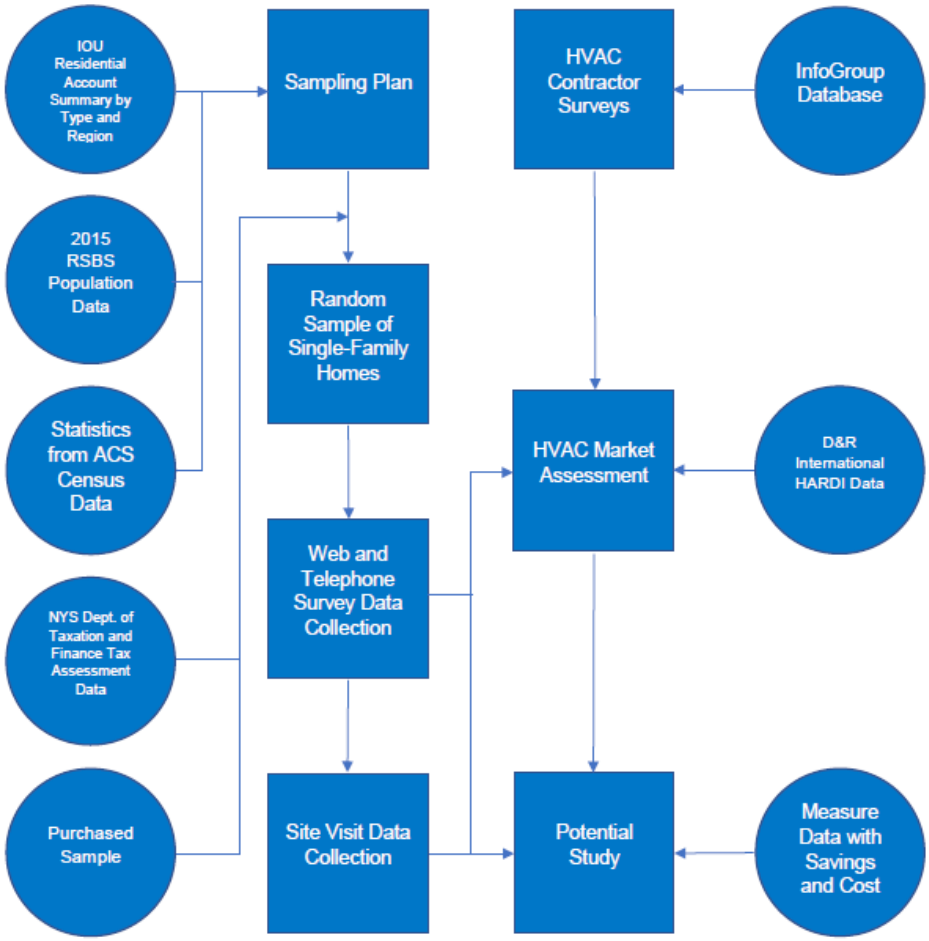
The project team characterized single-family homes throughout the State, with a single-family home defined as a residential structure containing one to four living units, including manufactured homes. Primary data collection included surveys of 2,419 respondents and site visits at 456 homes.

In addition to the building stock assessment, the RBSA included an HVAC market assessment to update baseline conditions for high-efficiency heating equipment in the State and a potential study to estimate three-, five-, and 10-year energy efficiency potential in the State. This appendix provides documentation of methods for the building assessment component only; separate reports and methodology documentation will be made available for the HVAC market assessment and potential study components.

The primary objectives of the RBSA are to provide a profile of new and existing homes in the State based on data from a representative sample of homes and to determine changes in building and equipment stock since the 2015 RSBS, including changes in the saturation of energy-consuming equipment (that uses electric, natural gas, and other fuels); key building characteristics such as insulation, windows types, and air leakage rates; and energy management practices. The RBSA also collected customer household and demographic information.

Information provided in this study will be used by NYSERDA, the New York State Department of Public Service, energy efficiency program administrators throughout the State, and others for a variety of purposes, such as informing program planning and setting baselines for savings calculations. This information also provided necessary inputs to the HVAC market assessment and potential study components of the study, as shown in Figure 1.

FIGURE 1. RESIDENTIAL BUILDING STOCK ASSESSMENT PROJECT FLOW CHART



B.1.2 Market Segment Definitions

The RBSA characterized single-family homes, which are defined for the study as residential structures comprising one to four living units. While single-family detached homes are by far the most common type of single-family home in the State, the study also collected data on single-family attached homes, such as townhouses, manufactured or mobile homes, and multi-unit buildings.

The study characterized both existing and new homes, with homes classified as new if they were constructed in 2015 or later.

B.1.3 Building Assessment Project Team

The project team for the building assessment component included NYSERDA, Cadmus as the lead contractor, and PSD and Honeywell as subcontractors.

As the lead contractor working under the direction of NYSERDA, Cadmus completed the following tasks:

- Managed all aspects of the project.

- Developed the work plan and sampling plan.
- Developed the sample frame used for recruiting.
- Developed study protocols with input from PSD.
- Conducted all analysis and generated all data tables.
- Designed and created the primary building assessment report.
- Provided all reporting, including designing and creating the primary building assessment report and generating this detailed documentation of the methodology.

Under the leadership and guidance of NYSERDA and Cadmus, PSD completed the following tasks:

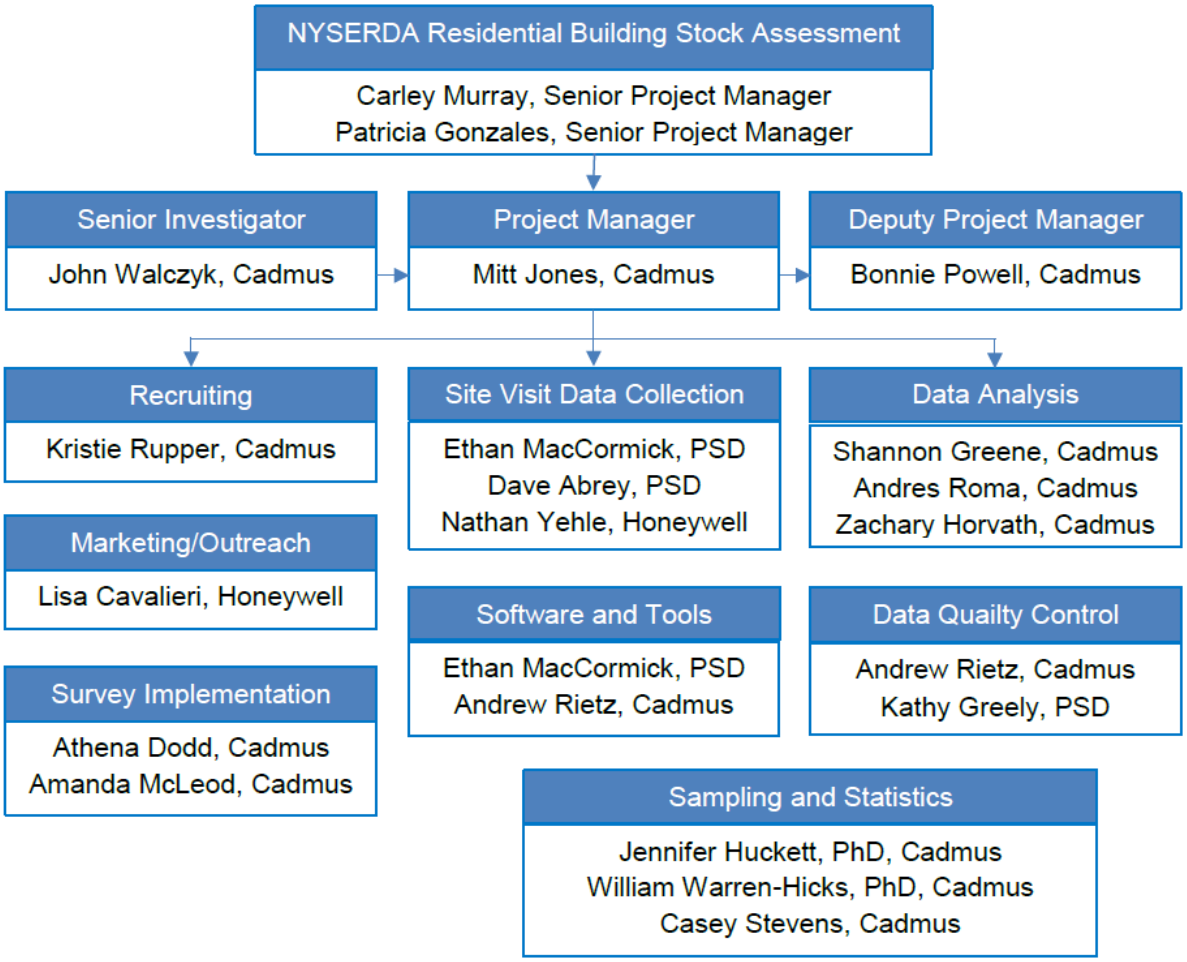
- Updated and deployed the iPad-based data collection tool it provided for the 2015 RSBS, which was used to collect data during site visits.
- Modified its internal scheduling software to accommodate project needs, including providing cloud-based access for Cadmus and Honeywell.
- Conducted project training for PSD and Honeywell field staff.
- Conducted site visits for 95 new homes and 170 of the 361 existing homes in the study.
- Performed initial data cleaning and data quality control (QC) of all site visit data.

Under the leadership and guidance of NYSERDA and Cadmus, Honeywell completed the following tasks:

- Designed the postcard used for recruitment.
- Managed the mailing and printing of postcards to addresses provided by Cadmus and following a timeline determined by NYSERDA and Cadmus.
- Provided phone staff to administer the survey to RBSA postcard recipients who called the toll-free number provided on the postcards.
- Provided phone staff to recruit additional respondents by contacting postcard recipients who had not responded.
- Conducted site visits for 191 of the 361 existing homes in the study.

Figure 2 shows many key members of the building assessment project team at NYSERDA, Cadmus, PSD, and Honeywell. Other project staff at each organization made important contributions such as providing guidance, providing additional project management support, or carrying out essential tasks such as scheduling and completing site visits.

FIGURE 2. BUILDING ASSESSMENT PROJECT TEAM



B.1.4 Overall Approach

As with the 2015 RSBS, providing results representative of homes throughout New York State was a key priority. It was essential to retain the ability to compare results against those of the 2015 RSBS. Finally, to provide results soon enough to meet NYSERDA's required timeline, all data collection had to be complete in fall 2018, less than four months after the project kickoff. These requirements led to three decisions:

- The 2019 RBSA sampled by 10 Economic Development Region (EDRs) to ensure that homes were sampled throughout the State and to provide stratified sampling similar to that of the 2015 RSBS.
- As with the 2015 RSBS, the 2019 RBSA also included separate stratified samples for new and existing homes across the 10 EDRs.
- The 2019 RBSA leveraged data collection methods and tools used in the 2015 RSBS as practical, though the team improved those tools to overcome some previous limitations and to adapt to current trends and priorities.

With the nested design employed by the 2019 RBSA (and the 2015 RSBS before it), the project team first recruited respondents to complete an extensive telephone or online survey, which

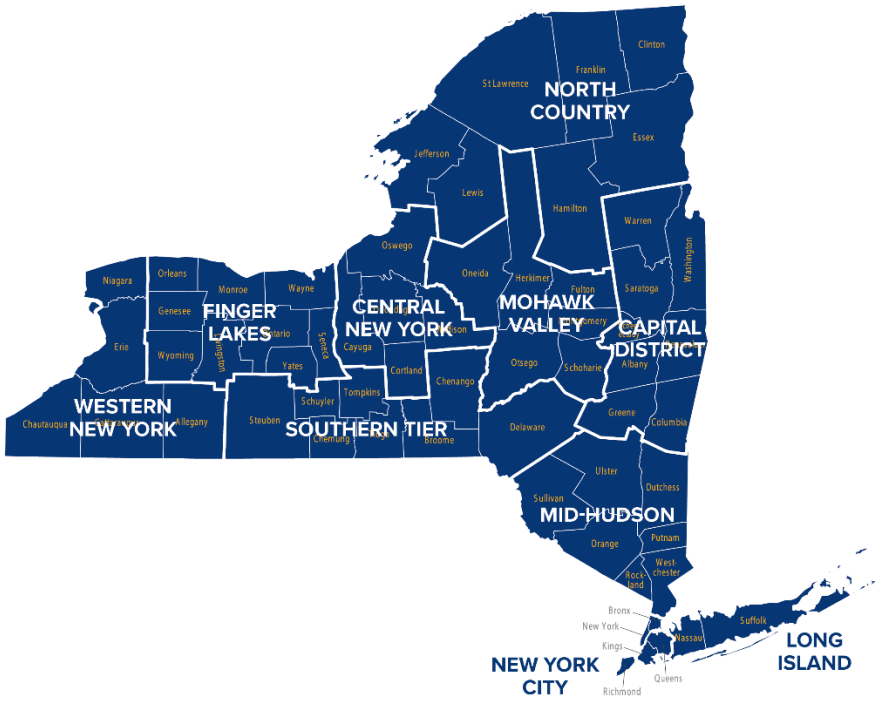
collected a variety of data essential to characterizing single-family homes. The survey also asked respondents whether they would be interested in participating in a site visit. Respondents who agreed to the site visit made up the sample frame for recruiting site visit participants.

B.1.5 Sample Design

Cadmus developed the initial sampling plan during the proposal phase of the project with the goal of achieving 90% confidence and ±10% precision for most parameters of interest statewide and 90% confidence and ±20% precision within each of the 10 EDRs, shown in Figure 3. Based on coefficients of variation for a variety of metrics calculated from the 2015 RSBS data, Cadmus designed a nested approach that called for surveying approximately 2,400 households and visiting 486 homes to collect detailed information from 120 new homes and 366 existing homes.

After project award and further work with the 2015 RSBS data, Cadmus apportioned site visit targets for new and existing homes within each EDR using a combination of EDR population sizes and coefficients of variation calculated from 2015 RSBS data for two key metrics—Home Energy Rating System (HERS) scores for new homes and blower door test results in air changes per hour for existing homes. Cadmus used these metrics because of their importance in characterizing the efficiency of a home and because generating HERS scores and running blower door tests requires a site visit, making these especially good metrics for determining site visit sample sizes. EDRs with the largest populations and greatest variability were assigned a larger proportion of samples, consistent with standard statistical sampling methods.

FIGURE 3. NEW YORK STATE ECONOMIC DEVELOPMENT REGIONS



Cadmus reviewed the resulting sample size distributions and reallocated sample sizes to achieve sufficient coverage in each EDR and to ensure that the 90% confidence and ±20% precision target would be met within each EDR. Table 1 illustrates the target site visit completions for each home vintage within each EDR.

TABLE 1. TARGET SITE VISIT SAMPLE SIZES

Economic Development Region	Existing Homes	New Homes	Total
Capital District	32	16	48
Central New York	57	8	65
Finger Lakes	42	18	60
Long Island	30	10	40
Mid-Hudson	23	18	41
Mohawk Valley	26	5	31
New York City	60	13	73
North Country	20	13	33
Southern Tier	26	5	31
Western New York	50	14	64
Total	**366**	**120**	**486**

B.1.6 Sample Frame

Unlike the 2015 RSBS, the 2019 RBSA did not use customer information provided by investor-owned utilities to recruit for the study, largely because the condensed project timeline did not allow enough time, based on prior experience, to request and receive customer information. Instead, Cadmus constructed the study sample frame by randomly selecting single-family homes from New York State Department of Taxation and Finance tax assessment rolls. To reach postcard recipients who did not respond, Cadmus used a third-party data source, Marketing Systems Groups, to append telephone numbers to homes sampled from tax assessment data. Where necessary, such as for new homes in some EDRs, Cadmus purchased qualified mailing lists from a third party, Dynata (formerly Research Now SSI).

B.1.7 Recruitment Overview

The project team employed a multimode approach to recruiting. This approach used mail, telephone, and email outreach to encourage participation in a phone or online survey, recruiting from a sample of single-family existing and new homes. The survey asked respondents whether they would be interested in participating in a site visit, and those who agreed made up the sample frame for recruiting site visit participants. The project team provided an incentive of $20 to respondents who completed the telephone or online survey and an additional $100 to those who completed a site visit.

This process began by sending postcards (in batches) to a randomly selected set of households, encouraging them to complete the survey using a link to an online version or by calling a field agent using a toll-free number. Approximately 10 days after each mailing, the project team followed up with telephone calls to nonresponders for each record where a telephone number was matched to the sampled address. Additionally, NYSERDA followed up these attempts with an email reminder to a subset of nonresponders where email addresses were available.

As study team members responsible for completing site visits, Honeywell and PSD each handled recruiting and scheduling site visit participants from the group of survey respondents who expressed a willingness to participate. EDRs were divided among the two companies to avoid confusion during recruiting and to allow each company to realize efficiencies by focusing on a smaller geographic area.

B.1.8 Summary of Data Collection Activities

The 2019 RBSA sample design and recruitment led to completion of 2,419 surveys (2,223 online and 196 phone) between September 28, 2018, and December 3, 2018, as shown in Table 2. The project team completed 456 site visits between October 10 and December 15, 2018.

TABLE 2. SITE VISITS AND SURVEY COMPLETIONS BY HOME VINTAGE

Respondent Type	Target Survey Completions	Survey Completions	Target Site Visit Completions	Site Visit Completions
Existing Homes	1,825	1,835	366	361
New Homes	598	584	120	95
Total	**2,423**	**2,419**	**486**	**456**

Table 3 shows survey completions and site visits by EDR.

TABLE 3. SURVEY COMPLETIONS AND SITE VISITS BY ECONOMIC DEVELOPMENT REGION

Economic Development Region	Survey Completions	Target Site Visits Completions	Site Visits Completions
Capital District	258	48	48
Central New York	304	65	64
Finger Lakes	289	60	62
Long Island	243	40	33
Mid-Hudson	194	41	41
Mohawk Valley	142	31	32
New York City	287	73	55
North Country	148	33	29
Southern Tier	205	31	28
Western New York	349	64	64
Total	**2,419**	**486**	**456**

B.1.9 Climate Zones

The 62 counties within the State vary in climate from Climate Zone 4 to Climate Zone 6, as shown in Figure 4 and as defined in the 2009 and 2015 International Energy Conservation Code. Consistent with the 2015 RSBS, for the purpose of analyzing and presenting results, the 2019 RBSA project team grouped survey and site visit participants into the three climate zones by county, as shown in Figure 5.

FIGURE 4. NEW YORK STATE CLIMATE ZONE MAP

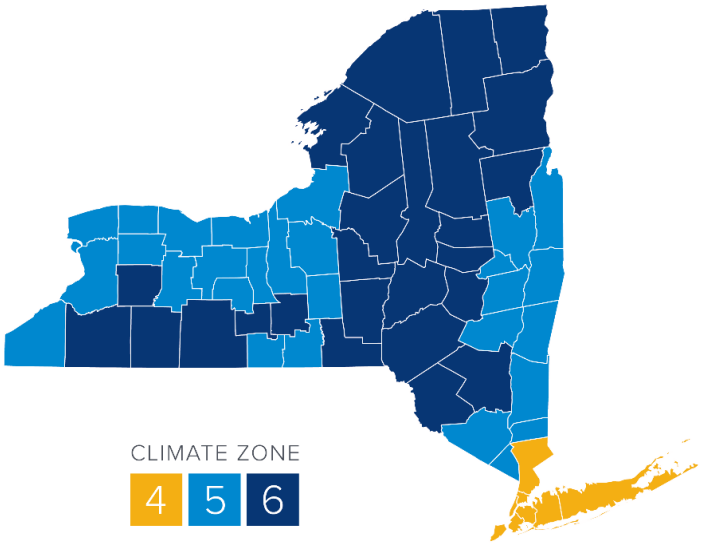


FIGURE 5. NEW YORK STATE CLIMATE ZONE BY COUNTY

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	Oswego	Seneca
Chemung	Livingston	Orleans	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	

Table 4 shows survey and site visit completions by climate zone for new and existing homes.

TABLE 4. SURVEY AND SITE VISIT COMPLETIONS BY HOME VINTAGE AND CLIMATE ZONE

Climate Zone	Survey Completions		Site Visit Completions	
	Existing Homes	New Homes	Existing Homes	New Homes
Climate Zone 4	515	38	85	5
Climate Zone 5	913	420	206	68
Climate Zone 6	407	126	70	22
Total	**1,835**	**584**	**361**	**95**

B.1.10 Weights

The basic function of a weight is to estimate the number of homes each home represents. If 50 out of 1,000 homes are sampled in a given stratum, the resulting weight would be 20 (Population (N)/sample size (n)). For example, if a single ground-source heat pump is observed in one home (which represents 20 homes), you can estimate that 20 homes in the population have a ground-source heat pump. If you observe an average of eight LEDs in each home, you can estimate that the population of 1,000 homes includes 8,000 LEDs (50 homes * 8 bulbs * 20 weight, or 8 bulbs * 1,000 homes).

For the 2019 RBSA, stratifying by climate zone within each home vintage—new and existing—results in six distinct strata:

- Climate Zone 4 Existing Homes.
- Climate Zone 5 Existing Homes.
- Climate Zone 6 Existing Homes.
- Climate Zone 4 New Homes.
- Climate Zone 5 New Homes.
- Climate Zone 6 New Homes.

The study assumed that the random sampling within each EDR resulted in representative samples of the populations in each of these six strata. Accordingly, when characterizing specific parameters within each stratum, applying sampling weights to the results is unnecessary.

When calculating totals, means, proportions, or other summary statistics for a population that encompasses more than one of the six strata, a sample weight must be applied to each observation to give it the appropriate contribution for the population. Cadmus calculated a weight for each of the six strata and for each primary data collection method—survey and site visit—by dividing the estimated population of single-family homes in that stratum by the achieved sample size in that stratum.

The analysis for a given characteristic often involved recalculating stratum weights to account for a smaller sample size, because in many cases values for a given characteristic were not known for some of the sampled homes. The project team calculated a new weight for each stratum as the stratum population (which was always the same for that stratum) divided by the number of homes in the sample with observed values. Cadmus recalculated weights only when the subset of homes with observed values were meant to be representative of the population of

that stratum. Site weights that assume a full sample size for each stratum are provided for each observation in the 2019 RBSA survey and site visit datasets.

Cadmus used 2016 American Community Survey (ACS) *5-Year Estimates* to estimate the total population of homes in each climate zone and used "Building Permits Survey" data from census.gov to estimate new homes populations. Cadmus subtracted the new homes population from the total population to arrive at estimates for existing homes. Table 5 shows the population estimates used in the weighting calculations for survey and site visit observations. The *B.2 Web and Telephone Survey* and *B.3 Site Visits* sections provide tables with the survey weights for observations in both data collection methods.

TABLE 5. 2019 RESIDENTIAL BUILDING STOCK ASSESSMENT POPULATION ESTIMATES

Climate Zone	Population	
	Existing Homes	New Homes
Climate Zone 4	2,516,613	12,105
Climate Zone 5	1,945,375	18,451
Climate Zone 6	807,178	7,169
Total	**5,269,166**	**37,725**

B.1.11 Estimation Methods

Cadmus used SAS statistical software to calculate weighted mean and proportion tables presented in Appendix A. For tables presenting proportions and distributions, Cadmus used the SAS procedure PROC SURVEYFREQ. For tables presenting means, Cadmus used the SAS procedure PROC SURVEYMEANS. Inputs to these procedures are outlined in Table 6.

TABLE 6. SAS PROCEDURES USED IN RESIDENTIAL BUILDING STOCK ASSESSMENT ANALYSIS

Procedure	Statement	Input
PROC SURVEYFREQ[a]	TABLE	Grouping variables used in the rows and columns for the tables. These could include either a stratification variable or any variable used to report results.
	WEIGHT	If reporting whole-home results, WEIGHT is specified as the case weight. If reporting component-level results, WEIGHT is specified as the case weight multiplied by the number of components within the home.
PROC SURVEYMEANS[b]	VAR	Grouping variable used in the rows for the tables. This could include either a stratification variable or any variable used to report results.
	STRATA	Grouping variable used in the columns for the tables. This could be a stratification variable or any variable used to report results.
	BY	Grouping variable used in the columns for the tables, such as home vintage or climate zone. Using the BY statement provides completely separate analyses of the BY groups for each column.
	WEIGHT	If reporting whole-home results, WEIGHT is specified as the case weight. If reporting component-level results, WEIGHT is specified as the case weight multiplied by the number of components within the home.

[a] *https://support.sas.com/documentation/cdl/en/statug/63347/HTML/default/viewer.htm#statug_surveyfreq_sect003.htm*
[b] *https://support.sas.com/documentation/cdl/en/statug/63033/HTML/default/viewer.htm#statug_surveymeans_sect006.htm*

Estimates and standard errors produced using the methods outlined above are weighted estimates using stratified estimation methods and are representative of what is expected in the population based on the sample. To understand the methodology of the SAS procedures used in this analysis, or to perform this analysis with a different program, please see *the B.1.11.1 Formulas* section below.

B.1.11.1 Formulas

Formulas in this section allow estimation of whole-home metrics. If estimating at a component level, replace the population of homes (N) and sample size of homes (n) with the estimated population of components ($\widehat{M}$) and number of sampled components (m). The formulas in this section use the notations provided in Table 7 for stratified estimation.

TABLE 7. NOTATION FOR STRATIFIED ESTIMATION

Symbol	Description
Y, y	Observation within population (upper case) or sample (lower case)
i	Home identifier
l	Stratum defined by a unique combination of climate zone and building type
N, n	Population of homes (upper case) and sample size (lower case) of homes
$\widehat{M}, m$	Estimated population of components (upper case) and sample size of components (lower case), where $\widehat{M} = N * m$

Note that all estimates are parameter-level metrics but will use building-level population stratified estimation formulas. The population sizes, Nl, correspond to building population sizes in each of the six strata.

B.1.11.1.1 Estimation within a Single Stratum

Calculating means or proportions within a single stratum, such as for one climate zone and home vintage, does not require stratification weighting. Use the formulas for mean and proportion estimates in Equation 1 through Equation 4. *These equations should be used only within a single stratum and, in most cases for the NYSERDA RBSA, Equation 5 through Equation 8 will also be necessary when conducting the analysis on a given characteristic.*

Equation 1: Means

Means should be calculated using Equation 1, where y_{il} represents the observed metric for home *i* in stratum *l*, n_l represents the number of instances in the sample in stratum *l* with that metric observed, and $\bar{y}_l$ represents the estimated mean of the observed metric in stratum *l*.

$$\bar{y}_l = \frac{1}{n_l} \sum_{i=1}^{n_l} y_{il}$$

Equation 2: Stand Errors of Estimated Means

Standard errors of the estimated means should be calculated using Equation 2, where the y_{il} and n_l are the same as in Equation 1, N_l represents the population size of homes in stratum *l*, and $SE(\overline{yl})$ represents the standard error of the estimated mean in stratum *l*. Again, this equation is valid only for results within a given stratum and additional equations will be needed when results span two or more strata.

$$SE(\bar{y}_l) = \sqrt{\left(1 - \frac{n_l}{N_l}\right)\left(\frac{1}{n_l}\right)\left(\frac{1}{n_l - 1}\sum_{i=1}^{n_l}(y_{il} - \bar{y}_l)^2\right)}$$

Equation 3: Proportions

Proportions should be calculated using Equation 3, where n_{l^*} represents the number of observations with the characteristic of interest (for example, homes of a certain height) and n_l represents the number of homes in the sample in stratum *l* with a known value for that characteristic. For example, to estimate the proportion of doors within each weatherstripping category, calculate n_{l^*} by counting the number of doors in stratum *l* with known values, such as good, fair, poor, or none, then divide each n_{l^*} by n_l, the total number of doors with weatherstripping observed in the stratum. The result will be one $\hat{p}_l$ value for each characteristic (good, fair, poor, and none).

$$\hat{p}_l = \frac{n_l^*}{n_l}$$

Equation 4: Standard Errors of Estimated Proportions

Standard errors of estimated proportions should be calculated using Equation 4, where nl is the same as above and Nl represents the population size of observations in stratum *l*. The estimate from Equation 3 results in $\hat{p}l$, and $SE(\hat{p}l)$ represents the standard error of the estimated proportion in stratum *l*.

$$SE(\hat{p}_l) = \sqrt{\left(1 - \frac{n_l}{N_l}\right)\frac{\hat{p}_l(1 - \hat{p}_l)}{n_l}}$$

B.1.11.1.2 Stratified Estimation: Combining Multiple Strata

Estimating means or proportions for populations that include multiple combined strata requires stratification weighting. Equation 5 through Equation 8 should be used to estimate values that represent more than one stratum, such as statewide values and values that represent all homes (new and existing) within each climate zone. These build on Equation 1 through Equation 4 above.

Equation 5: Combined Means

Means should be calculated using Equation 5, where $\bar{y}_l$ is the mean within stratum *l* and N_l is the population size of homes in stratum *l*. The products of the population sizes and mean estimates should be summed, then divided by the sum of the population sizes. In the summation notation, *L* represents the total number of strata. The result is a combined mean estimate, $\bar{y}$. For example, to estimate the mean conditioned floor area for the State, the user should assign *l*=1 to 6 to represent the six strata defined for the study. The user should sum the population sizes from the six strata to calculate the denominator in Equation 5 and divide the sum of the product of each stratum population size Nl with the stratum mean estimate $\bar{y}l$ by the summed population sizes.

$$\bar{y} = \frac{\sum_{l=1}^{L} N_l * \bar{y}_l}{\sum_{l=1}^{L} N_l}$$

Equation 6: Standard Errors of Estimated Means

Standard errors of estimated means should be calculated using Equation 6 with the standard error of the estimated mean in each stratum *l*, $SE(\bar{y}_l)$, defined above in Equation 2. The products of the squared population sizes, N_l, should be summed with the squared mean standard errors, $SE(\bar{y}_l)$, then the square root of the sum should be divided by the sum of the population sizes.

$$SE(\bar{y}) = \frac{1}{\sum_{l=1}^{L} N_l} \sqrt{\sum_{l=1}^{L} N_l^2 * SE(\bar{y}_l)^2}$$

Equation 7: Proportions

Proportions should be calculated using Equation 7, where $\hat{p}_l$ represents the proportion in each stratum *l* and is defined above in Equation 3. The population size, N_l, represents the number of homes in each stratum *l*. Similar to the combined mean estimate, the product of the population sizes and the strata proportions should be summed, then divided by the sum of the strata population sizes.

$$\hat{p} = \frac{\sum_{l=1}^{L} N_l * \hat{p}_l}{\sum_{l=1}^{L} N_l}$$

Equation 8: Standard Errors of Combined Proportion Estimates

Standard errors of the combined proportion estimates should be calculated using Equation 8, with the standard error of the estimated proportion in each stratum, $\hat{p}_l$, calculated using Equation 4 and the strata population sizes N_l. The product of the squared population sizes, N_l, and squared standard errors, $SE(\hat{p}l)$, should be summed in each stratum, then square root of the sum should be divided by the sum of the population sizes.

$$SE(\hat{p}) = \sqrt{\frac{\sum_{l=1}^{L} N_l^2 * SE(\hat{p}_l)^2}{\sum_{l=1}^{L} N_l}}$$

B.1.12 Comparisons of Weighted Data to Other Data Sources

Cadmus compared weighted results from survey and site visit data to numerous sources, including the following:

- 2013-2017 ACS *5-Year Estimates*.
- 2016 U.S. Energy Information Administration *Electric Sales, Revenue, and Average Price*, Table 5.a.
- U.S. Energy Information Administration *2009 Residential Energy Consumption Survey.*
- D&R International and the Heating Air-Conditioning & Refrigeration Distributors International data for 2017.

Table 8 shows a comparison of weighted 2019 RBSA statewide results for several key characteristics. Most of the values in the Other State Data Sources column are available only for single-family and multifamily homes combined, making direct comparisons between the 2015 RSBS and 2019 RBSA study results difficult. In addition, the annual energy consumption results for the 2019 RBSA are not directly comparable with those shown for the 2015 RSBS, because the 2019 estimates are based on data taken from bills during site visits; in contrast, the 2015 RSBS results were calculated for survey respondents' using billing data provided by utilities, which was not practical for the 2019 RBSA given its accelerated timeline.

While Table 8 shows statistically significant differences between the 2019 RBSA and 2015 RSBS studies for several characteristics, values for key parameters such as home size, annual energy consumption, and number of occupants speak well for the representativeness of the sample. As noted in Volume 5 of the 2015 RSBS report, most metrics that may indicate bias in the sample, such as high educational attainment and relatively high income, apply to the home occupants rather than to the home itself, which was the sampling unit for the study. In addition, it is possible that survey respondents may exaggerate their household income and educational attainment.

As noted in reporting for the 2015 RSBS, some of the observed differences in demographic data between the current study and benchmark sources, such as the differences in education, could be explained by differences in methodology. The 2019 RBSA estimates that 39% of households or building units have at least one household member with a graduate degree. In comparison, about 15.4% of respondents to the ACS reported that they have a graduate degree. Note that the 2019 RBSA survey collected the highest level of educational attainment for *anyone* in household, which may have been interpreted to include grown children who had moved away, while the ACS collected the highest level of education of only the *respondent*.

TABLE 8. TYPICAL SINGLE-FAMILY EXISTING HOMES PROFILE

Characteristic	2015 RSBS Statewide	2019 RBSA Statewide	Other State Data Sources (Single-Family and Multifamily)
Home age—built in 1939 or earlier[a]	28.0%	25.2%	32.3%[b]
Home square footage less than 2,000[a]	65.3%	58.6%▼	1,832 sq ft average[c]
Average number of bedrooms[a]	3.1	3.4▲	31.7% three bedrooms[b]
Most common house type—single-family detached house[a]	71.7%	87.7%▲	65%[b]
Annual energy consumption between 6,000 kWh and 12,000 kWh[d]	40.4%	50.5%▲	6,864 kWh average[e]
Occupancy—own/buying[a]	81.2%	97.4%▲	54% owner-occupied[b]
Average number of occupants[a]	2.8	2.8	2.6[b]
Annual household income of $75,000 or more[a]	46.0%	52.9%▲	43%[b]
Highest education level in household of graduate degree[a]	33.9%	39.5%▲	15.4% of respondents age 25 and over[b]

[a] From survey data.
[b] From 2013-2017 ACS *5-Year Estimates*;
[c] From U.S. Energy Information Administration *2009 Residential Energy Consumption Survey*.
[d] From site visit data.
[e] From U.S. Energy Information Administration 2016 *Electric Sales, Revenue, and Average Price.*

Table 9 shows a comparison of the new home samples for the 2019 RBSA and 2015 RSBS. With the 2019 RBSA, a smaller percentage of homes appear to have less than 2,000 square feet of living space, reported household income is better aligned with that of existing homes than with the 2015 RSBS sample, and a significantly lower percentage of homes are single-family detached houses.

TABLE 9. TYPICAL SINGLE-FAMILY NEW HOMES PROFILE

Characteristic	2015 RSBS Statewide	2019 RBSA Statewide
Average HERS rating[a]	68.5	55.7▼
Home age—built in 2015 or after[b]	67.0%	33.8%▼
Home square footage less than 2,000[b]	36.8%	44.9%▲
Average number of bedrooms[b]	3.3	3.4
Annual energy consumption between 5,470 kWh and 8,202 kWh[a]	29.2%	22.0%
Most common home type—single family detached house[b]	93.6%	83.8%▼
Occupancy—own/buying[b]	99.7%	98.8%
Annual household income of $75,000 or more[b]	75.6%	56.5%▼
Average number of occupants[b]	2.9	3.1
Highest education level in household of graduate degree[b]	44.2%	48.0%

[a] From site visit data.
[b] From survey data.

B.1.13 Statistical Confidence, Precision, and Error Bounds

As mentioned in the *B.1.5 Sample Design* section above, Cadmus developed a sampling plan with the goal of achieving 90% confidence and ±10% precision for most parameters of interest statewide. Precision represents uncertainty with a level of confidence. When the study achieves ±10% precision at the 90% confidence level, one can be 90% confident that any random sample of the same population would yield a result within ±10% of the study's result.

Data tables provided in Appendix A include error bounds for all values. Cadmus calculated the error bounds as the standard error multiplied by a t-statistic, and they provide the half-width of the 90% confidence interval. Error bounds are equivalent to absolute precision and have the same units as the estimate. When reporting precision, absolute precision is typically reported for percentages or distributions, while relative precision is typically reported for means or totals. To calculate the relative precision for a given mean or total, divide the error bound by the associated estimate. With percentages, the reported error bound represents the absolute precision.

With a total sample size of 2,419 across the six strata, the precision for survey results easily falls within the target 90/10 for the State and for each stratum except Climate Zone 4 new homes. Even with that stratum, however, the survey sample size of 38 often delivers results within the 90/10 target given the relatively small coefficients of variation for many characteristics in new homes.

Site visit results for key metrics easily fall within the 90/10 target at the statewide level, with a total sample size of 456 sites, and often meet 90/10 within climate zones. For one key metric mentioned above in the *B.1.5 Sample Design* section, average air leakage expressed in air changes per hour (ACH50), analysis showed a relative precision of ±7% statewide at the 90% confidence level, ±13% for Climate Zone 4, ±8% for Climate Zone 5, and ±17% for Climate Zone 6. That said, it is worth keeping in mind that air leakage rates in existing homes are highly variable, making it difficult to obtain good precision for this variable.

With a site visit sample size of only five, results for the Climate Zone 4 new homes stratum generally yield poor precision and should not be considered representative due to the small sample size.

B.2 WEB AND TELEPHONE SURVEY

B.2.1 Summary of Approach

The RBSA web and phone survey collected data from September 28, 2018, through December 3, 2018, and allowed participation by telephone or web. Using input from NYSERDA's evaluation and program staff, Cadmus designed the survey to closely align with the 2015 RSBS baseline survey to ensure that results could be compared. The survey and survey programming were reviewed and approved by NYSERDA prior to the launch.

Additional questions for the 2019 RBSA collected information about several factors:

- Connected devices.
- Smart thermostats.
- Number of ductless mini-split heat pumps installed.
- Supplemental heating systems.
- Willingness to pay at various levels for high-efficiency equipment.
- Utility bill payment and assistance.

The key objectives of the survey were to provide up-to-date, self-reported estimates of equipment types, fuel types and uses, vintages, and efficiencies, as well as information about building characteristics, demographics, homeowner energy consumption attitudes and behaviors, participation in energy efficiency programs, and willingness to pay for different types of efficient equipment. Additionally, the survey was used to recruit households for site visits.

Honeywell conducted the telephone surveys. Phone staff made multiple attempts to reach potential respondents on different days of the week and different times of the day.

The project team offered survey respondents the option to receive a $20 Amazon gift card electronically through email or as a physical gift card mailed to them for their participation in the survey. If requested, the survey respondents were provided with an optional pre-paid Visa card. The project team distributed gift cards on a weekly basis.

B.2.2 Sampling

To identify recipients for RBSA recruiting postcards, Cadmus began by drawing a random sample of single-family households from the 2015 to 2017 New York State Department of Taxation and Finance tax assessment rolls within each EDR. The tax assessment rolls did not include phone numbers or email records. Cadmus matched phone numbers for 85% of the sampled records using a third-party data source, Marketing Systems Groups, to allow outreach to nonresponders by phone.

The tax assessment rolls included ample homes for the existing homes sample (homes built before 2015) for most EDRs but provided too few new homes records to adequately support recruiting for new homes. In addition, the tax assessment roll data included no homes in the New York City EDR and several counties elsewhere in the State. The data included very few new homes in Long Island. After consultation with NYSERDA, Cadmus purchased address lists

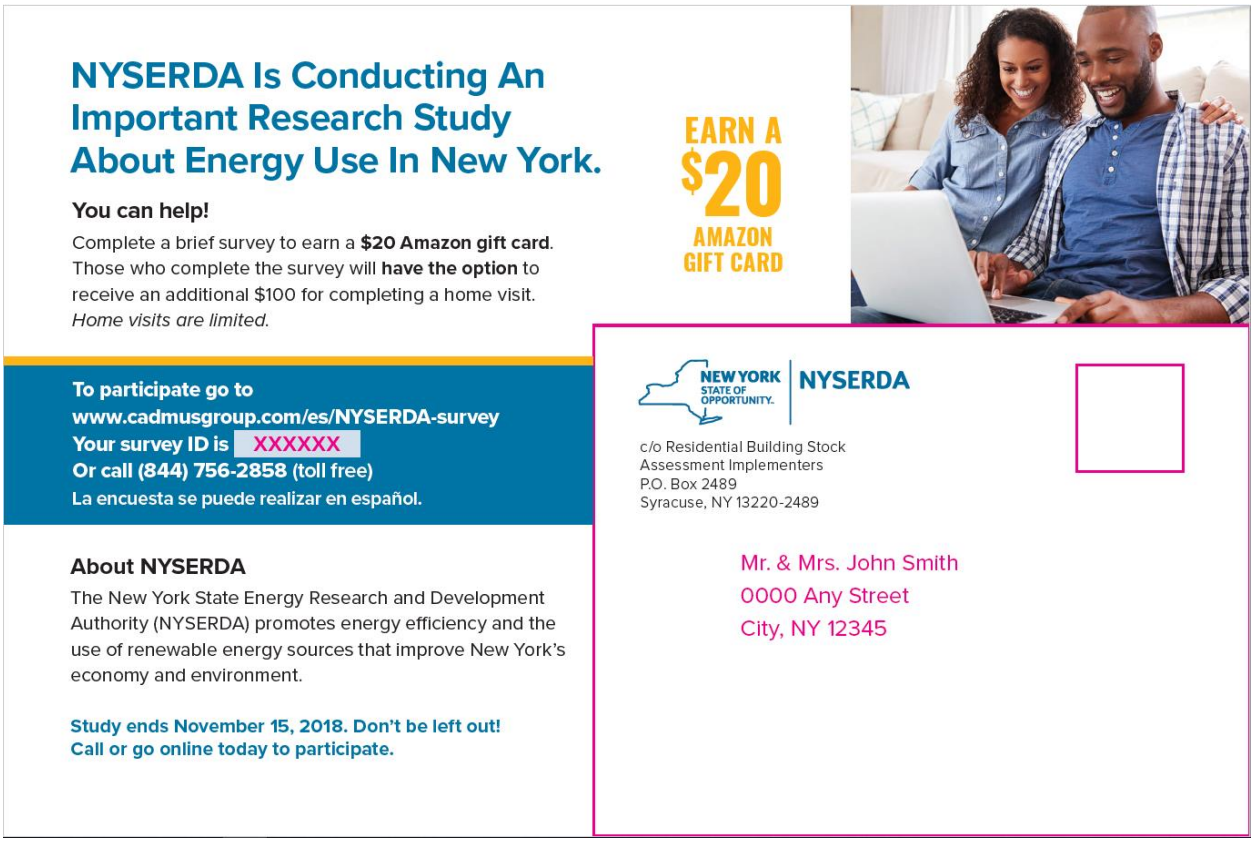
for New York City, new homes, and other segments as needed from a third-party data source, Dynata. Forty-four percent of purchased new homes records included a phone number.

B.2.3 Response Rates

To recruit survey recipients, the project team mailed postcards to randomly selected homes within each EDR in sufficient numbers to reach the site visit goals, where practical. Designed by Honeywell under the direction of NYSERDA and Cadmus, the postcards (see Figure 6 and Figure 7) invited recipients to complete the survey online or by phone and provided a toll-free number. The postcards noted that the survey was offered in Spanish, and Honeywell provided phone staff to conduct surveys in English or Spanish at a toll-free number. Honeywell phone staff also attempted to contact postcard recipients by phone who had not responded.

FIGURE 6. EXAMPLE OF RECRUITING POSTCARD, FRONT

FIGURE 7. EXAMPLE OF RECRUITING POSTCARD, BACK



Like the 2015 RSBS, the 2019 RBSA offered a $20 gift card to respondents who completed the survey, along with an additional $100 gift card to those who went on to complete a site visit. As a default, Cadmus provided an electronic Amazon gift card, which was delivered by email. Alternatively, physical Visa and Amazon gift cards were available on request.

Cadmus built its initial recruiting plan around the 13.6% response rate reported for the previous study. In practice, given the recruiting methodology available during the short timeline and the timing of the November 2018 elections, the actual response rate proved much lower. The project team mailed postcards in successive batches, adjusting the timing, targeted EDRs, and quantities as necessary, with the goal of meeting site visit targets while also minimizing cost. Overall, the project team mailed 138,281 postcards (in addition to sending an email blast to 3,994 recipients) and achieved a response rate of 2%, as shown in Table 10.

Table 10 also shows disposition and response rate by EDR, which ranged from 1% for New York City and Long Island to 3% for Capital District, Finger Lakes, and North Country. Despite rigorous call attempts to postcard recipients who had not responded, an unexpectedly small number of survey respondents—196 of 2,419—opted to complete the survey by phone.

TABLE 10. WEB AND TELEPHONE SURVEY DISPOSITION AND RESPONSE RATE BY ECONOMIC DEVELOPMENT REGION

Disposition	Capital District	Central New York	Finger Lakes	Mid-Hudson	Long Island	Mohawk Valley	New York City	North Country	Southern Tier	Western New York	Total
Total sampled (mailed)	7,791	17,322	10,635	10,720	23,850	7,215	29,085	5,529	8,395	17,739	138,281
Completed by phone	17	26	6	11	22	16	44	10	17	27	196
Completed via web	241	278	283	183	221	126	243	138	188	322	2,223
Partially completed	16	26	16	12	27	9	26	7	8	30	177
Active sample (received postcard but did not begin survey)	6,849	16,179	9,960	10,155	23,107	6,794	27,832	5,174	7,891	16,904	130,845
Refused to complete	165	173	112	85	106	58	171	55	58	95	1,078
Invalid phone number (disconnected)	482	609	231	224	330	192	656	115	211	325	3,375
Business line (wrong number)	1	0	1	0	16	0	0	0	0	0	18
Language barrier	1	0	0	2	0	6	0	18	1	0	28
Ineligible - wrong address	3	10	7	5	3	7	9	5	12	11	72
Ineligible - invalid utility	0	0	0	0	0	1	0	0	0	0	1
Ineligible - do not occupy home	1	7	10	5	5	2	7	4	2	7	50
Ineligible - invalid housing type	12	12	8	31	10	4	64	3	7	16	167
Ineligible - invalid number of units	3	2	1	7	3	0	33	0	0	2	51
Response rate[a]	**3%**	**2%**	**3%**	**2%**	**1%**	**2%**	**1%**	**3%**	**2%**	**2%**	**2%**
Cooperation rate[b]	**4%**	**2%**	**3%**	**2%**	**1%**	**2%**	**1%**	**3%**	**3%**	**2%**	**2%**

[a] The response rate was calculated as the number of completed telephone and web surveys divided by the total sampled.
[b] The cooperation rate was calculated as the number of completed telephone and web surveys divided by the total sampled minus invalid phone numbers, business lines, language barriers, and ineligible cases.

B.2.4 Data Cleaning

Cadmus performed mostly minimal cleaning of the survey data, largely in the spirit of preserving participant responses, but did make two substantive changes to the survey data.

- Consistent with the 2015 RSBS, the 2019 RBSA survey included "baseboard heat" as an option for the primary heating system, without specifying what type of baseboard heat. Cadmus noted that 200 survey respondents identified their primary heating fuel as something other than electricity and identified their primary heating type as baseboard heat. Cadmus changed the primary heating system for these respondents to "Steam/hot water system with radiators or pipes in each room (central boiler)."
- An unrealistically large number of survey respondents—340—identified their water heating equipment as a heat pump water heater. Roughly 60% of these identified their water heating fuel as natural gas or another fossil fuel rather than electricity. For the 61 sites that were also included in the site visit sample, site visit data showed that only eight had heat pump water heaters, and roughly 80% of the 61 had correctly identified their water heating fuel type. After consultation with NYSERDA, Cadmus changed water heater type to "Don't know" for 208 survey respondents who identified their water heater as a heat pump water heater but identified their water heater fuel as something other than electricity.

Data cleaning and QC entailed making the styling, capitalization, and spelling of entered values (such as utility names) consistent and categorizing "Other" responses within predefined categories as appropriate.

B.2.5 Stratification Weights

When calculating totals, means, proportions, or other summary statistics for a population that encompasses more than one of the six strata, a sample weight must be applied to each observation to give it the appropriate contribution for the population. Cadmus calculated a weight for each of the six strata by dividing the estimated population of single-family homes in that stratum by the achieved sample size. Table 11 shows the population, survey completion, and calculated survey weight for each of the six strata.

TABLE 11. SURVEY STRATIFICATION WEIGHTS

Climate Zone	Population		Survey Completions		Survey Weights	
	Existing Homes	New Homes	Existing Homes	New Homes	Existing Homes	New Homes
Climate Zone 4	2,516,613	12,105	515	38	4,886.63	318.55
Climate Zone 5	1,945,375	18,451	913	420	2,130.75	43.93
Climate Zone 6	807,178	7,169	407	126	1,983.24	56.90
Total	**5,269,166**	**37,725**	**1,835**	**584**	**N/A**	**N/A**

B.2.6 Limitations and Suggestions for Future Studies

The 2019 RBSA survey was an overall success, providing important and useful data for 2,419 respondents throughout the State and creating ample recruits for site visits in most strata. This section highlights the methodologies and choices that worked especially well and then describes challenges and limitations to consider for any future iterations of the project.

Several aspects of the 2019 RBSA survey methodology and process worked well:

- Sampling and recruiting by EDR ensured that the sample included homes throughout the State and provided a convenient geographic structure for organizing and assigning site visits.
- The electronic Amazon gift cards were well-received by most recipients and providing the gift cards to recipients was a relatively easy task to manage. Some people preferred physical gift cards, which increased expense and logistical overhead somewhat.
- Having the 2015 RSBS survey instrument as a starting point was essential to the project team's ability to deploy the 2019 RBSA survey within the allowed timeframe.

The following items summarize limitations of the methodology and data and provide a few suggestions for future iterations of the project:

- The recruiting approach (using utility customer data) for the 2015 RSBS resulted in an impressive response rate of 13.6% and should be used in future efforts if the project timeline will allow. Providing a lengthy enough timeline to allow the sample to be drawn from utility customer data appears to be key, at least partly because it may allow the study to receive accurate names, telephone numbers, and possibly even email addresses. Being able to recruit through mail, telephone calls, and particularly email would help to reduce the cost of contacting potential respondents and help to achieve the most representative sample practical.
- Survey recruiting succeeded in achieving more than adequate survey sample sizes for most strata, but new home survey completes were not high enough for either Climate Zone 4 or Climate Zone 6 to support meeting site visit goals in those climate zones.
- The comparatively small number of new homes in the State makes meeting new homes quotas especially difficult. If characterizing new homes remains a high priority, special care should be taken to construct a new homes sample from all available sources, focusing especially on EDRs in Climate Zone 4 and Climate Zone 6. These sources should include tax assessment data, purchased sample, and possibly even address lists from high-volume builders. Social media may also prove useful. This approach should be combined with a more deliberate recruiting methodology, such as the one used for the 2015 RSBS, to get the most responses from this typically small population of homes.
- Despite thorough investigation of the tax assessment roll data, Cadmus was able to identify only a small number of quadplexes, and these homes may have been underrepresented in the data.
- Survey length likely contributed to the low response rate for the 2019 RBSA. The survey used the 2015 RSBS survey script as a starting point, but numerous questions were added to investigate respondents' willingness to pay for different types of energy efficiency improvements and to collect data on additional types of equipment, such as connected devices and smart thermostats. After removing surveys that took longer than two hours, the average survey length was 38 minutes (n=2,216); after removing surveys that took longer than one hour, the average survey length was 33 minutes (n=1,980).
- The fall 2018 elections likely had a significant effect on both overall response rate and the ability of Honeywell phone staff to reach potential respondents by phone. Election-related postcards and letters made it less likely that RBSA postcards would be noticed, and the high volume of robocalls during that period may have caused many potential respondents to avoid answering the phone. Response rates may be higher in the future if the study can be timed to avoid competing with election-related marketing.
- NYSERDA is moving away from offering financial incentives. To allow for a sampling and recruiting approach that eliminates financial incentives, NYSERDA may want to

consider alternative forms of incentives, such as energy saver kits or home energy reports. The challenge will be to find an alternative to financial incentives that works but does not bias the sample more toward those who most value energy efficiency. Cadmus' experience is that financial incentives are critical to securing homeowner participation in surveys and site visits, and the project team recommends that any alternative approach be tested with surveys only and well in advance of the start of site visits.

- In isolated cases, survey response options (such as for baseboard heat) failed to adequately distinguish between the relevant technologies or choices. Should the study be replicated, the next project team should continue to improve the survey instrument.
- Some survey questions appear to require more knowledge about a given topic than many respondents possess, as evidenced by the 340 respondents mentioned above who reported having a heat pump water heater. While surveys excel at collecting many data points accurately and economically, this example underscores the value of and need to continue having site visits in future updates to the study. Being able to compare data from the two sources—sometimes for the same homes—allows confirmation that results are solid and helps identify cases where one data collection method may not be delivering an accurate result.

B.3 SITE VISITS

B.3.1 Summary of Approach

The project team conducted all site visits between October 10, 2018, and December 15, 2018, after a two-day in-person training for Honeywell and PSD project field staff. Under the direction of NYSERDA and Cadmus, PSD completed all new homes site visits through contracted HERS Raters. PSD also completed 170 existing homes site visits, while Honeywell staff completed 191 existing home site visits. All existing homes site visits were completed by HERS Raters or professionals holding Building Performance Institute (BPI) credentials.

For the RBSA survey, site visit data collection generally followed 2015 RSBS data scope and methods, including generating a HERS score for each new home and running blower door tests on all homes where allowed under Residential Energy Services Network (RESNET) and BPI standards. New data collected for the 2019 RBSA included several measures:

- Connected devices.
- Smart thermostats.
- LED bulbs.
- Extensive information about heat pump systems.

B.3.2 Sampling and Recruitment

As study team members responsible for completing site visits, Honeywell and PSD handled recruiting and scheduling of site visit participants from the group of survey respondents who expressed a willingness to participate. EDRs were divided between the two companies to avoid confusion during recruiting and to allow each company to realize efficiencies by focusing on a smaller geographic area. The project team provided site visit participants with an additional $100 gift card. Table 12 shows site visit completions by EDR and home vintage.

TABLE 12. SITE VISIT COMPLETIONS BY ECONOMIC DEVELOPMENT REGION AND HOME VINTAGE

Economic Development Region	Existing Homes	New Homes	Total
Capital District	32	16	48
Central New York	57	7	64
Finger Lakes	44	18	62
Long Island	30	3	33
Mid-Hudson	23	18	41
Mohawk Valley	27	5	32
New York City	53	2	55
North Country	19	10	29
Southern Tier	26	2	28
Western New York	50	14	64
Total	**361**	**95**	**456**

B.3.3 Response Rates

The percentage of survey respondents willing to schedule a site visit was relatively high, at 18.9%, as shown in Table 13. On the other hand, the site visit response rate calculated as a percentage of mailed postcards was below 1% for every EDR and was 0.3% overall. Recruiting proved most difficult in Long Island, where the site visit response rate from postcards was a mere 0.1%.

TABLE 13. SITE VISIT RESPONSE RATES BY ECONOMIC DEVELOPMENT REGION

Economic Development Region	Postcards	Surveys	Site Visits	Response Rate from Surveys	Response Rate from Postcards
Capital District	7,791	258	48	18.6%	0.6%
Central New York	17,322	304	64	21.1%	0.4%
Finger Lakes	10,635	289	62	21.5%	0.6%
Long Island	23,850	243	33	13.6%	0.1%
Mid-Hudson	10,720	194	41	21.1%	0.4%
Mohawk Valley	7,215	142	32	22.5%	0.4%
New York City	29,085	287	55	19.2%	0.2%
North Country	5,529	148	29	19.6%	0.5%
Southern Tier	8,395	205	28	13.7%	0.3%
Western New York	17,739	349	64	18.3%	0.4%
Total	**138,281**	**2,419**	**456**	**18.9%**	**0.3%**

B.3.4 Safety

The project team placed the highest priority on the safety of field staff and participants. Field staff were trained to follow strict carbon monoxide and gas leak protocols, which were developed for the 2015 RSBS. An additional, separate safety protocol developed for the 2019 RBSA provided further guidance about general safety in participants' homes, including basics such as ladder safety and removing oneself from unsafe conditions.

B.3.5 Data Quality

The project team ensured a high level of data quality through multi-layered quality assurance and QC processes:

- Field technician training.
- Data collection tool.
- QC site visits.
- Data collection protocols.
- Weekly meetings.
- Data collection tool completeness checks.
- Phase I data cleaning and QC (conducted by PSD).
- Phase II data cleaning and QC (conducted by Cadmus).

B.3.5.1 Field Technician Training

All field staff deployed by PSD and Honeywell hold BPI certifications or are certified HERS Raters, and all are experienced with blower door equipment and other facets of home energy site visits. With oversight and contributions from NYSERDA and Cadmus, PSD performed the initial, two-day in-person project training for PSD, Honeywell, and Cadmus field staff at the NYSERDA offices and at a residential off-site setting. The presenters recorded each classroom session to allow trainees to review the content later and to support training of technicians who could not attend the in-person training on the scheduled dates.

PSD and Cadmus subsequently completed two additional rounds of training for field staff who could not attend the initial training or who were brought onto the project at a later date. These trainings required that the field staff view all recorded sessions from the in-person training as well as participate in a live webinar training. Field staff were also required to shadow a previously trained field technician on a site visit before conducting a site visit on their own.

B.3.5.2 Data Collection Tool

Field staff captured and submitted site visit data using the iPad-based PSD data collection tool, which was an improved version of the software PSD deployed for the 2015 RSBS. One improvement that helped ensure a high level of data quality was a completeness check, which required that all inputs be provided before the data for a given site could be submitted as final. Cloud-based syncing helped minimize the possibility that collected data would be lost, and more data than for the 2015 RSBS were collected through drop-down menus instead of text entry, which provided consistency in data entry. The data collection tool and all data handling processes were implemented with enhanced security in accordance with NYSERDA protocols.

B.3.5.3 Quality Control Site Visits

Cadmus performed follow-up QC site visits for approximately 10% of the site visits performed by each field technician to identify and correct data collection problems. Cadmus staff scheduled, conducted, and evaluated these visits, providing an additional $100 gift card to each participant. During QC data collection, the Cadmus field technician reviewed a copy of the original site report and noted any differences between that report and their own findings. After each QC site visit, Cadmus sent a summary of any identified data collection errors to the relevant field management staff at PSD or Honeywell, who shared the discrepancies with the field technician. QC site visits occurred during the data collection period to allow Cadmus, PSD, and Honeywell to correct any data collection issues before subsequent site visits. In addition, data corrections

for all 50 QCd sites were incorporated into the database during the data cleaning and QC process.

B.3.5.4 Weekly Field Staff Meetings

With input and participation from Cadmus, PSD conducted weekly meetings with project field staff from PSD and Honeywell during the period of data collection from early October 2018 to mid-December 2018. Field staff were required to attend the meetings if they were not in the field at that time and if they had completed one or more site visits that week or were scheduled to complete at least one site visit the following week. These meetings provided a mechanism for Cadmus and PSD to reinforce key concepts and were often informed by issues noted during the QC site visits. The meetings also gave field staff a weekly forum for asking questions and raising any issues or concerns regarding the data collection tool, data collection protocols, or other topics related to the site visits.

B.3.5.5 Data Collection Protocols

Cadmus created data collection protocols for major data collection categories, such as heating and cooling equipment, building envelope details, and appliances. Given the short project timeline, the data collection protocol documents did not pass through the formal review processes in time to be shared with the field technicians, but the process of generating and reviewing the documents helped ensure that Cadmus and PSD were aligned regarding how data should be collected, which in turn informed communication with field staff and updates to the PSD data collection tool. The data collection protocols will also a valuable resource for those who use the data and need a better understanding of how specific data points were captured, as well as for project staff working on future iterations of the project.

B.3.5.6 Quality Control and Data Cleaning

Project staff ensured a high level of data quality through a multi-layered, two-phase approach to QC. The initial phase of QC, which was performed by PSD, included several tasks:

- An initial completeness review.
- An examination of key fields for technical inconsistencies and identification of apparent discrepancies for deeper, technical review.
- Resolution of identified technical discrepancies.
- Extensive cleaning of successive batches of site data using a combination of automated and manual checks.

PSD implemented the automated checks based on checks it identified and on a list provided by Cadmus, which defined numerous data quality checks related to value ranges and consistency across values.

After receiving each batch of draft, clean data, Cadmus performed additional, in-depth data cleaning and QC. The process comprised multiple layers of tasks and included a combination of automated and manual checks:

- Cadmus checked records for completion, verified that values fell within expected ranges, and checked for internal consistency. Project staff verified internal consistency through a QC punch list for each record type. The punch list outlined checks for specific combinations of information within the record.
  - An example of completion: If a furnace record was missing a key field—such as heating capacity—the record was flagged for deeper review.
  - An example of expected ranges: If a furnace record's heating capacity was entered as "12" and the heating capacity units were entered as "Btuh," the record was

flagged for deeper review, because 12 Btuh is not within the expected range for furnace heating capacities.

  - An example of internal consistency: If a furnace record's fuel type was entered as "Electricity" and the heating capacity units were entered as "Btuh," the record was flagged for deeper review, because capacity for electric HVAC equipment typically is not reported in British thermal units.

- For discrepancies found during the 50 sites where QC site visits were performed, Cadmus updated information collected during the original site visit with data collected during the QC site visit. For the QC site visits, technicians were provided with the original set of information collected on site and were directed to verify that the conditions on were accurately reflected in the data. Where necessary, the QC technicians recorded updates or new information.
- Cadmus performed site-level checks to detect and correct contradictory information that may have been entered on site, as well as to identify potential gaps in the site visit data. As an example, if a home's primary heating system was identified as a gas furnace but no gas utility was entered for the site, that site was flagged for review.

After each site and record was checked for completion and internal consistency, records and sites that had been flagged were reviewed by veteran field staff. Some equipment categories, such as mechanical equipment and building envelope, also received a more rigorous review by subject matter experts. Updates and corrections to the data were validated by reviewing photos and notes from the original site visit, by reviewing photos, notes, and data collected during the QC site visits, by confirming information through online databases, and by comparing site data against the survey or tax assessment data.

Data cleaning continued into the data analysis phase. As preliminary results became available, they were reviewed by a team of subject matter experts. In the case of unusual or unexpected results, the data quality team conducted a detailed review of the information in question using the resources outlined above.

B.3.5.7 Inferred Values

Insulation values such as type and thickness often cannot be collected during site visits when attic or crawlspaces are inaccessible or walls cannot be probed. For certain cases, Cadmus inferred insulation values based on various criteria, including New York State Building Code requirements. Cadmus created a chart for State building code–required R-values and U-factors for floors, walls, ceilings, windows, and slabs. State code insulation values were determined for each home based on an assortment of criteria, including the year the home was built (and the corresponding State code requirements for that year), the county, the heating/cooling equipment efficiency, and the glazing area percentage.

Cadmus also created separate R-value and U-factor tables for general insulation and window values, respectively. The R-value table summarized average R-values per inch for various insulation types. Wherever possible, these values were determined from American Society of Heating, Refrigerating and Air-Conditioning Engineers or U.S. Department of Energy standards. Cadmus also mapped combinations of various window frame and glazing types to window U-factors using National Renewable Energy Laboratory data. Low-e glazing types were assumed to have the same U-factor as non-low-e glazing types, because an accurate and comprehensive U-factor database for low-e glazing types was not available.

To determine inferred inches of insulation, Cadmus divided the State code R-value by the average R-value per inch for the known insulation type. If the insulation type was not known, the

team used an average R-value per inch of 3.0. For wall insulation, where at least two compliance paths were allowed, Cadmus assumed that all insulation was provided in the wall cavities. Insulation type and/or thickness values were inferred for 38 homes in total—23 existing homes and 15 new homes. A data source column in the RBSA site visit dataset indicates whether the insulation values or a given envelope surface were observed or inferred, though in some cases values were inferred by field staff based on other information available on the site.

Window U-factors are not readily available on site, especially in older homes. Cadmus directed field staff to collect only documented U-factor values, but the collected data often included U-factors that appeared to be estimates. To provide U-factors for energy modeling or other purposes, Cadmus inferred window U-factor values based on the State building code requirements in force at the time of the home's construction (if any) and on window frame and glazing type. Cadmus retained U-factors recorded on site only if the building was a new home and the U-factor met State code. For new and existing homes, if the U-factor did not meet State code requirements, the project team replaced the U-factor with a value from either the State code in force at the time of the home's construction or from the window assembly table, using whichever value was smaller. Inferred window U-values were applied to 361 existing homes and 18 new homes. A data source column in the RBSA site visit dataset indicates whether a given U-factor value was inferred or collected.

Where applicable throughout the RBSA site visit dataset, data source columns provide an indication of whether provided values (such as year of manufacture or heating equipment efficiency) were known, estimated, or inferred.

B.3.6 Stratification Weights

When calculating totals, means, proportions, or other summary statistics for a population that encompasses more than one of the six strata, a sample weight must be applied to each observation to provide the appropriate contribution for the population. Cadmus calculated a weight for each of the six strata by dividing the estimated population of single-family homes in that stratum by the achieved site visit sample size. Table 14 shows the population, site visit completion, and calculated survey weight for each of the six strata.

TABLE 14. SITE VISIT STRATIFICATION WEIGHTS

Climate Zone	Population		Site Visit Completions		Site Visit Weights	
	Existing Homes	New Homes	Existing Homes	New Homes	Existing Homes	New Homes
Climate Zone 4	2,516,613	12,105	85	5	29,607.21	2,421.00
Climate Zone 5	1,945,375	18,451	206	68	9,443.57	271.34
Climate Zone 6	807,178	7,169	70	22	11,531.11	325.86
Total	**5,269,166**	**37,725**	**361**	**95**		

B.3.7 Limitations and Suggestions for Future Studies

The 2019 RBSA achieved the impressive feat of completing 456 site visits within four months of project award, including assembling the project team, updating necessary project tools and documentation, and implementing all aspects of the required recruiting infrastructure and processes. At the same time, the data quality steps outlined above ensured that the project delivered high-quality data. This section summarizes aspects of the project methodology and processes that worked well, along with areas for improving the next iteration of the study. This section also addresses any notable data reliability issues.

Aspects of the 2019 RBSA site visit methodology and process that worked well include the following:

- With the accelerated timeline of the project, PSD's ability to update the iPad data collection tool used in the 2015 RSBS quickly enough to support October data collection was critical to project success. In addition, though completing upgrades to the tool carried over into the data collection period, the software proved to be an efficient and reliable data collection solution.
- Distributing site visits among PSD and Honeywell allowed enough bandwidth to complete the site visits within the provided amount of time.
- Recruiting for site visits from the pool of survey respondents generally met expectations, with a response rate of nearly 20%.
- The electronic Amazon gift cards were well-received by most recipients, and providing the cards to recipients was a relatively easy task to manage.
- QC site visits proved invaluable for identifying and correcting data collection problems, whether they resulted from misunderstandings or a lack of alignment regarding the required level of effort. Notable isolated problems found early in the project included incorrectly characterized lighting by some field staff, particularly where bulbs were concealed by shades, and insulation values in accessible attic spaces that appeared to have been assumed rather than observed. Quick action by Cadmus, PSD, and Honeywell helped correct these and other early issues.
- As noted above, weekly field staff meetings were helpful for providing essential communication between field staff and management, and developing the data collection protocols ensured that project team members from Cadmus and PSD had the same understanding of how data points would be collected.
- Extensive data cleaning and QC from PSD and Cadmus provided high-quality, useful data. Combining automated checks with intensive site- and measure-level reviews by subject matter expects allowed for discrepancies and other data quality problems to be identified and corrected, often by reviewing field technician notes and photographs.
- Completing all site visits by mid-December avoided most weather-related problems, which helped minimize the need to cancel or reschedule site visits.
- Of 267 site visit participants who responded to questions about customer satisfaction in a follow-up survey, 99% (264) reported being *somewhat* or *very satisfied* with the site visit, and 90% (237) reported being *very satisfied*. The most common feedback was that participants wanted a report summarizing site visit results, which was not a component of this study.

The following items summarize limitations of the methodology and data and include suggestions for future iterations of the project:

- As mentioned in the *B.2.6 Limitations and Suggestions for Future Studies* section for surveys above, the recruiting approach used for the 2015 RSBS resulted in an impressive response rate of 13.6% and should be used in future efforts if practical within the project timeline. a long enough timeline to allow the sample to be drawn from utility customer data appears to be key, at least partly because it may allow the study to receive accurate names, telephone numbers, and possibly even email addresses. Being able to recruit through mail, telephone calls, and particularly email would help to reduce the cost of contacting potential respondents and help to achieve the most representative sample practical.

- The most notable limitation of project data resulted from the small sample size of only five site visits for new homes completed in Climate Zone 4, which comprises New York City, Long Island, and the Mid-Hudson EDRs. With a sample size of only five homes, results for the Climate Zone 4 new homes stratum cannot be considered representative. After consultation with NYSERDA, Cadmus shaded results for that stratum in data tables that focus on new homes. Further, Cadmus removed observations from those five homes from all other calculations to eliminate the possibility of their introducing significant skew to other results.
- As mentioned in the survey limitations and recommendations above, if characterizing new homes remains a high priority, special care should be taken to construct a new homes sample from all available sources, focusing especially on EDRs in Climate Zone 4 and Climate Zone 6. These sources should include tax assessment data, purchased sample, and possibly even address lists from high-volume builders. Social media may also prove useful. This approach should be combined with a more deliberate recruiting methodology, such as the one used for the 2015 RSBS, to obtain the most responses from this typically small population of homes.
- The accelerated timeline caused many challenges with deploying field staff and the necessary tools and processes. A longer timeline would allow for more flexibility in project planning. Extending the length of time available for completing site visits would also allow the field work to be completed with fewer field staff, which would simplify project planning and support greater consistency in data collection.
- The lower-than-expected response rates caused a slower ramp up in site visits, because fewer survey respondents than expected were available to recruit for site visits. This put further pressure on PSD and Honeywell to complete a high volume of site visits in a short period of time. After consultation with NYSERDA, Cadmus was able to shift the expected timeline to complete site visits by December 15, 2018, instead of November 30. This allowed time for the rapid scale-up in recruiting to take effect, especially for new home participants.
- As expected, surveys and site visits delivered notably different results for some characteristics. While the large discrepancy in the number of reported heat pump water heaters is an obvious example that is difficult to fully explain, less dramatic discrepancies such as different reported percentages of appliances with ENERGY STAR ratings result at least partly from differences in methodology: survey questions ask about ENERGY STAR ratings only for appliances less than 10 years old, while site visits collected that data for appliances of any age. Appendix A provides results for many metrics from both survey and site visit data. Where results differ between survey and site visit data, Cadmus endeavored in the report to identify the more credible source using engineering judgement, available market penetration/saturation benchmarks, and other information.
- Cadmus recommends that in future studies, the project team continue to align survey and site visit methodology where this can be accomplished without losing the ability to compare key findings with results from the previous study.

APPENDIX C. SURVEY INSTRUMENT

This appendix presents the survey script used during the NYSERDA 2019 Residential Building Stock Assessment (RBSA), for which in-depth surveys were completed with 2,419 occupants of single-family homes throughout the 10 Economic Development Regions of New York State.

The key objectives of the survey were to provide up-to-date, self-reported estimates of equipment types, fuel types and uses, vintages, and efficiencies, as well as information about building characteristics, demographics, homeowner energy consumption attitudes and behaviors, participation in energy efficiency programs, and willingness to pay for different types of efficient equipment. Additionally, the surveys were used to recruit households for site visits.

The RBSA online and phone survey collected data from September 28, 2018, through December 3, 2018. Using input from the New York State Energy Research and Development Authority's (NYSERDA) evaluation and program staff, Cadmus designed the survey to closely align with the 2015 RSBS baseline survey to ensure that results could be compared. The survey and survey programming were reviewed and approved by NYSERDA prior to the launch.

Questions added for the 2019 RBSA collected information about several details:

- Connected devices
- Smart thermostats
- Number of ductless mini-split heat pumps installed
- Supplemental heating systems
- Willingness to pay at various levels for high-efficiency equipment
- Utility bill payment and assistance

The project team recruited participants to complete this survey either online or by telephone using a multimode approach. The process began with mailing postcards to a random sample of single-family households. These postcards encouraged recipients to complete the survey in English or Spanish using a link to an online version or by calling a field agent using a toll-free number.

Postcards were sent in batches. Approximately 10 days after each mailing, the project team followed up with telephone calls to non-responders for each record where a telephone number was matched to the sampled address. Additionally, NYSERDA followed up these attempts with an email reminder to a subset of non-responders where email addresses were available.

The survey asked respondents whether they would be interested in participating in a site visit, and respondents who said yes made up the sample frame for recruiting site visit participants. The RBSA provided an incentive of $20 to participants who completed the survey and an additional $100 to participants who completed a site visit.

NYSERDA RESIDENTIAL BUILDING STOCK ASSESSMENT – SINGLE FAMILY/TENANT CODEBOOK

The question included several survey modules:

- Introduction
- Screener
- Building Shell (Section B)
- ENERGY STAR® Awareness (Section E)
- Kitchen Appliances (Section K)
- Heating and Cooling (Section H)
- Water Heating (Section WH)
- Clothes Washing and Drying (Section C)
- Home Lighting (Section L)
- Pool and Spa (Section P)
- Small Household Appliances (Section A)
- Miscellaneous Equipment (Section M)
- Internet Enabled Devices (Section I)
- Utility Company (Section U)
- Energy Efficiency (Section F)
- Purchase Decisions (W)
- Demographics and Recruitment (Section D)

NOTE:

- A code of (-8) means don’t know.
- A code of (-9) means Prefer not to answer.
- 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 respondent answered some of the categories, then the empty categories were assumed to be zero.

Introduction

INTRO_1 (web) Thank you for taking time out of your busy schedule to provide information on your household's energy use. The first eight questions will confirm your eligibility. If you are eligible and complete the survey, as a token of our appreciation, we will send you a $20 electronic Amazon gift card upon completion of the survey.

If you would like to complete the survey by phone, please call (844) 756-2858 or send an email to NYSERDASurvey@honeywell.com.

If you experience any technical difficulties, please contact Amanda McLeod by emailing Amanda.McLeod@Cadmusgroup.com or calling (617) 673-7115.

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

For answers to frequently asked questions, click here (a new window will open).

If you have any questions about the content or use of this survey, you can visit the research study website at www.nyserda.ny.gov/2018-RBSA or by calling (844) 756-2858.

INTRO_2 (web) We are surveying residential customers on behalf of the New York State Energy Research and Development Authority (NYSERDA) to learn more about household energy using equipment and opinions on energy use.

Please be assured that the information you provide will be kept confidential to the extent permitted by law. NYSERDA will only use summary-level data and will not identify individual respondents. This information will be used to design energy efficiency programs to help households throughout New York State increase energy efficiency and reduce energy consumption.

INTRO_3 (WEB) Please enter the survey ID from the NYSERDA postcard in the box below and click the arrow button to enter the survey.

INTRO (phone) Hello, my name is _____ and I'm calling on behalf of the New York State Energy Research and Development Authority, or NYSERDA. May I please speak with [FIRST NAME] [LAST NAME]?

This is not a sales call. You may have recently received a postcard regarding an important energy study NYSERDA is conducting to learn more about households' energy using equipment. Our records show that your survey has not been completed and we would like to complete the survey over the phone.

The first eight questions will confirm your eligibility. If you are eligible and complete the survey, as a token of our appreciation, we will send you a $20 electronic Amazon gift card upon completion of the survey. Our records show that your survey has not been completed, and we would like to complete the survey over the phone. The survey will take between 15 and 30 minutes depending on your responses.

This information will be used to design energy efficiency programs to help households throughout New York State increase energy efficiency and reduce energy consumption.

The results of the study will only be reported at the summary level, that is, aggregated (combined) with the results of similar homes. Your answers and information will be kept confidential to the extent permitted by law and will not be identified with you or your home address. For quality assurance and training purposes this call will be recorded.

Do you have time today to help me with this important research study? [IF YES, CONTINUE. IF NOT, ASK FOR A TIME TO CALLBACK AND SCHEDULE A CALLBACK TIME]

[IF NEEDED: If you have any questions about the content or use of this survey, you can visit the research study website at www.nyserda.ny.gov/2018-RBSA.]

Screener

S0. The address we have on file is [${e://Field/mailing_address}, ${e://Field/city}, ${e://Field/state} ${e://Field/zip}]. Is this correct?

1. Yes
2. No [TERMINATE]
-9. Prefer not to answer [TERMINATE]

S1. 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. Other [PLEASE SPECIFY]
9. None of the above – I no longer live at that address [TERMINATE]
10. Prefer not to answer

[TERMINATE SCRIPT] Thank you for your help but unfortunately your household does not qualify for this survey. Have a nice day!

S2. Do you occupy this home at least part of the year, or did you 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]
-8. I don't know [TERMINATE]
-9. Prefer not to answer [TERMINATE]

[TERMINATE: Thank you for your help but unfortunately your household does not qualify for this survey. Have a nice day!]

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 or mortgaged
2. Rent
4. Other, specify
-9. Prefer not to answer

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]
-8. Don't know
-9. Prefer not to answer

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
-9. Prefer not to answer

B2bc1. Spring
B2bc2. Summer
B2bc3. Fall
B2bc4. Winter
B2bc5. Varies (SPECIFY)

o_B2b. [ASK IF B2bc5=1] Description of occupation time period.

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

1. Mobile or manufactured home
2. Single family detached house
3. Single family attached house such as a duplex, townhouse, or rowhouse
4. Apartment building or condominium with 2 to 4 units
5. Apartment building or condominium with 5 or more units [THANK AND TERMINATE]
6. Other [SPECIFY] [THANK AND TERMINATE]
-8. Don't know [THANK AND TERMINATE]
-9. Prefer not to answer [THANK AND TERMINATE]

[TERMINATE SCRIPT] Thank you for your help but unfortunately your household does not qualify for this survey. Have a nice day!

B3a. [ASK IF B3=3] Including your unit, how many individual housing units are in this attached rowhouse/townhouse? (Enter number of units below)

____ # of units [1-4] [THANK AND TERMINATE IF MORE THAN 4]
-8. Don't know [THANK AND TERMINATE]
-9. Prefer not to answer [THANK AND TERMINATE]

B3a2. [ASK IF B3=4] Including your unit, how many individual housing units are in your apartment or condominium building? (Enter number of units below)

____ # of units [1-2000] [THANK AND TERMINATE IF MORE THAN 4]
-8. Don't know [THANK AND TERMINATE]
-9. Prefer not to answer [THANK AND TERMINATE]

[TERMINATE SCRIPT] Thank you for your help but unfortunately your household does not qualify for this survey. Have a nice day!

B3b. Not counting the basement, how many stories are there in this [SELECTED HOME TYPE]? (Enter number of stories below)

___ # of stories [1-4]
-8. Don't know
-9. Prefer not to answer

B3c. [SKIP TO B4 IF B3<> 4] Aside from the building you live in, are there other buildings in this apartment or condominium complex with housing units? (Check one)

1. Yes
2. No
-9. Prefer not to answer

B3d. [ASK IF B3c <> 1 or 2] In total, how many apartment or condominium buildings are at this location? (Enter number of buildings below)

__ # of buildings [1-75]
-9. Prefer not to answer

B3e. [ASK IF B3=2] Which style best describes your home? Is it a …

1. A-Frame
2. Cape Cod
3. Colonial
4. Contemporary
5. Gothic
6. Ranch
7. Split level
8. Victorian
9. Other [SPECIFY]
10. Don't know
-9. Prefer not to answer

B4. How many bedrooms are there in your home? Include bedrooms currently used for other purposes. (Enter number of bedrooms below)

__ # of bedrooms [0-8]
-9. Prefer not to answer

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

_____ square feet [100-12,000]
2. Nonsensical answer
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

B6. [ASK IF B3 <> 4] Does your home have a heated or unheated basement? (Check one)

1. Yes, a heated basement
2. Yes, a partly heated basement
3. Yes, an unheated basement
4. No basement
-8. Don't know
-9. Prefer not to answer

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
14. 2015
15. 2016
16. 2017
17. 2018

-8. Don't know
-9. Prefer not to answer

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]

-8. Don't know [SKIP TO B9]
-9. Prefer not to answer

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

____ year of renovation [2012-2018]

-9. Prefer not to answer

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

1. Yes
2. No [SKIP TO E1]

-9. Prefer not to answer

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.

[PROGRAMMING NOTE: Display the logo 

on the screen.]

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. Prefer not to answer

E2. [ASK IF B7=14-17] Is your home an ENERGY STAR Certified Home, or does it have any other energy efficiency rating?

1. Yes, ENERGY STAR rated
2. Yes, Home Energy Rating System (HERS) score
3. Yes, Home Energy Score (HES)
4. Yes, other energy efficiency rating
5. No, does not have an energy efficiency rating
6. Don’t know if it has an energy efficiency rating

-9. Prefer not to answer

[PROGRAMMING NOTE: Display the logo 

on the screen.]

E2a. [ASK IF E2=4] Please describe the energy efficiency rating below.

E2b. [ASK IF E2=2] What is the HERS index score for your home?

E2c. [ASK IF E2=3] What is the Home Energy Score for your home?

Kitchen Appliances

Please think about your kitchen appliances for this next set of questions.

icon type pending team's approval

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 Prefer not to answer

K1a. Microwave ovens
K1b. Ovens with burners on top
K1c. Separate stove tops
K1d. Separate oven units (wall or cabinet)

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
-8. Don't know
-9. Prefer not to answer

K2c1. Electricity
K2c2. Natural gas from underground pipes
K2c3. Propane
K2c4. Some other fuel [SPECIFY]

o_K2. [ASK IF K2c4=1] Description of other type of fuel.

K3. [SKIP IF K1c=0 OR -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
-8. Don't know
-9. Prefer not to answer

K3c1. Electricity
K3c2. Natural gas from underground pipes
K3c3. Propane
K3c4. Some other fuel [SPECIFY]

o_K3. [ASK IF K3c4=1] Description of other type of fuel.

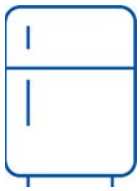
K4. [SKIP IF K1d=0 OR -9] What type of fuel does your separate oven(s) use? (Select all that apply)

For K4c1 through K4c4
0. Not mentioned
1. Mentioned
-8. Don't know
-9. Prefer not to answer

K4c1. Electricity
K4c2. Natural gas from underground pipes
K4c3. Propane
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 full-sized refrigerator? Please do not include wine or keg coolers.

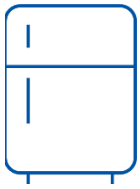


1. Full-sized, four doors: two refrigerator doors and two freezer doors on bottom (French style)
2. Full-sized, three doors: two refrigerator doors and a freezer door on bottom (French style)
3. Full-size with two doors, freezer next to the refrigerator (side by side)
4. Full-size with two doors, bottom freezer
5. Full-size with two doors, top freezer
6. Full-size with one door
7. Half-size or compact
8. Other [SPECIFY]

-9. Prefer not to answer

o_K5. [ASK IF K5=8] Description of other type refrigerator.

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

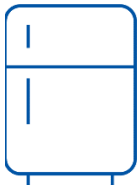
-8. Don’t know

-9. Prefer not to answer

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)

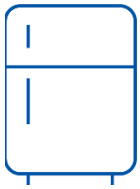
1. Yes
2. No
-8. Don't know
-9. Prefer not to answer

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 [SKIP TO K11]
-9. Prefer not to answer

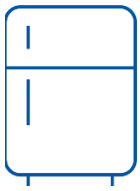
K9. How many other refrigerators do you have plugged in and running in your home? (If none, please enter zero)



For K9 through K9a
_ # of units [0-9]
-9. Prefer not to answer

K9. Full size refrigerators
K9a. Compact refrigerators

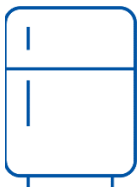
K10a. [SKIP TO K11 IF (K9+K9a)=0 OR -18] About how old is this second refrigerator? (Check one)



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

-8. Don't know
-9. Prefer not to answer

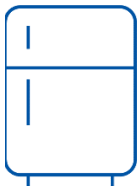
K10b. [SKIP TO K11 IF (K9+K9a)=1 OR -8] About how old is this third refrigerator? (Check one)



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

-8. Don't know
-9. Prefer not to answer

K10c. [SKIP TO K11 IF (K9+K9a)=2 OR -7] About how old is this fourth 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

-8. Don't know
-9. Prefer not to answer

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]

-9. Prefer not to answer

K11a. [SKIP IF (E1 <> 2 AND 3) AND (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

-4. Interviewer/respondent error
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

K13. Does your household have a stand-alone freezer plugged in and running, one that is not part of a refrigerator? (Check one)

1. Yes
2. No [SKIP TO H1]
-9. Prefer not to answer

K14. How many stand-alone freezers do you have plugged in and running in your home? (Enter number of freezers below)

_ # of units [1-9]
-9. Prefer not to answer

K15at. [ASK IF K14 >= 1]What type of freezer is this first stand-alone freezer? (Check one)

1. Chest
2. Upright
-9. Prefer not to answer

K15a. [ASK IF K14>=1] And what is the approximate age of this first stand-alone freezer? (Please round to the nearest whole number, for an age less than one year please enter 0)

___ # of years [0-100]
-8. Don't know
-9. Prefer not to answer

K15bt. [SKIP TO K17a IF K14=1] What type of freezer is this second stand-alone freezer? (Check one)

1. Chest
2. Upright
-9. Prefer not to answer

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

___ # of years [0-100]
-8. Don't know
-9. Prefer not to answer

K15ct. [SKIP TO K17b IF K14=2] What type of freezer is this third stand-alone freezer? (Check one)

1. Chest
2. Upright
-9. Prefer not to answer

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

___ # of years [0-100]
-8. Don't know
-9. Prefer not to answer

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

1. Yes
3. No
-8. Don't know
-9. Prefer not to answer

K17b. [SKIP IF K14=1 OR (E1 <> 2 AND 3) OR (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 stand-alone freezers ENERGY STAR rated? (e.g. Does it have the ENERGY STAR logo on it?)

1. Yes, all
2. Yes, some
3. No
-8. Don't know
-9. Prefer not to answer

Heating and Cooling

Now, thinking about your home's heating and cooling system, please answer the following questions.

H1. [ASK IF B3=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
-8. Don’t know [SKIP TO H7a]
-9. Prefer not to answer

H2. What is the primary type of fuel used for heating your home? (Check one) What additional types of fuel are used in your home?

1. Electricity
2. Natural gas from underground pipes
3. Propane (bottled gas)
4. District steam
5. Fuel oil
6. Kerosene
7. Wood
8. Wood pellets
9. Solar
10. Other [SPECIFY]
-8. Don’t know
-9. Prefer not to answer

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. Ducted air source heat pump
5. Ground source heat pump
6. Ductless mini-split heat pump
7. Baseboard heat
8. Heating stove burning wood
9. Heating stove burning coal
10. Wood pellet stove
11. Fireplace
12. Portable electric heater
13. Portable kerosene heater
14. Other [SPECIFY]
-8. Don't know
-9. Prefer not to answer

o_H3. [ASK IF H3=12] Description of other type of primary heating system.

H3a. [ASK IF H3=6] Thinking about your ductless mini-split heat pump system, how many indoor units do you have in your home?

___ # (range 0-5)
-8. Don't know
-9. Prefer not to answer

H3b. [ASK IF H3=6] How many outdoor units does your home have?

___ # (range 0-5)
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

H5a. What type of supplemental heating system do you have in your home? (Check all that apply)

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. Ducted air source heat pump
5. Ground source heat pump
6. Ductless mini-split heat pump
7. Baseboard heat
8. Heating stove burning wood
9. Heating stove burning coal
10. Wood pellet stove
11. Fireplace
12. Portable electric heater
13. Portable kerosene heater
14. Other [SPECIFY]
-8. Don't know
-9. Prefer not to answer

H5b. [ASK IF H3=4 and H5a=1] Does this furnace use the same ducting your heat pump system and serve as a backup for that system?

1. Yes
2. No
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

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]
-9. Prefer not to answer

H7aw. Wood fireplaces
H7ag. Natural gas fireplaces
H7ap. Propane fireplaces
H7ae. Electric fireplaces

H7b. How many of the following stoves or heaters do you use in your home on a regular basis in the winter? (If none, please enter zero)

For H7b through H7e
_ # of units [0-9]
-9. Prefer not to answer

H7b. Heating stove burning wood
H7c. Pellet stove
H7d. Portable electric heaters
H7e. 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]
-9. Prefer not to answer

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
-9. Prefer not to answer

H8ac1. Electricity
H8ac2. Natural gas from underground pipes
H8ac3. Propane (bottled gas)
H8ac4. District steam
H8ac5. Fuel oil
H8ac6. Kerosene
H8ac7. Wood
H8AC9. 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]
-8. Don't know
-9. Prefer not to answer [SKIP to H19]

H10. [ASK IF B3=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
-8. Don't know [SKIP TO H15]
-9. Prefer not to answer

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]
-8. Don’t know
-9. Prefer not to answer

o_H11. [ASK IF H11=4] Description of other type of primary air conditioning equipment.

H12. About how old is your primary air conditioning 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
-8. Don’t know
-9. Prefer not to answer

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
-4. Interviewer/respondent error
-8. Don't know
-9. Prefer not to answer

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
-4. Interviewer/respondent error
-8. Don't know
-9. Prefer not to answer

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
-9. Prefer not to answer

H16. [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
-9. Prefer not to answer

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]
-4. Interviewer/respondent error
-9. Prefer not to answer

H19. What type of thermostat controls your primary heating and/or cooling equipment? A programmable thermostat can be set to automatically adjust the temperature setting at the times of the day or night that you choose. Or a smart thermostat, which attempts to save energy and/or optimize comfort by automatically adjusting settings based on your behavior, such as when you are home. (Check one)

1. Programmable
2. Smart
3. Manual [SKIP TO H22]

-8. Don't know
-9. Prefer not to answer

H19a. [ASK IF H19=2] What brand of smart thermostat controls your primary heating and/or cooling equipment? (Check one)

1. Ecobee
2. Honeywell Lyric
3. Nest
4. Other [SPECIFY]

-8. Don't know
-9. Prefer not to answer

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

-8. I don't know
-9. Prefer not to answer

H20a. How frequently do you manually change the temperature of your thermostat?

1. Never
2. Rarely
3. Sometimes
4. Frequently

-9. Prefer not to answer

H18. Does the thermostat that controls your primary heating and/or cooling equipment connect to the internet to allow you change settings using your phone or computer?

1. Yes
2. No

-8. Don't know

-9. Prefer not to answer

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

_ # of units [0-9]

-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

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 rated? (e.g. Does it have the ENERGY STAR logo?) (Check one)

1. Yes
3. No
-8. Don't know
-9. Prefer not to answer

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 rated? (e.g. Does they have the ENERGY STAR logo on them?) (Check one)

1. Yes, all
2. Yes, some
3. No
-8. Don't know
-9. Prefer not to answer

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

_ # of units [0-9]
-9. Prefer not to answer

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]
-9. Prefer not to answer

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
H27f. Energy recovery ventilator (ERV) or heat recovery ventilator (HRV)?
H27g. Fresh-air intake connected to heating and/or cooling system to bring in outside air

Water Heating

Next, we would like you to think about your home's water heating system.

WH1. [ASK IF B3=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
-8. Don't know [SKIP TO WH6]
-9. Prefer not to answer

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

1. Heat pump water heater
2. Stand-alone storage tank
3. Tankless or on demand water heater
4. Part of the heating system boiler
5. Other [SPECIFY]
-8. Don't know
-9. Prefer not to answer

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]
-8. Don't know
-9. Prefer not to answer

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

-8. Don't know
-9. Prefer not to answer

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
4. Interviewer/respondent error

-8. Don't know
-9. Prefer not to answer

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]

-8. Don't know [SKIP TO WH8]
-9. Prefer not to answer

WH7. What other type of system do you use as your primary water heating system? (Check one)

1. Heat pump water heater
2. Stand-alone storage tank
3. Tankless or on demand water heater
4. Part of heating system boiler
5. Other [SPECIFY]

-9. Prefer not to answer

o_WH7. [ASK IF WH7=5] Description of other type of water heating system.

WH8. Do you have a dishwasher? (Check one)

1. Yes
2. No [SKIP TO C1a]
-9. Prefer not to answer

WH9. Approximately how old is your primary 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
-8. Don’t know
-9. Prefer not to answer

WH10. [ASK IF (E1=2 OR 3) AND WH9 <> 4, 5, OR 6] Is this dishwasher ENERGY STAR rated? (e.g. Does it have the ENERGY STAR logo on it?) (Check one)

1. Yes
2. No
-8. Don’t know
-9. Prefer not to answer

WH11. Approximately how many loads of dishes does your household wash in a typical week in the dishwasher [IF HOME OCCUPIED<12 MONTHS A YEAR, WHILE THE HOME IS OCCUPIED]? (Enter number of loads below)

__ # of loads [0-35]
-9. Prefer not to answer

Clothes Washing and Drying

Please think about your home’s washing and drying equipment to answer the next set of questions.

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

1. Yes [SKIP TO C3]
2. No [SKIP TO C7a]
-9. Prefer not to answer

C1b. [ASK IF B3=4] Do you have a clothes washer in your home? 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]
-9. Prefer not to answer

C3. Approximately how many loads of laundry does your household wash in a typical week? (Enter number of loads below)

__ # of loads [0-35]
-8. Don't know
-9. Prefer not to answer

C3b. [IF HOME OCCUPIED<12 MONTHS A YEAR, WHILE THE HOME IS OCCUPIED] Approximately how many loads of laundry does your household wash in a typical week while the home is occupied? (Enter number of loads below)

__ # of loads [0-35]
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

C6b. [ASK IF (E1=2 OR 3) AND C6 <> 4, 5, AND 6] Is this clothes washer ENERGY STAR rated? (e.g. Does it have the ENERGY STAR logo on it?) (Check one)

1. Yes
2. No
-8. Don't know
-9. Prefer not to answer

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

1. Yes [SKIP TO C8]
2. No [SKIP TO L2]
-9. Prefer not to answer [SKIP TO L2]

C7b. [ASK IF B3=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]
-9. Prefer not to answer [SKIP TO L2]

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]
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

Home Lighting

Now, we would like to learn a little about your home's lighting equipment.

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
-9. Prefer not to answer

L2c1. Skylights
L2c2. Tubular skylights, also referred to as solar tubes or sun tunnels (sun tunnels channel sunlight from your roof, down a highly reflective tube into the room below)
L2c3. Large uncovered window areas
L2c4. None of the above

L3. Which of the following types of lighting controls do you use inside or outside your home? (Select all that apply)

For L3c1 through L3c4
0. Not mentioned
1. Mentioned
-9. Prefer not to answer

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
-9. Prefer not to answer

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
-9. Prefer not to answer

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.) Remember to include can lights or other light bulbs in hard to reach places such as tall ceilings or hallways or closets.

For L5a through L5d
__ # of bulbs [0-99]
-8. Don't know
-9. Prefer not to answer

L5a. CFL Bulbs
L5b. LED Bulbs
L5c. Incandescent Bulbs
L5d. Other bulbs

L7. How many light bulbs outside your home are typically used 2 or more hours each day? Please include only lights that are controlled from your ${q://QID14/ChoiceGroup/SelectedChoices} (Enter number of bulbs below)

__ # of bulbs [0-95]
-9. Prefer not to answer

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)

__ # of bulbs [0-95]
-8. Don't know
-9. Prefer not to answer

Pool and Spa

The next set of questions pertain to home pools and spas.

P1A. [SKIP IF B3=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]
-9. Prefer not to answer

P1B. [ASK IF B3=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]
-9. Prefer not to answer

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

1. Yes
2. No
-9. Prefer not to answer

P2b. [SKIP TO P3 IF P2 <> 1] Is the pool pump a high efficiency pool pump? (Check one)

1. Yes
2. No
-8. Don't know
-9. Prefer not to answer

P2c. Do you have an automatic timer that controls the time of day that your pool pump operates? (Check one)

1. Yes
2. No
-9. Prefer not to answer

P3. Do you have a pool heater? (Check one)

1. Yes
2. No [SKIP TO P4a]
-9. Prefer not to answer [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]
-8. Don't know
-9. Prefer not to answer

o_P3b. [ASK IF P3b=5] Description of other pool heater fuel.

P4a. [SKIP IF B3=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 S1]
-9. Prefer not to answer [SKIP to S1]

P4b. [ASK IF B3=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 S1]
-9. Prefer not to answer

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]
-8. Don't know
-9. Prefer not to answer

o_P5. [ASK IF P5=5] Description of other type of fuel used for hot tub heating.

Small Household Appliances

Please think about your home's small appliances or equipment for the next set of questions.

A2. How many televisions used in your home are of each of the following types? (If none, please enter zero.)

For A2a through A2d
__ # of TVs [0-20]
-5. Programming change
-8. I'm unsure what type of TV I have
-9. Prefer not to answer

A2a. Standard tube TVs
A2b. Flat screen Plasma TVs
A2c. Flat screen LCD/LED TVs
A2e. Flat screen TV of unknown type
A2d. Rear projection TVs

A3. Of the 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
-9. Prefer not to answer

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
-9. Prefer not to answer

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. Prefer not to answer

A7a.	Desktop computer (excluding monitor)
A7d.	CRT computer monitor
A7e.	LED/LCD flat screen computer monitor
A7b.	Laptop computer
A7c.	iPads, tablet computers
A7f.	eReaders such as a Kindle or Nook
A7h.	Printer
A7l.	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
-8. Don’t know
-9. Prefer not to answer

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
-8. Don't know
-9. Prefer not to answer

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
-9. Prefer not to answer

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
-9. Prefer not to answer

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

1. Yes
2. No
-9. Prefer not to answer

A11a. [Ask if A11=1] Does this household have a home-based business?

1. Yes
2. No
-9. Prefer not to answer

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

__ # of people [1-20]
-9. Prefer not to answer

o_A11bb. [Ask if A11=1] What type of business is this? (Please describe below) [RECORD RESPONSE VERBATIM]

A11c. [Ask if A11=1] 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
-9. Prefer not to answer

o_A11c. [ASK IF A11C=2] Please describe the other type of energy using equipment.

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 A12k
__ # of units [0-20]
-4. Interviewer/respondent error
-9. Prefer not to answer

A12ab.	Combination cable or satellite set-top box with DVR unit
A12a.	Cable or satellite set-top box (a set-top box is a device that converts video content to analog or digital TV signals)
A12b.	DVR (for example, TiVo)
A12c.	DVD/Blu-Ray player or recorder
A12d.	VCR
A12e.	Digital converter box
A12f.	Video gaming system (for example, PS3, PlayStation, Nintendo, XBOX, Wii)
A12g.	Home theater system
A12i.	Cell phones/Smart phones
A12j.	Cordless telephones
A12k.	Stereo system

A12n. Any other type of entertainment or telecommunications equipment?

1. Yes [SPECIFY]
2. No

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
-8. Don't know
-9. Prefer not to answer

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

These questions ask about other miscellaneous equipment you may have in your home.

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

1. Yes
2. No
-9. Prefer not to answer

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

1. Yes
2. No
-9. Prefer not to answer

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

For M4a though M4f
1. Yes
2. No
-8. Don't know
-9. Prefer not to answer

M4a. Well pump (a water well pump is a pump that is used in extracting water from a water well)
M4b. Sump pump (a sump pump is used to remove water where basement flooding may occur or above the foundation of a home)
M4c. Waterbed heater
M4d. Natural gas grill
M4e. Natural gas fire pit
M4f. Radiant floor heating separate from heating system

M5. Does anyone in your household use any other major appliances or equipment in your home that uses a lot of energy such as exercise equipment, welding equipment or heavy tools, or equipment used for a home business? (Check one)

1. Yes [SPECIFY]
2. No
-9. Prefer not to answer

*M5a. [ASK IF M5=1] Please select all the appliances or equipment that are in your home. .

For M5ac1 through M5ac16
0. Not mentioned
1. Mentioned

*M5ac1. Air compressor
*M5ac4. Exercise equipment (elliptical, treadmill, etc.)
*M5ac5. Fish tank
*M5ac7. Heating pad/blanket
*M5ac8. Musical equipment
*M5ac9. Power tools
*M5ac10. Sauna
*M5ac11. Sewing machine
*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 monitoring system? An energy monitoring 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
-9. Prefer not to answer

Internet-Enabled Devices

The next set of questions are about your home's internet-enabled devices.

I1. Do you have equipment in your home that you can control remotely by using a cell phone, tablet, computer, or smart speaker (such as Amazon Echo or Google Home)? This might include adjusting your thermostat or controlling the lighting in your home.

1. Yes
2. No
-9. Prefer not to answer

I2. [ASK IF I1=1] Which of the following can be controlled remotely? (Select all that apply)

1. Heating or cooling equipment
2. Thermostat
3. Water heating equipment
4. LEDs or "smart" light bulbs (one to three bulbs)
5. Whole house humidifying system
6. Whole house dehumidifying system
7. Pool pump
8. Security or video monitoring equipment
9. Major appliance
10. Other [SPECIFY]
-9. Prefer not to answer

I2a. [ASK IF I2=9] Which major appliances can be controlled remotely? (Select all that apply)

1. Clothes washer or dryer
2. Dishwasher
3. Cooktop, stovetop, or range
4. Stand-alone oven
5. Full-sized refrigerator
6. Stand-alone freezer
7. Other appliance [SPECIFY]

-9. Prefer not to answer

Utility Company

These questions are about your electricity bill. If you prefer not to answer them, please indicate this.

U1. Is the electric utility bill paid by someone who lives in the home, a landlord, or someone else?

1. Household member/occupant
2. Landlord
3. Homeowners Association (HOA)
4. Someone else [SPECIFY]

-8. Don't know

-9. Prefer not to answer

U2. Does your household receive financial assistance to pay a portion or all of your electric utility bill?

1. Yes
2. No

-8. Don't know

-9. Prefer not to answer

U3. [ASK IF U2=1] For what share does your household receive assistance for your electric utility bill? [SELECT ONE]

1. Less than 25%
2. Between 26% and 50%
3. Between 51% and 75%
4. Between 76% and 100%
-8. Don’t know
-9. Refused

U10. 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
10. We don’t pay electric costs because they are included in our rent or condominium fee
-8. Don’t know
-9. Prefer not to answer

The next questions are about your natural gas bill. If you prefer not to answer them, please indicate this.

U4. [ASK IF K2c2=1, K3c2=1, K4c2=1, H2=2, H7ag>=1, H8ac2=1, WH3=2, C8=2, P3b=2, OR P5=2] Is the gas bill paid by someone who lives in the home, a landlord, or someone else?

1. Household member/occupant
2. Landlord
3. Homeowners Association (HOA)
4. Someone else [SPECIFY]
-8. Don’t know
-9. Prefer not to answer

U4b. [ASK IF U4=1 AND 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. Bath Electric, Gas & Water System
2. Central Hudson Gas & Electric Corporation
3. Chautauqua Utilities, Inc.
4. Consolidated Edison Company of NY, Inc.
5. Corning Natural Gas Corporation
6. Empire State Pipeline
7. Filmore Gas Company, Inc.
8. Keyspan Energy Delivery (New York)
9. Keyspan Energy Delivery (Long Island)
10. National Fuel Gas Distribution Corporation
11. N.E.A Cross of New York, Inc.
12. New York State Electric & Gas Corporation
13. National Grid
14. Orange and Rockland Utilities, Inc.
15. Reserve Gas Company, Inc.
16. Rochester Gas Company, Inc.
17. St. Lawrence Gas Company, Inc.
18. Valley Energy, Inc.
19. Woodhull Municipal Gas Company
20. Other [SPECIFY]
-8. Don’t know
-9. Prefer not to answer

o_U4b. [ASK IF U4b=56] Specify other gas utility.

U5. [ASK IF U4=1 AND K2c2=1, K3c2=1, K4c2=1, H2=2, H7ag>=1, H8ac2=1, WH3=2, C8=2, P3b=2, OR P5=2] Does your household receive financial assistance to pay a portion or all of your gas bill?

1. Yes
2. No
-8. Don’t know
-9. Prefer not to answer

U6. [ASK IF U5=1] For what share does your household receive assistance? (Select one)

1. Less than 25%
2. Between 26% and 50%
3. Between 51% and 75%
4. Between 76% and 100%
-8. Don't know
-9. Refused

U8. [ASK IF (B3=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
-9. Prefer not to answer

U9. [ASK IF (B3=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
-9. Prefer not to answer

U11. Please provide your best estimate of the total natural gas costs your home paid in the last 12 months. Do not include electricity 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
10. We don't pay natural gas costs because they are included in our rent or condominium fee
-8. Don't know
-9. Prefer not to answer

U12. Please provide your best estimate of the total costs for all fuel types your home paid in the last 12 months. Please include all types of fuel. (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
10. We don’t pay any fuel costs because they are included in our rent or condominium fee

-8. Don’t know
-9. Prefer not to answer

U13. Energy bill assistance and weatherization assistance are available based on income criteria. Do you qualify for this or any other kind of assistance?

1. Yes
2. No

-8. Don’t know
-9. Prefer not to answer

Energy Efficiency

These questions are about energy efficiency upgrades or improvements to your home.

F1. In the last five years, has your household made any energy-related home improvements such as upgrading thermostats or home insulation, or installed more efficient appliances or more efficient heating and cooling systems?

1. Yes
2. No

-9. Prefer not to answer

F1a. [ASK IF F1=1] What were your reasons for making these energy-related improvements? [RECORD ALL THAT APPLY]

1. Use less energy
2. Save money on utility bills
3. Make home more comfortable
4. Install better/brighter lighting
5. Save money on maintenance costs
6. Receive an incentive or rebate
7. Protect the environment
8. Other [SPECIFY]

-9. Prefer not to answer

F2. 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. Prefer not to answer

F3. [ASK IF F2=1] What type of equipment did you install or recycle through a program? (Select all that apply)

For F3c1 through F3c9

0. Not mentioned
1. Mentioned

-9. Prefer not to answer

F3c1. Insulation or weatherization measures
F3c2. Heating equipment
F3c3. Air conditioning equipment
F3c4. Lighting
F3c5. Water heating equipment
F3c6. Clothes washer
F3c7. Appliances
F3c8. Refrigerator or freezer recycling
F3c9. Other [SPECIFY]

F4. [ASK IF F2=1] Did you receive a tax credit for any of these improvements?

1. Yes
2. No

-9. Prefer not to answer

F5. [ASK IF F4=1] Was it a federal, state, or local tax credit?

1. Federal
2. State
3. Local
4. Other [SPECIFY]
-8. Don't know
-9. Prefer not to answer

F6. [ASK IF F2=2] What do you think are the challenges with participating in energy efficiency programs? (Select all that apply)

For F6c1 through F6c9
0. Not mentioned
1. Mentioned
-9. Prefer not to answer

F6c1. Am not aware of any energy efficiency programs
F6c2. Home does not need energy efficient improvements
F6c3. Don't know who to contact about programs
F6c4. Cannot afford to make home improvements
F6c5. My energy bills are not that high
F6c6. I rent and cannot make upgrades
F6c7. Other [SPECIFY]
F6c8. Too busy to make home improvements
F6c9. Recently moved into the home

o_F6. [ASK IF F6c7=1] Description of other reason why household hasn't participated.

F7. Are you considering replacing or purchasing any of the following in the next five years? (Select all that apply)

For F7c1 through F7c7
0. Not mentioned
1. Mentioned
-9. Prefer not to answer

F7c1. Insulation or weatherization measures
F7c2. Heating equipment
F7c3. Air conditioning equipment
F7c4. Water heating equipment
F7c5. Clothes washer
F7c6. Appliances
F7c7. None of the above

F8. 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 F8c1 through F8c7
0. Not mentioned
1. Mentioned
-9. Prefer not to answer

F8c1. Insulation or weatherization measures
F8c2. Heating equipment
F8c3. Air conditioning equipment
F8c4. Water heating equipment
F8c5. Clothes washer
F8c6. Appliances
F8c7. None of the above

F9. How much do you agree or disagree with the statement, “My home is as energy efficient as it could be.”

1. Strongly agree
2. Somewhat agree
3. Neither agree nor disagree
4. Somewhat disagree
5. Strongly disagree
-9. Prefer not to answer

F9a. [ASK IF F9=1-5] Why do you [INSERT REPSONSE FROM F7] with this statement? [RECORD RESPONSE]

F10. [ASK IF B7=14-17 (2015-2018)] When purchasing or building your new home, how important was energy efficiency in your decision?

1. Very important
2. Somewhat important
3. Not too important
4. Not at all important
5. Don't know
6. Prefer not to answer

F11. [ASK IF B7=14-17 (2015-2018)] Thinking about the insulation in your home, does it… [SELECT ONE]

1. Exceed values required by code
2. Meet values required by code
3. Not meet values required by code
4. Don't know
5. Prefer not to answer

Purchase Decisions

It sometimes costs more to purchase energy-efficient products compared to standard products. The next questions ask you about some ways you could save energy in your home.

[RANDOMIZE THE BLOCKS OF QUESTIONS and insert a page break between each block]

LED

[Persistent or intro text for LED block]

LED is short for Light Emitting Diode, which is a type of energy-saving light. A 10 Watt LED gives the same amount of light as a traditional 60W incandescent bulb, costs about $2 more than a less-efficient bulb, and often saves $2 to $6 annually in energy costs.

W1. How likely are you to install energy-efficient LED light bulbs in the next five years?

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely
5. I have LEDs in every light fixture and socket in my home already

-8. Don't know
-9. Prefer not to answer

[ASK IF W1=2-4]

Suppose the cost of an energy-efficient LED light bulb is $2 more than a standard light bulb and might save $2 to $6 per year in energy costs. Please indicate how likely you would be to upgrade to an energy-efficient, LED light bulb in the next five years if you received an incentive of ...

W2. About **$0.50 per bulb** or **25%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W3. [ASK IF W2=2-4] About **$1 per bulb** or **50%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W4. [ASK IF W3=2-4] About **$1.50 per bulb** or **75%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W5. [ASK IF W4=2-4] **$2 per light bulb** or **100%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

Central A/C

[ASK ONLY IF PARTICIPANTS HAVE CENTRAL A/C (H11=1)]

[Persistent or intro text for Central A/C block]

Energy-efficient central air conditioning units, such as models with an efficiency rating of 16 SEER, cost roughly $1,500 more than standard 13 SEER models and often save $30 to $100 a year in energy costs in New York State.

W6. Assume your home's central air conditioning unit will need to be replaced within five years. How likely would you be to replace that unit with an **energy-efficient central air conditioner** in the next five years?

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely
5. I already have the most efficient central air conditioning system available

-8. Don't know
-9. Prefer not to answer

[ASK IF W6=2-4]

Suppose the cost of an **energy-efficient central air-conditioner** is $1,500 more than a standard central air-conditioner and would save $30 to $100 a year in energy costs. Please indicate how likely you would be to upgrade to an **energy-efficient central air-conditioner** in the next five years if you received an incentive of …

W7. About **$375** or **25%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W8. [ASK IF W7=2-4] About **$750** or **50%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W9. [ASK IF W8=2-4] [ASK **IF** W7**=2-4]** About $750 or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W10. [ASK IF W9=2-4] **$1,500** or **100%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

[Persistent or intro text for Heating equipment block]

Energy-efficient heating equipment costs more than standard equipment but reduces energy usage. For example, an energy-efficient gas furnace with an energy efficiency rating of 95% costs roughly $1,500 more than standard 80% efficiency rated model and often saves $110 to $180 a year in energy costs in New York State.

W11. Assume your home has a gas furnace or other heating equipment that will need to be replaced within five years. How likely would you be to upgrade to **energy-efficient heating equipment** in the next five years?

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely
5. I already have the most energy-efficient heating system available
-8. Don't know
-9. Prefer not to answer

[ASK IF W11=2-4]

Suppose the cost of **energy-efficient heating equipment** is $1,500 more than standard equipment and might save $110 to $180 a year in energy costs. Please indicate how likely you would be to upgrade to **energy-efficient heating equipment** in the next five years if you received an incentive of …

W12. About **$375** or **25%** of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W13. [ASK IF W12=2-4] About $750 or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W14. [ASK IF W13=2-4] [ASK IF W7=2-4] About $750 or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W15. [ASK IF W14=2-4] $1,500 or 100% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

Appliances

[PERSISTENT OR INTRO TEXT FOR APPLIANCES BLOCK]

Energy-efficient appliances cost more than standard models but provide significant energy savings. For example, an energy-efficient ENERGY STAR [PROGRAMMING NOTE: SEQUENTIALLY SELECT FROM: (**refrigerator, dishwasher, clothes washer, or clothes dryer)]** costs roughly $50 more than a standard model and might save $8 to $12 a year in energy costs.

[PROGRAMMING NOTE: APPLIANCE SELECTED SHOULD BE STORED IN A DATA FIELD CALLED “APPLIANCE”. ONLY SELECT ONE APPLIANCE PER SURVEY. ROTATE THE SELECTION.]

W16. Assume your home’s [APPLIANCE] will need to be replaced within five years. How likely would you be to replace it with an energy-efficient, ENERGY STAR model in the next five years?

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely
-8. Don’t know
-9. Prefer not to answer

[ask if W16=2-4]

Suppose the cost of an energy-efficient [APPLIANCE] is $50 more than a standard [APPLIANCE] and might save $8 to $12 a year in energy costs. Please indicate how likely you would be to upgrade to an energy-efficient [APPLIANCE] in the next five years if you received an incentive of …

W17. About $13 or 25% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don’t know (-8)	Prefer not to answer (-9)

W18. [ASK IF W17=2-4] About $25 or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don’t know (-8)	Prefer not to answer (-9)

W19. [ASK IF W18=2-4] [ASK IF W7=2-4] About $750 or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don’t know (-8)	Prefer not to answer (-9)

W20. [ASK IF W19=2-4] $50 or 100% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don’t know (-8)	Prefer not to answer (-9)

Water Heater

[ASK IF WH3=1 (PRIMARY FUEL FOR HWH IS ELECTRICITY)

[Persistent or intro text for water heater block]

Energy-efficient water heaters cost more than standard models but offer significant energy savings. For example, a 50-gallon energy efficient ENERGY STAR heat pump water heater costs roughly $750 more than a conventional electric water heater and might save $330 to $370

a year in energy costs.

W21. Assume your home's water heater will need to be replaced within five years. How likely would you be to upgrade to an energy-efficient, **ENERGY STAR heat pump water heater** in the next five years?

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely
5. I already have the most energy-efficient water heating system available
-8. Don't know
-9. Prefer not to answer

[ASK IF W21=2-4]

Suppose the cost of an **energy-efficient, ENERGY STAR heat pump water heater** is $750 more than a standard water heater and might save $330 to $370 a year in energy costs. Please indicate how likely you would be to upgrade to an **energy-efficient, ENERGY STAR heat pump water heater** in the next five years if you received an incentive of ...

W22. About $185 or 25% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W23. [ASK IF W22=2-4] About $375 or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W24. [ASK IF W23=2-4] About $560 or 75% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W25. [ASK IF W24=2-4] $750 or 100% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

Weatherization Measures

[ASK IF B1=1 (OWN HOME)]

[Persistent or intro text for weatherization measures]

Weatherizing your home by improving insulation, reducing air leakage, and installing windows often improves comfort and lowers energy bills. The cost and the savings depend on many

factors, including how much insulation you start with, what type of heating system you use, and how much you heat and cool your home.

W26. Assume that **improving air sealing and insulation** in your attic would cost $2,000 and save about $200 a year in heating and cooling costs. How likely would you be to make this improvement in the next five years?

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely
5. I don't have an attic
-8. Don't know
-9. Prefer not to answer

[ASK IF W26=2-4]

Suppose the cost to weatherize your home by improving air sealing and insulation in your home's attic was $2,000, please indicate how likely you would be to weatherize your home in the next five years if you received an incentive of ...

W27. About $500 or 25% of the initial cost to improve air sealing and insulation in your home's attic?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W28. [ASK IF W27=2-4] About $1,000 or 50% of the initial cost to improve air sealing and insulation in your home's attic?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W29. [ASK IF W28=2-4] About $1,500 or 75% of the initial cost to improve air sealing and insulation in your home's attic?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W30. [ASK IF W29=2-4] $2,000 or the full cost to improve air sealing and insulation in your home's attic?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

Fuel Conversion/Electrification

[ASK IF B1 = 1]

Assume that your current space heating system uses natural gas or other non-electric heating fuel and that it will fail in the next five years. Converting to an electric heating source such as an air-source heat pump, ductless mini-split heat pump, or ground-source heat pump would cost between $1,000 and $3,000 more than simply replacing the old system. This conversion may decrease your natural gas or other non-electric heating fuel bill and may increase your electric bill while creating a more environmentally-friendly, energy-efficient home heating system.

W31. Given the cost of converting, how likely would you be to convert to electric space heating for your home in the next five years?

1. Very likely
2. Somewhat likely
3. Not too likely
4. Not at all likely
5. Already have it/have done it
-8. Don't know
-9. Refused

[ASK IF 0=2-4]

Suppose the cost of converting to an electric air-source heat pump, ductless mini-split, or ground-source heat pump is $1,000 to $3,000 more than standard electric heating system. Please indicate how likely you would be to upgrade to one of these heat pump **heating and cooling systems** in the next five years if you received an incentive of …

W32. Between $250 and $750, or 25% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W33. [ASK IF W32=2-4] Between $500 and $1,500, or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W34. [ASK IF W33=2-4] [ASK IF W7=2-4] About $750 or 50% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

W35. [ASK IF W34=2-4] Between $1,000 and $3,000, or 100% of the difference in cost?

Very likely (1)	Somewhat likely (2)	Not too likely (3)	Not at all likely (4)	Don't know (-8)	Prefer not to answer (-9)

Demographics

Last, we have a few demographic questions about your household. If you prefer not to answer, please indicate this.

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 to the extent permitted by law. 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]
-9. Prefer not to answer

D2_5. Less than 5 years old
D2_6. 6-17 years old
D2_18. 18-24 years old
D2_25. 25-34 years old
D2_35. 35-44 years old
D2_45. 45-54 years old
D2_55. 55-64 years old
D2_65. 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. Master's or Doctorate degree)
-9. Prefer not to answer

D4. For classification purposes only, which of the following best describes your household's total income in 2017? (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

-9. Prefer not to answer

D5. What is your gender?

1. Male
2. Female

-9. Prefer not to answer

D7. NYSERDA is offering select households an additional $100 electronic Amazon 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 to three 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 home site visit for an additional $100 electronic Amazon gift card? This would be for your home at [SERVICE ADDRESS]. (Check one)

1. Yes
2. Possibly, but I need more information
3. No

-9. Prefer not to answer

D8. [ASK IF D7=1 OR 2] Please provide your contact information and address so we can have someone call you to schedule a home site visit. The fields in red are required to schedule your home site visit.

D8. First and Last name of person to ask for
D8b. Address
Apartment or unit number
D8c. City
D8h. State
D8d. ZIP Code (enter 5-digit ZIP code)
D8e. Main telephone number (XXX) XXX-XXXX
D8f. Secondary telephone number (XXX) XXX-XXXX
D8g. Email

D9. You will receive your $20 Amazon gift card through your email address. To ensure your $20 gift card arrives please enter your email address.

1. [ENTER EMAIL ADDRESS]
2. Do not have an email address or want the card mailed to my home
3. Do not want a gift card [SKIP TO D10]

D9a. [ASK IF D9=1 AND D7=3 OR -9] Thank you. In case there are delivery problems, please provide a phone number where you can be reached and your name.

[ENTER PHONE NUMBER] (XXX) XXX-XXXX
[ENTER NAME]

Thank you. Your Amazon gift card, valued at $20, will be emailed to you within two weeks. If you have any questions or problems, please contact Amanda McLeod by emailing Amanda.McLeod@CadmusGroup.com or calling (617) 673-7115. [SKIP TO D10]

D9AA. [ASK IF D9=1 AND D7=1] Thank you. Your Amazon gift card, valued at $20, will be emailed to you within two weeks. If you have any questions or problems, please contact Amanda McLeod by emailing Amanda.McLeod@CadmusGroup.com or calling (617) 673-7115.

D9b. [ASK IF D9=2 AND D7=3 OR -9] Please enter your mailing address and a telephone number in case there are any delivery problems.

D9c. Name
D9d. Street Address
Apartment or unit number
D9e. City
D9f. State
D9g. ZIP code (enter 5-digit ZIP code)
D9h. Phone number(XXX) XXX-XXXX

D9h. [ASK IF D9=2] Thank you. Your Amazon gift card, valued at $20, will be mailed to you within three weeks. If you have any questions or problems, please contact Amanda McLeod by emailing Amanda.McLeod@CadmusGroup.com or calling (617) 673-7115.

D10. 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
-9. Prefer not to answer

D11. Thank you for your help with this important study. Do you have any additional comments that you would like to share?

1. Yes [SPECIFY]
2. No comment [END SURVEY]
-9. Prefer not to answer

o_D11.[ASK IF D11=1] Comments from the respondent [END SURVEY]

[OVER-QUOTA CLOSE] Thank you for your interest in the NYSERDA Residential Building Stock Assessment 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.nyserda.ny.gov/2018-RBSA

Attempted survey after region closed [END SURVEY]

[FOR PEOPLE WHO COMPLETE SURVEY] Thank you for your completing this survey. For more information on this important study or information on energy efficiency programs in your area, please visit http://www.nyserda.ny.gov/2018-RBSA.