



NYSERDA

NYSERDA Residential Statewide Baseline Study

Volume 5: Methodology and Data Tables

Final Report

NYSERDA's Promise to New Yorkers:

NYSERDA provides resources, expertise, and objective information so New Yorkers can make confident, informed energy decisions.

Mission Statement:

Advance innovative energy solutions in ways that improve New York's economy and environment.

Vision Statement:

Serve as a catalyst – advancing energy innovation, technology, and investment; transforming New York's economy; and empowering people to choose clean and efficient energy as part of their everyday lives.

NYSERDA Residential Statewide Baseline Study

Volume 5: Methodology and Data Tables

Final Report

Prepared for:

New York State Energy Research and Development Authority

Albany, NY

Carley Murray

Associate Project Manager

Jonathon Steiner

Assistant Project Manager

Prepared by:

Tetra Tech

Carol Sabo, Pam Rathbun, Mandy Pom, and Lisa Stefanik

GDS Associates

Scott Albert

PSD

Susan Mann

Notice

This report was prepared by Tetra Tech MA, Inc. (TetraTech) and its subcontractors Performance Systmes Development(PSD), GDS Associates, Inc.(GDS), 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.

Abstract for Volume 5

Volume 5 includes the methodology and data tables for the entire Residential Statewide Baseline study. This Volume 5 includes the methodology, data comparisons and data weighting for the single-family home baseline (Volume 1), multifamily baseline (Volume 2), and HVAC Market Assessment (Volume 3). This volume contains a high-level summary of the data collected in the Residential Statewide Baseline study. The intention of providing this data is to enable readers to appraise these additional data independently of the report volumes that comprise this study. The data consist of (1) the quantitative data from the study telephone and Web surveys, and (2) a summary of the quantitative and qualitative data collected during the on-site inspections. The data are presented in table format with brief explanations of the survey instrument, question and respondent type.

Keywords

Energy efficiency, baseline study, residential, methodology, data tables

Acknowledgements

The Tetra Tech evaluation team thanks Carley Murray, Jonathon Steiner, and Jennifer Meissner of NYSERDA for the leadership, guidance, critical review, and assistance they provided throughout the residential baseline study. The team would also like to thank the Performance Systems Development (PSD) team (led by Susan Mann) for the development, oversight, and implementation of the robust on-site data collection at single family buildings throughout New York State and GDS Associates (led by Scott Albert) that managed the multifamily on-site data collection efforts and the development of the potential study component. Finally, this was a collaborative effort with many parties providing advice and review throughout the process, including Bill Saxonis from the New York State Department of Public Service, E2 Working Group, NYSERDA program staff, and evaluation consultants. Tetra Tech would also like to recognize utility staff members who provided the electric utility account information and samples necessary to ensure that the study sample is representative at the statewide level.

Table of Contents

Notice.....	ii
Abstract for Volume 5.....	iii
Keywords.....	iii
Acknowledgements	iii
List of Figures	v
List of Tables.....	vi
1 Project Summary	1
1.1 Background and Study Objectives.....	1
1.1 Market Segment Definitions.....	3
1.2 Project Team.....	4
1.3 Overview of the Baseline Study Approach.....	5
1.4 Summary of Data Collection Activities	8
1.5 Data Weighting.....	9
1.6 Comparison of Weighted Data to Other Data Sources.....	9
1.7 Statistical Confidence and Precision.....	12
2 Single Family and Tenant Survey	14
2.1 Summary of Approach	14
2.2 Sampling Strategy.....	15
2.3 Response Rates.....	19
2.4 Weighting	22
2.5 Data Limitations and Suggestions for Future Studies.....	24
3 Single Family On-site Data Collection	27
3.1 Summary of Approach	27
3.2 Sampling Strategy.....	29
3.3 Response Rates.....	30
3.4 Weighting	34
3.5 Data Limitations and Suggestions for Future Studies for On-site Data Collection	35
4 Multifamily Property Manager or Owner Surveys	38
4.1 Objectives.....	38
4.2 Sampling Strategy.....	38
4.3 Response Rates.....	40
4.4 Weighting	42
4.5 Data Limitations and Suggestions for Future Studies.....	42

5	Multifamily On-site Data Collection	44
5.1	Summary of Approach	44
5.2	Sampling Strategy	45
5.3	Response Rates	47
5.4	Weighting	48
5.5	Data Limitations and Suggestions for Future Studies	49
5.6	Other Lessons Learned	49
5.6.1	Recruitment Lessons	49
5.6.2	Data Collection	51
6	HVAC Contractor Surveys	53
6.1	Objective	53
6.2	Sampling Strategy	54
6.3	Response Rates	57
6.4	Weighting	59
6.5	Data Limitations and Suggestions for Future Studies	59
7	Data Tables from Telephone and Web Surveys and On-site Inspections	61
	Appendix A: All Survey Instruments	A-1
	Appendix B: Sample Letters for All Data Collection Activities	B-1
	Appendix C: Screen Shots of the On-site Data Collection Tool*	C-1

List of Figures

Figure 1. Key Staff	4
Figure 2. New York State Climate Zone Map	5
Figure 3. Project Flowchart	7
Figure 4. New York Economic Development Regions	17
Figure 5. Distribution of Residential Electric Accounts by Economic Development Region in New York	18
Figure 6. Data Release Authorization Form	1
Figure 7. Single Family and Tenant Survey Postal Mail Invite	2
Figure 8. Single Family and Tenant Survey Postal Mail Invite	3
Figure 9. Single Family On-site Inspection Recruitment Postal Mail Letter	4
Figure 10. HVAC Email to Contractors	5
Figure 11. HVAC Table of Equipment to Contractors	6
Figure 12. HVAC Table of Equipment to Contractors (Continued)	7

List of Tables

Table 1. New York State Climate Zone by County	6
Table 2. Overview of Data Collection Activities	8
Table 3. Single Family Survey Completes by Method	20
Table 4. Tenant Survey Completes by Method.....	20
Table 5. Single Family and Tenant Telephone and Web Survey Disposition and Response Rate*	21
Table 6. Single Family and Tenant Survey Weights: New Construction	24
Table 7. Single Family and Tenant Survey Weights: Existing Construction	24
Table 8. Disposition of Single Family On-Site Inspection Sample by Region.....	31
Table 9. Single Family Completions by Region	32
Table 10. Single-Family Survey or On-site Inspection Completes by Construction Type and Climate Zone	33
Table 11. Single-Family On-site Inspection Weights	34
Table 12. Original Time Estimates for Existing and New Homes	37
Table 13. Property Manager or Owner Survey Completes by Region	39
Table 14. Multifamily Property Owner or Manager Surveys and On-site Inspections by Construction Type and Climate Zone	39
Table 15. Property Owner or Manager Survey Response Rate	41
Table 16. Property Owner or Manager Survey Weights	42
Table 17. Multifamily Property Surveys and Recruitment for On-site Inspections, Targets, and Completed On-site Inspections.....	47
Table 18. Number of Buildings Pursued by Source of Lead	48
Table 19. Population of HVAC Contractors in New York State	55
Table 20. Total Sample Count and Ineligible Subset Count by Climate Zone	56
Table 21. HVAC Contractor Calling (September 2014) Response Rates	58
Table 22. Statewide: Household Members Work Primarily from Home by Climate Zone	61
Table 23. Household Members Work Primarily from Home by Construction Type.....	61
Table 24. Statewide: Number of Household Members by Age by Climate Zone.....	62
Table 25. Number of Household Members by Age by Construction Type.....	63
Table 26. Statewide: Highest Level of Education by Climate Zone.....	64
Table 27. Highest Level of Education by Construction type.....	64
Table 28. Annual Household Income by Construction Type	65
Table 29. Statewide: Number of Stories by Climate Zone	65
Table 30. Number of Stories by Construction Type	65
Table 31. Statewide: Retail Space in Building by Climate Zone	66
Table 32. Statewide: Major Renovation in Past Five Years by Climate Zone	66
Table 33. Statewide: More than one Electric Meter at Address by Climate Zone.....	66
Table 34. Statewide: Electric Utility Provider by Climate Zone	67
Table 35. Statewide: Natural Gas Provider by Climate Zone.....	67
Table 36. Natural Gas Provider by Construction Type.....	69
Table 37. Statewide: Who Pays for Natural Gas by Climate Zone.....	70
Table 38. Who Pays for Natural Gas by Construction Type.....	70

Table 39. Statewide: Natural Gas Available on Street by Climate Zone	71
Table 40. Natural Gas Available on Street by Construction Type	71
Table 41. Interested in Converting to Natural Gas by Construction Type	71
Table 42. Statewide: Average Number of Fireplaces by Climate Zone	72
Table 43. Average Number of Fireplaces by Construction Type	72
Table 44. Statewide: Heating System ENERGY STAR Rated by Climate Zone	72
Table 45. Heating System ENERGY STAR Rated by Construction Type	73
Table 46. Statewide: Average Number of Other Heating Sources by Climate Zone	73
Table 47. Average Number of Other Heating Sources by Construction Type	73
Table 48. Statewide: Average Room or Window Air Conditioners by Climate Zone	74
Table 49. Average Room or Window Air Conditioners by Construction Type	74
Table 50. Statewide: Average Ventilation Equipment by Climate Zone	74
Table 51. Average Ventilation Equipment by Construction Type	75
Table 52. Statewide: Presence of Programmable Thermostat by Climate Zone	75
Table 53. Presence of Programmable Thermostat by Construction Type	76
Table 54. Statewide: Presence of Programmable Thermostat by Fuel Type	76
Table 55. Statewide: Type of Water Heating System by Climate Zone	77
Table 56. Type of Water Heating System by Construction Type	77
Table 57. Statewide: Type of Water Heating System by Water Heater Fuel	78
Table 58. Statewide: Age of Primary Water Heating System by Climate Zone	78
Table 59. Age of Primary Water Heating System by Construction Type	79
Table 60. Statewide: Age of Primary Water Heating System by Water Heater Type	79
Table 61. Statewide: Primary Water Heater ENERGY STAR Rated by Climate Zone	80
Table 62. Primary Water Heater ENERGY STAR Rated by Construction Type	80
Table 63. Existing Construction: Water Heating Fuel by Climate Zone	80
Table 64. Statewide: Water heater Year of Manufacture from On-site Inspections	81
Table 65. Statewide: Use Supplemental Water Heating System by Climate Zone	82
Table 66. Statewide: Use Supplemental Water Heating System by Climate Zone	82
Table 67. Statewide: Clothes Washer ENERGY STAR by Climate Zone	82
Table 68. Statewide: Age of Primary Clothes Washer by Climate Zone	83
Table 69. Statewide: Water Temperature for Wash Cycle of Clothes Washer by Climate Zone	83
Table 70. Statewide: Water Temperature for Rinse Cycle of Clothes Washer by Climate Zone	83
Table 71. Statewide: Average Clothes Dryer Year of Manufacturer per Household by Climate Zone	84
Table 72. Statewide: Average Loads of Clothes Dried per Week by Climate Zone	84
Table 73. Statewide: Primary Clothes Dryer Fuel by Climate Zone	84
Table 74. Statewide: Age of Clothes Dryer by Climate Zone	85
Table 75. Statewide: Age of Primary Refrigerator by Climate Zone	85
Table 76. Statewide: Refrigerator ENERGY STAR by Climate Zone	85
Table 77. Statewide: Style of Home by Climate Zone	86
Table 78. Style of Home by Construction Type	87
Table 79. Statewide: Type of Garage by Climate Zone	88

Table 80. Type of Garage by Construction Type	88
Table 81. Statewide: Garage Finish by Climate Zone.....	89
Table 82. Garage Finish by Construction Type	89
Table 83. Statewide: If Attached Garage, Visual Inspection of Connectivity - Boundary Wall	90
Table 84. Statewide: If Attached Garage, Visual Inspection of Connectivity - Boundary Wall	90
Table 85. Statewide: If Attached Garage, Visual Inspection of Connectivity - Boundary Wall	90
Table 86. If Attached Garage, Visual Inspection of Connectivity - Boundary Wall by Construction Type	91
Table 87. Statewide: If Attached Garage, Visual Inspection of Connectivity - Duct Work by Climate Zone	91
Table 88. If Attached Garage, Visual Inspection of Connectivity - Duct Work by Construction Type	92
Table 89. Statewide: Foundation Type by Climate Zone	92
Table 90. Foundation Type by Construction Type	93
Table 91. Statewide: Ceiling Type by Climate Zone	93
Table 92. Ceiling Type by Construction Type	94
Table 93. Statewide: Percent of Foundation Insulated by Age of Home	94
Table 94. Statewide: Grade of Foundation Insulation Type	96
Table 95. Existing Construction: Grade of Foundation Insulation Type	97
Table 96. New Construction: Grade of Foundation Insulation Type	97
Table 97. Statewide: Exterior Foundation Insulation Type.....	98
Table 98. Exterior Foundation Insulation Type by Construction Type	98
Table 99. Existing Construction: Grade of Floor Insulation	99
Table 100. New Construction: Grade of Floor Insulation	99
Table 101. Statewide: Grade of Continuous Floor Insulation Type	100
Table 102. Existing Construction: Grade of Continuous Floor Insulation Type	100
Table 103. New Construction: Grade of Continuous Floor Insulation Type.....	101
Table 104. New Construction: Grade of Floor Insulation Type	101
Table 105. Statewide: Floor Insulation Thickness by Climate Zone.....	102
Table 106. Existing Construction: Floor Insulation Thickness by Climate Zone	102
Table 107. New Construction: Floor Insulation Thickness by Climate Zone	103
Table 108. Existing Construction: Wall Insulation Type by Climate Zone	103
Table 109. Statewide: Wall Insulation Thickness by Climate Zone	104
Table 110. Existing Construction: Wall Insulation Thickness	105
Table 111. New Construction: Wall Insulation Thickness by Climate Zone.....	106
Table 112. Statewide: Wall Insulation Framing and Grade	107
Table 113. Statewide: Ceiling Insulation Thickness by Climate Zone	108
Table 114. Existing Construction: Ceiling Insulation Thickness	109
Table 115. New Construction: Ceiling Insulation Thickness	110
Table 116. Statewide: Ceiling Insulation Type by Climate Zone	111
Table 117. Existing Construction: Ceiling Insulation Type by Climate Zone	112
Table 118. New Construction: Ceiling Insulation Type by Climate Zone.....	113
Table 119. Statewide: Duct System Type Served by Climate Zone.....	113
Table 120. Statewide: Grade of Continuous Floor Insulation by Climate Zone	114

Table 121. Existing Construction: Grade of Continuous Floor Insulation	114
Table 122. New Construction: Grade of Continuous Floor Insulation	114
Table 123. Statewide: Wall Insulation Quality by Climate Zone	115
Table 124. Existing Construction: Wall Insulation Quality	115
Table 125. New Construction: Wall Insulation Quality	115
Table 126. New Construction: Grade of Floor Insulation Type	116
Table 127. Statewide: RimBand Insulation Type by Climate Zone	116
Table 128. Existing Construction: RimBand Insulation Type	117
Table 129. New Construction: RimBand Insulation Type by Climate Zone	117
Table 130. Statewide: RimBand Insulation Quality by Climate Zone	118
Table 131. Existing Construction: RimBand Insulation Quality by Climate Zone.....	118
Table 132. New Construction: RimBand Insulation Quality by Climate Zone.....	118
Table 133. Statewide: Ceiling Insulation Quality by Climate Zone	119
Table 134. Existing Construction: Ceiling Insulation Quality by Climate Zone	119
Table 135. New Construction: Ceiling Insulation Quality by Climate Zone.....	119
Table 136. Statewide: Presence of Bay Windows by Climate Zone.....	120
Table 137. Existing Construction Presence of Bay Windows by Climate Zone	120
Table 138. New Construction: Presence of Bay Windows	120
Table 139. Statewide: Presence of Window Glazing by Climate Zone	121
Table 140. Existing Construction: Presence of Window Glazing by Climate Zone.....	121
Table 141. New Construction: Presence of Window Glazing by Climate Zone	122
Table 142. Statewide: Window Condition by Climate Zone	122
Table 143. Existing Construction: Window Condition by Climate Zone.....	123
Table 144. New Construction: Window Condition by Climate Zone	123
Table 145. Statewide: Type of Window Frame by Climate Zone	124
Table 146. Existing Construction: Type of Window Frame by Climate Zone.....	124
Table 147. Presence of Storm Window by Age of Home	125
Table 148. Existing Construction: Presence of Storm Window by Age of Home.....	125
Table 149. New Construction: Presence of Storm Window by Age of Home	126
Table 150. Statewide: Average Window Size by Climate Zone	126
Table 151. Average Window Size by Construction Type	126
Table 152. Statewide: Average Number of Windows by Climate Zone	127
Table 153. Average Number of Windows by Construction Type.....	127
Table 154. Statewide: Average U-factor of Windows by Climate Zone	127
Table 155. Average U-factor of Windows by Construction Type.....	128
Table 156. Statewide: Door Material by Climate Zone.....	128
Table 157. Existing Construction: Door Material by Climate Zone	129
Table 158. New Construction: Door Material by Climate Zone	129
Table 159. Statewide: HVAC Cooling Location by Climate Zone.....	130
Table 160. HVAC Cooling Location by Construction Type	130
Table 161. Statewide: HVAC Cooling Location by Heating System Type	130
Table 162. Statewide: Percentage of Conditioned Space by Climate Zone	131
Table 163. Percentage of Conditioned Space by Construction Type.....	131
Table 164. Statewide: Air Filter Condition by Climate Zone.....	132

Table 165. Air Filter Condition by Construction Type	132
Table 166. Statewide: Year Cooling System Last Serviced by Climate Zone	133
Table 167. Year Cooling System Last Serviced by Construction Type	134
Table 168. Statewide: Year Cooling System Last Serviced by Year of Manufacturer	135
Table 169. Statewide: Year Cooling System Last Serviced by System Type.....	136
Table 170. Statewide: Room/Window Air Conditioner Energy Efficiency Ratio by Climate Zone	137
Table 171. Statewide: Air Filter Condition by Cooling System Type	137
Table 172. Statewide: Air Filter Condition by Cooling System Age.....	138
Table 173. Statewide: Cooling System Condition by Climate Zone	138
Table 174. Cooling System Condition by Construction Type	138
Table 175. Statewide: Cooling System Condition by System Type.....	139
Table 176. Statewide: Cooling System Condition by System Age	139
Table 177. Statewide: Duct System Type Served by Climate Zone.....	139
Table 178. Duct System Type Served by Construction Type.....	140
Table 179. Statewide: Percentage of Duct Distribution in Unconditioned Space by Climate Zone	140
Table 180. Statewide: Percentage of Duct Distribution in Unconditioned Space Insulated by Climate Zone	141
Table 181. Statewide: Duct Insulation Type in Unconditioned Space by Climate Zone	141
Table 182. Statewide: Duct Type in Unconditioned Space by Climate Zone	142
Table 183. Statewide: Clothes Washer Type by Climate Zone.....	142
Table 184. Statewide: Clothes Washer Age Categories per Household by Climate Zone	142
Table 185. Statewide: Clothes Washer Age by Climate Zone	143
Table 186. Statewide: Average Number of Loads/Cycles per Week by Climate Zone	143
Table 187. Statewide: Average Loads of Clothes Washed per Week by Climate Zone	143
Table 188. Statewide: Clothes Dryer Type by Climate Zone	144
Table 189. Statewide: Clothes Dryer Age by Climate Zone.....	144
Table 190. Statewide: Refrigerator Age by Climate Zone.....	145
Table 191. Statewide: Average Refrigerator Size per Household by Climate Zone	145
Table 192. Statewide: Freezer Age by Climate Zone	145
Table 193. Statewide: Freezer ENERGY STAR® by Climate Zone.....	146
Table 194. Statewide: Dishwasher ENERGY STAR by Climate Zone	146
Table 195. Statewide: Wine Cooler Age by Climate Zone	146
Table 196. Statewide: Wine Cooler ENERGY STAR by Climate Zone	147
Table 197. Statewide: Humidifier Age by Climate Zone.....	147
Table 198. Statewide: Humidifier Usage by Climate Zone.....	147
Table 199. Statewide: Humidifier ENERGY STAR by Climate Zone.....	148
Table 200. Statewide: Dehumidifier Age by Climate Zone.....	148
Table 201. Statewide: Average Dehumidifier Year of Manufacturer per Household by Climate Zone	148
Table 202. Statewide: Dehumidifier ENERGY STAR by Climate Zone.....	149
Table 203. Statewide: Pool in Ground by Climate Zone	149
Table 204. Statewide: Hot Tub in Ground by Climate Zone.....	149

Table 205. Statewide: Hot Tub Heated by Climate Zone	150
Table 206. Statewide: Hot Tub Pump High Efficiency by Climate Zone.....	150
Table 207. Statewide: Pool Fuel by Climate Zone	150
Table 208. Statewide: Hot Tub Fuel by Climate Zone	151
Table 209. Statewide: Pool Pump Size by Climate Zone.....	151
Table 210. Average Number of TVs by type by Climate Zone	152
Table 211. Statewide: Average Number of Televisions per Single-family Household by Type and Climate Zone	152
Table 212. Statewide: Average Number of Televisions per Single-family Household by Climate Zone	153
Table 213. Statewide: Average Television Size (in inches) by Climate Zone.....	153
Table 214. Statewide: Average Television Size (in inches) by TV Type	153
Table 215. Statewide: Television Type by Climate Zone	154
Table 216. Average Number of Office Equipment Types by Climate Zone	155
Table 217. Statewide: Average Number of Computers per Single-family Household by Climate Zone	155
Table 218. Statewide: Computer Type by Climate Zone	156
Table 219. Statewide: Computer Monitor Type by Climate Zone.....	156
Table 220. Statewide: Computer Monitor Type by Computer Type	156
Table 221. Statewide: Fan Type by Climate Zone.....	157
Table 222. Statewide: Fan Usage by Climate Zone	157
Table 223. Statewide: Dehumidifier usage by Climate Zone	157
Table 224. Statewide: Average Number of Dishwasher Loads per Week by Climate Zone	158
Table 225. Household Members Work Primarily from Home by Climate Zone	158
Table 226. Household Members Work Primarily from Home by Construction Type.....	158
Table 227. Number of Household Members by Age by Climate Zone	159
Table 228. Number of Household Members by Age by Construction Type.....	160
Table 229. Highest Level of Education by Climate Zone	161
Table 230. Highest Level of Education by Construction type.....	161
Table 231. 2012 Annual Household Income by Climate Zone	162
Table 232. 2012 Annual Household Income by Dwelling Unit type.....	162
Table 233. Number of Stories by Climate Zone.....	163
Table 234. Number of Stories by Construction Type	163
Table 235. Retail Space in Building by Climate Zone	163
Table 236. Major Renovation in Past Five Years by Climate Zone	163
Table 237. Electric Utility Provider by Climate Zone	164
Table 238. Natural Gas Provider by Climate Zone	165
Table 239. Natural Gas Provider by Construction Type.....	166
Table 240. Who Pays for Natural Gas by Climate Zone	167
Table 241. Who Pays for Natural Gas by Construction Type.....	167
Table 242. Natural Gas Available on Street by Climate Zone.....	167
Table 243. Natural Gas Available on Street by Construction Type	168
Table 244. Interested in Converting to Natural Gas by Climate Zone	168
Table 245. Interested in Converting to Natural Gas by Construction Type	168

Table 246. Average Number of Fireplaces by Climate Zone	169
Table 247. Average Number of Fireplaces by Construction Type.....	169
Table 248. Heating System ENERGY STAR Rated by Climate Zone.....	170
Table 249. Heating System ENERGY STAR Rated by Construction Type	170
Table 250. Average Number of Other Heating Sources by Climate Zone.....	170
Table 251. Average Number of Other Heating Sources by Construction Type	171
Table 252. Average Room or Window Air Conditioners by Climate Zone	171
Table 253. Average Room or Window Air Conditioners by Construction Type	171
Table 254. Average Ventilation Equipment by Climate Zone.....	172
Table 255. Average Ventilation Equipment by Construction Type	172
Table 256. Presence of Programmable Thermostat by Climate Zone	173
Table 257. Presence of Programmable Thermostat by Construction Type.....	173
Table 258. Presence of Programmable Thermostat by Fuel Type.....	174
Table 259. Type of Water Heating System by Climate Zone	174
Table 260. Type of Water Heating System by Construction Type	175
Table 261. Type of Water Heating System by Heating System Type	175
Table 262. Type of Water Heating System by Water Heater Fuel	175
Table 263. Age of Primary Water Heating System by Climate Zone.....	176
Table 264. Age of Primary Water Heating System by Construction Type	176
Table 265. Age of Primary Water Heating System by Water Heater Type.....	177
Table 266. Primary Water Heater ENERGY STAR Rated by Climate Zone	177
Table 267. Primary Water Heater ENERGY STAR Rated by Construction Type.....	177
Table 268. Use Supplemental Water Heating System by Climate Zone	178
Table 269. Use Supplemental Water Heating System by Climate Zone	178
Table 270. Age of Primary Clothes Washer by Climate Zone.....	178
Table 271. Water Temperature for Wash Cycle of Clothes Washer by Climate Zone.....	179
Table 272. Water Temperature for Rinse Cycle of Clothes Washer by Climate Zone.....	179
Table 273. Primary Clothes Dryer Fuel by Climate Zone.....	179
Table 274. Age of Clothes Dryer by Climate Zone	180
Table 275. Average Number of Clothes Washer Loads per Week by Climate Zone.....	180
Table 276. Age of Primary Refrigerator by Climate Zone	180
Table 277. Primary Refrigerator is ENERGY STAR by Climate Zone.....	181
Table 278. Presence of Standalone Freezer by Climate Zone	181
Table 279. Average Age of Standalone Freezers by Climate Zone	181
Table 280. Age of Automatic Dishwasher by Climate Zone	182
Table 281. Average Number of Wine Chillers/Coolers by Climate Zone.....	182
Table 282. Wine Chillers/Coolers ENERGY STAR by Climate Zone	182
Table 283. Presence of Swimming Pool Pump by Climate Zone	183
Table 284. Presence of Swimming Pool Heater by Climate Zone.....	183
Table 285. Internet Access at Home by Climate Zone.....	183
Table 286. Office Equipment ENERGY STAR by Climate Zone	184
Table 287. Household has a Well Pump by Climate Zone.....	184
Table 288. Household has a Sump Pump by Climate Zone	185
Table 289. Household has a Waterbed Heater by Climate Zone.....	185

Table 290. Household has a Natural Gas Grill by Climate Zone.....	185
Table 291. Household has a Natural Gas Fire Pit by Climate Zone.....	186
Table 292. Household has Radiant Floor Heating by Climate Zone	186
Table 293. Familiar with Lighting Types by Climate Zone	186
Table 294. Average Number of Video Game Systems by Climate Zone.....	187
Table 295. Occupied Full or Part-time by Climate Zone	187

1 Project Summary

1.1 Background and Study Objectives

In 2011 and 2014, NYSERDA, in collaboration with the E2 Working Group¹ Statewide Study Subcommittee led by the New York State Department of Public Service (DPS), conducted a residential statewide baseline study. The NYSERDA evaluation group, in coordination with the lead contractor of this study, Tetra Tech MA, Inc. (Tetra Tech), and its subcontractors, Performance Systems Development (PSD), and GDS Associates, Inc. (GDS), developed and implemented a detailed work plan to complete this study.

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

The heating, ventilating, and air conditioning (HVAC) Market Assessment is a key component of the statewide residential baseline study. The purpose of the HVAC Market Assessment is to identify the baseline conditions for residential non-electric heating and water heating equipment, central air conditioning, and heat pumps in New York State. The market assessment describes where the market is now (based on equipment sold or installed in 2012 and after) and what percent of the equipment currently being sold is high efficiency. This information will be used to establish more accurate baselines for calculating program energy savings, to estimate the influence of NYSERDA's and other New York State program administrators' activities on the market, and to support program planning in New York State.

Data to support the market assessment were collected in single-family home surveys and on-site inspections, contractor interviews, and distributor sales reports. The compilation of sources was used to determine the baseline efficiency of specific types of residential heating and cooling equipment installed in New York State. Market channels and specification practices for these technologies were also

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

characterized. This investigation looks at the market differences throughout the State for major heating, water heating, and central air conditioning systems. Data and discussion are provided wherever the sample sizes are not sufficiently large to consider that data representative of the strata.

The study focused on units installed in single-family homes and multifamily buildings that include one to four dwelling units, or in townhouse-type configurations where individual units have their own heating systems. Multifamily units with five or more units typically have central systems served by the commercial programs, and were not part of this assessment. According to the property manager/owner survey responses, almost three-fourths (73 percent) of multifamily buildings with five or more units have central heating systems.

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

The project has three main components:

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

This volume describes the methodology for all data collection activities including sources of data, sampling strategies, and recommendations for future New York State residential baseline studies. In addition, the Appendices to this Methodology and Data Tables Volume 5 include sample letters, survey instruments, screen shots for on-site inspections and data collection, and additional data tables from data collection activities conducted for the residential baseline study. Results of the data collection and analysis for the residential baseline are presented in an executive summary and four other volumes that precede this one. In all:

- Executive Summary
- Volume 1: Single Family Baseline
- Volume 2: Multifamily Baseline
- Volume 3: HVAC Market Assessment
- Volume 4: Potential Analysis
- Volume 5: Residential Baseline Study Methodology and Data Tables

1.1 Market Segment Definitions

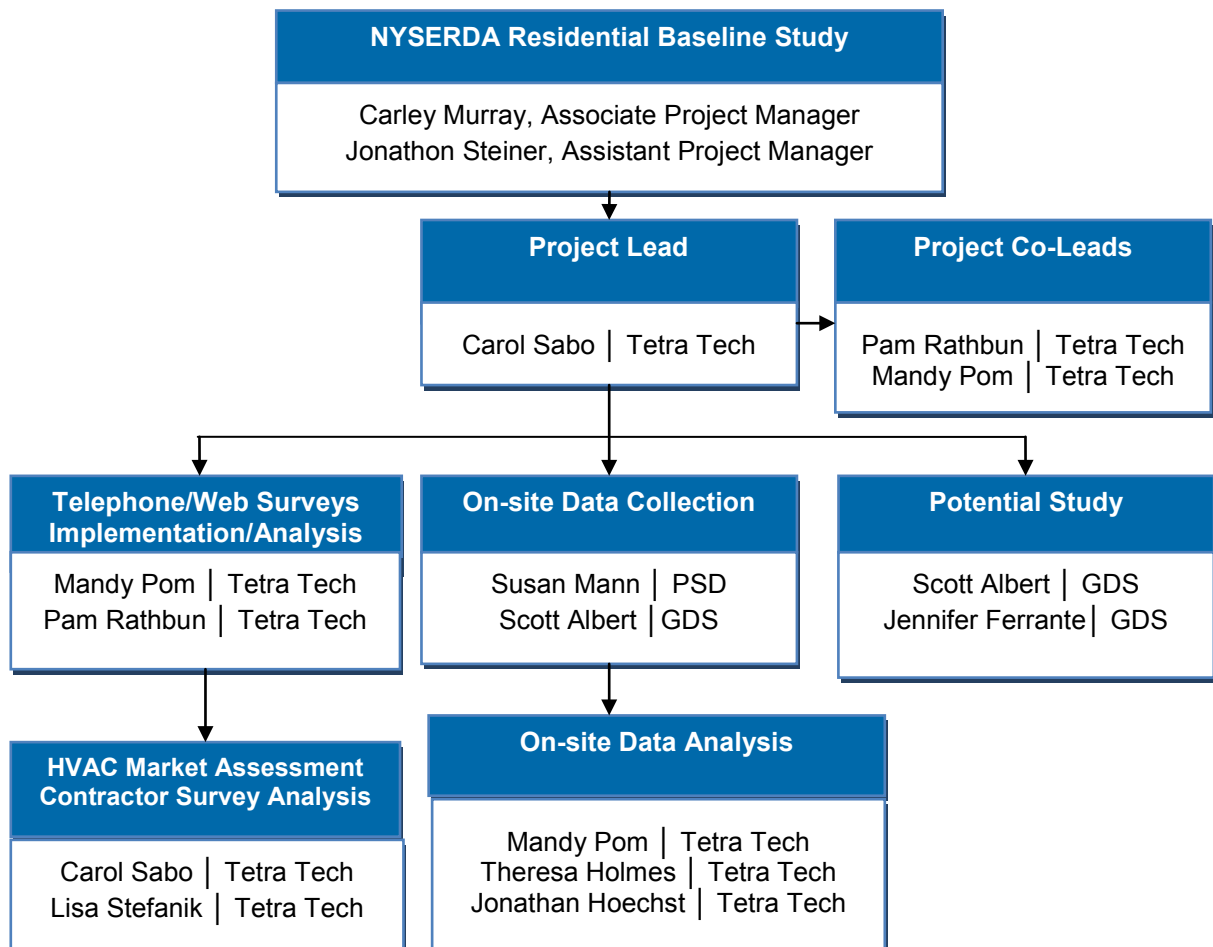
The study of the New York State residential sector included single-family and multifamily structures both existing and new construction. Most of the investor-owned utility (IOU) companies indicated in advance that they could not specifically identify multifamily tenants or new homes in the sample of residential accounts that they provided for this study. The decision was made to draw a sufficiently large random sample from the electric utility residential accounts that include single-family homes and tenant units to ensure a representative proportion of each type. After discussion with internal and external stakeholders, Tetra Tech and NYSERDA evaluation staff agreed on the following definitions, which are most consistent with New York State energy efficiency programs:

- Single family – one- to four-family buildings, including free-standing homes and townhouses
- Multifamily – five or more units excluding master metered buildings (individually or sub-metered)
 - Low rise – three stories or less (low-rise buildings)
 - High rise – four stories or more
- New construction – is defined as residential units built and occupied in 2012 or after.

1.2 Project Team

Figure 1 shows the key team members and their responsibilities for the study.

Figure 1. Key Staff



1.3 Overview of the Baseline Study Approach

For purposes of analysis, the results of the customer surveys are presented statewide overall, by age of construction (before 2012 and 2012 and after), and by the three climate zones identified for 2009 International Energy Code Conservation code (Figure 2 and Table 1). Colors on the Figure 2 correspond to climate zones shown in Table 1.

Figure 2. New York State Climate Zone Map

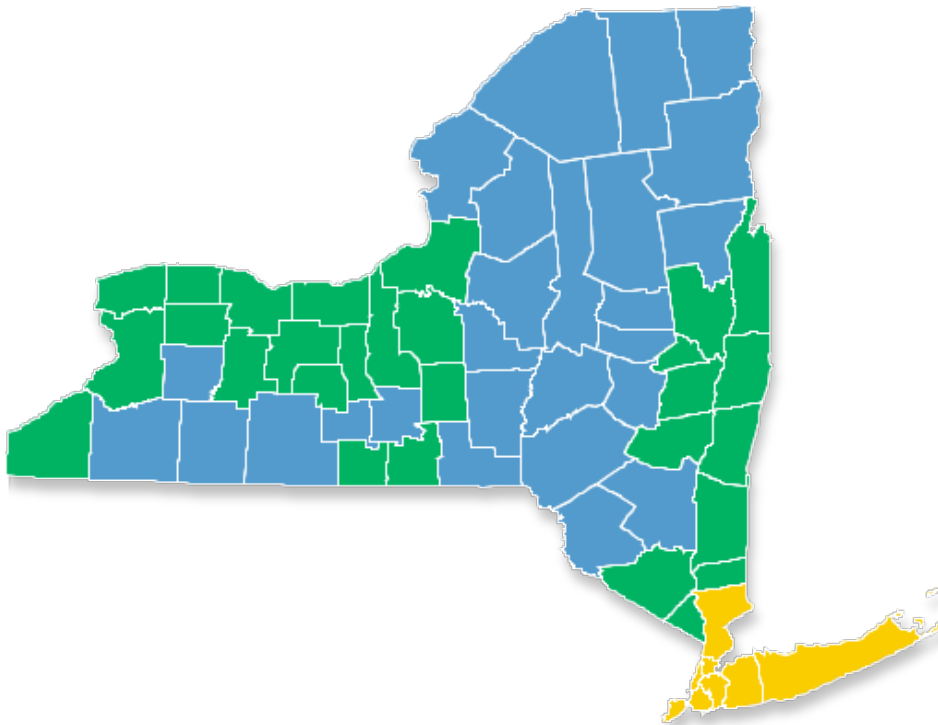


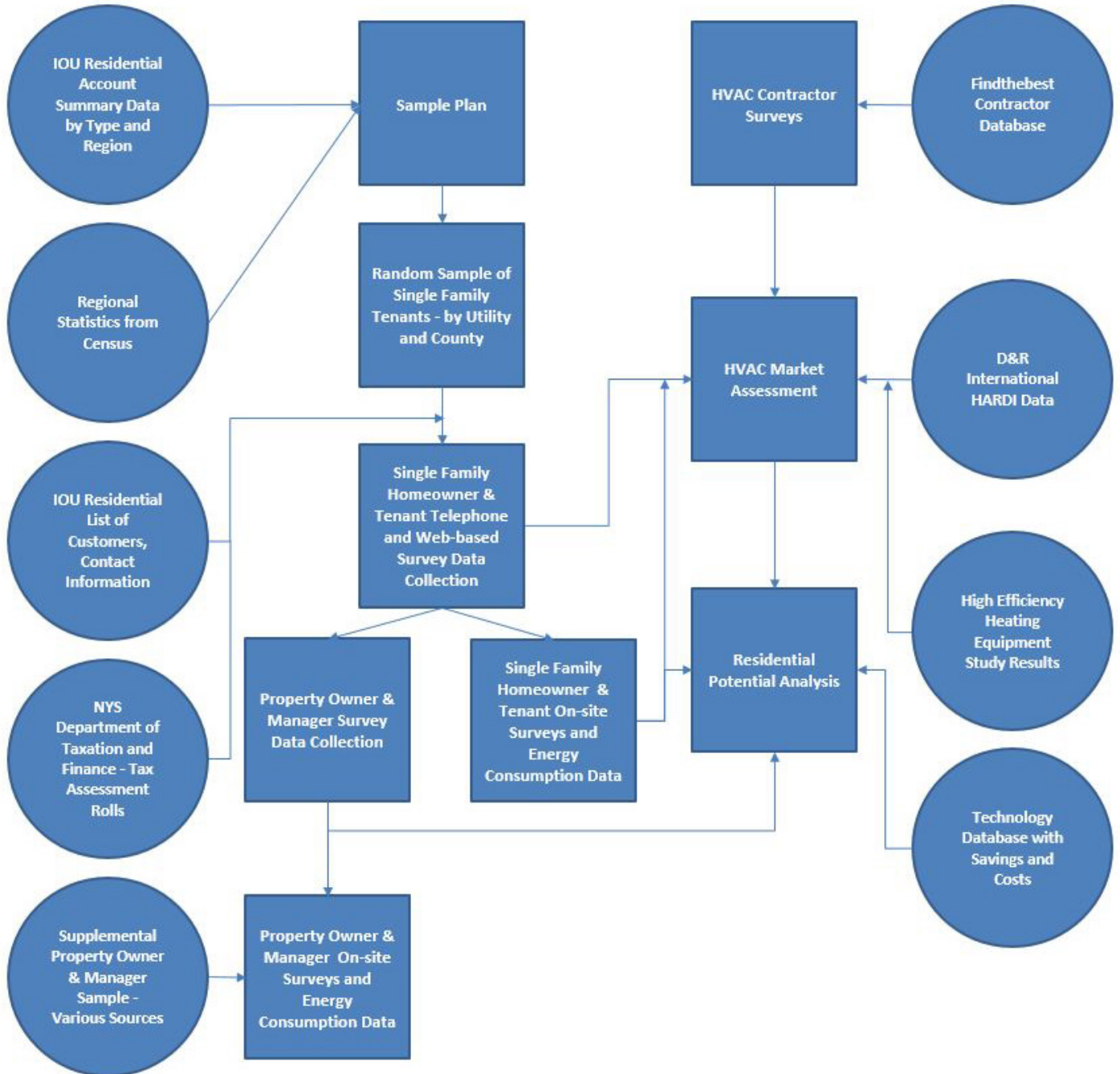
Table 1. New York State Climate Zone by County

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

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

Figure 3 shows the integration of the various data sources and outputs for each of the three major components of the residential baseline study.

Figure 3. Project Flowchart



1.4 Summary of Data Collection Activities

The original work plan included 1,500 telephone surveys for single-family homes and 500 telephone surveys with multifamily tenants. Web-based surveys were subsequently added to the work plan to increase sample productivity. Locations for on-site data collection were solicited using a nested-sample of new and existing construction single family homes and multifamily buildings that were surveyed by telephone or Web. Based on projected productivity of sample, the target number of 2,000 telephone and Web-based surveys was subsequently increased to 2,700 to help meet the target of 700 single-family, on-site completions with a goal of 70 completes for each of the 10 regions. Overall, 3,361 single family and tenant telephone or Web-based surveys were completed to ensure a sufficient number of recruits for the on-site inspections.

Table 2 summarizes the segments of interest for this project and the primary data collection completed for each segment.

Table 2. Overview of Data Collection Activities

Source: Single Family and Tenant Web and Telephone Surveys and On-site Inspections

Respondent Type	Telephone and Web Surveys: Target Completes	Telephone and Web Surveys: Actual Completes	On-site Inspections: Target Completes	On-site Inspections: Actual Completes
Existing construction single family homes (1–4 units)	1,500	2,323	500	519
New construction single family homes (1–4 units)	600	659	200	182
Total single family homes	2,100	2,982	700	700
Tenants in existing multifamily (5+ units—excludes master-metered buildings ²)	600	379	250 Tenant Units 50 Buildings	305 Tenant Units 58 Buildings
Property manager and owners for Existing multifamily (5+ units—excludes master-metered buildings)	200	219	NA	NA
New multifamily buildings	NA	NA	17	9
Total multifamily buildings			67	67
HVAC contractor surveys	60	47	NA	NA

² Master-metered multifamily buildings will be included in the upcoming statewide nonresidential baseline study.

1.5 Data Weighting

The weights used for single family and multifamily data are provided in the discussion of each of the data collection activities in this volume.

The geographic data on housing units in New York State provided totally comparable data on housing units. In addition, the weighted survey results matched very closely to other New York State data sources on the key housing characteristics that would be most important to potential analysis and program planning.

The data sampling began with the utility electric records. The sample was drawn randomly and proportionally to residential accounts in individual counties for each service area. For weighting purposes, each group of sample respondents was rolled up by county to the three climate zones in New York State. Weights were developed using the population of the same types of housing units in the counties rolled up to the climate zone level for each segment. Those segments were single-family existing, single-family new homes, and multifamily tenant units and buildings.

1.6 Comparison of Weighted Data to Other Data Sources

The individual volumes for Single Family Baseline (Volume 1), Multifamily Baseline (Volume 2), and HVAC Market Assessment (Volume 3) describe the comparisons of key data from this study to other sources of New York State residential data when available. These comparisons were made to assess the representativeness of the data from this study.

The residential baseline study results were compared to various other studies that provided data for New York State residential homes. In addition, self-reported data from the telephone and Web surveys were compared to the same data collected on-site for key characteristics. The key sources that included New York State data for comparison are:

- 2005-2009 American Community Survey: 2005-2009, 2009-2013, 2013
- U.S. Energy Information Administration, Office of Energy Consumption and Efficiency Statistics, Forms EIA-457
- U. S. Energy Information Administration: 2009 Residential Energy Consumption Survey (RECS)
- U.S. Census Bureau Population Estimates. 2010 Census Redistricting Data (PL 94-171). Released March 24, 2011
- U. S. Census Bureau Population Estimates. Occupied housing units by house heating fuel 2005-2009. USA Counties Data File
- D&R International and the Heating Air-conditioning & Refrigeration Distributors International (HARDI) data for 2013

For those housing characteristics that are of most importance to potential analysis and program planning, the data from this baseline study matched very well to the other sources of New York State data. Many of the demographic variables that differed between the sample and the population are characteristic of the respondent rather than the building or household, which was the unit of analysis in this study. Key characteristics of buildings within this study sample, namely age of home, primary heating fuel, square footage, number of bedrooms, number of occupants, and average annual fuel use compare closely with population benchmark sources, and strongly support this study's representativeness of New York State residential building stock. Although the key characteristics were found to be representative of New York State, as compared to the sources previously listed, there were some differences between the self-reported survey results and the on-site observations. Specifically, ENERGY STAR[®] equipment, appliances, and square footage did show some discrepancies between data collection methods, but this discrepancy was expected. As a result, the on-site inspection data was used when observed data was expected to be more accurate than self-report surveys.

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

Differences in the sample versus population demographics that existed could not be conclusively identified nor appropriately corrected for in weighting, so no such adjustments were made in the results. The study team believes that some of the observed difference could be explained by the varied ways in which data were collected for this study and the population benchmark studies. For example, this study estimates that 34 percent of households or building units have at least one household member with a

graduate degree. In comparison, about 14.5 percent of individuals directly responding to the Census surveys have graduate degrees themselves. Furthermore, those who responded to the Web-based surveys reported more often that someone in the household had a graduate degree (e.g., master's degree or doctorate) than those who responded to telephone surveys. The large difference may reflect survey bias, or it may simply reflect that this study is measuring the highest level of education across all household members while the Census is measuring highest level of education of a single individual.

There were some demographic data that could not be compared. Educational attainment was asked for all people living in the household. The Census data could not be used as a direct comparison for educational attainment because the education level was only asked for the individual survey respondent not the entire household.

The homeownership levels from the baseline survey respondents were also slightly higher in comparison to Census data. This variation may be explained in part by the fact that there may be some homeowners answering the baseline surveys who were not occupants of the home, while the Census surveys were targeted to the occupants of the home. Additionally, this difference could also be related to homeownership issues that were occurring throughout the U.S. in 2010.

Specific multifamily comparisons were problematic due to the differences in building definitions between sources. Master-metered buildings were excluded from this study because these buildings are more closely aligned with commercial buildings and the associated energy usage characteristics, while the U.S. Census, including the American Community Survey and Residential Energy Consumption survey, include master-metered buildings in their definition of multifamily. Additionally, the Census data was reported by occupants about their tenant units and not for the multifamily building, while this study is a mix of tenant, owner, and building manager self-reports and on-site verification. These substantial differences don't allow for an accurate comparison to the residential baseline study results for heating and cooling systems. The multifamily Census data does not differentiate between central building systems and individual tenant unit systems. In addition, other sources for multifamily data were only at the U.S. level, did not provide New York State data and did not provide definitions of multifamily in terms of number of units. Age of building was the one factor that could be used directly for comparison and there was a close match within 2 percentage points.

Although lacking the ability to confirm the multifamily data with other sources, the survey team followed a very rigorous process in working the list of property managers and owners that started from the tenant accounts pulled in the random draw from the utility records. In many cases, up to 20 attempts were made before dropping the property manager or owner from the list. A rigorous survey process is a best practice to reducing self-selection bias in the telephone surveys without comparable data for post-weighting. The details of any data comparisons are provided in the individual volumes for single family, multifamily, and HVAC.

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

1.7 Statistical Confidence and Precision

The objective of the sampling strategy was to strive for a 90/10 confidence and precision level for statewide results and for each of the three climate zones. Precision is an assessment of the error margin of the final estimate. Confidence is the likelihood that the sampling will result in the true value within a certain range of values (i.e., precision). For example, a sample-based estimate having a 90% probability of falling in a range of $\pm 10\%$ of the true population value is denoted as 90/10 confidence/precision. The statistical definition of the 90 percent confidence interval is that if the telephone survey were conducted 100 times, 90 times the percent of respondents who answered a question a certain way would fall within the calculated confidence intervals and in 10 times the percent answering the question would be outside the range of the confidence intervals. To meet the 90/10 confidence and precision, the sample completes from a population of at least 20,000 should be 68 respondents.

In most cases, the data tables in the report volumes have notes to show the confidence and precision of the data based on number of survey respondents. Ideally, the data should meet 90/15 confidence/precision with 31 respondents, in terms of this study though almost all the survey data meets the 80/20 confidence with 11 respondents. Due to the size and complexity of this study, different levels of confidence were achieved depending on the stratification and those different confidence levels are explicitly noted throughout the various volumes. At a high-level, each data collection activity is discussed below with further details concerning confidence and precision:

- The single family telephone and web surveys easily meet or exceed the 90/10 confidence/precision for existing homes and for new homes statewide. Existing and all single family homes meet 90/10 by climate zone with more than 68 respondents. The new homes survey sample size would meet the 90/10 for climate zones 5 and 6, but climate zone 4 with only 22 new homes in the survey would meet the 90/20 confidence and precision.
- The single family on-site sample for existing and all homes meets the 90/10 statewide and by climate zone. Single family new homes in the on-sites meet 90/10 for climate zone 5, 90/12 for climate zone 6, and 80/20 for climate zone 4.
- Multifamily tenant telephone and Web surveys meet 90/10 confidence and precision for existing homes and for all homes statewide. The multifamily tenant survey meets 90/10 for all climate zones but climate zone 6, which would have slightly less precision with 90/12 for the 47 survey completes.
- Multifamily building property manager and owner telephone surveys meet 90/10 statewide and for climate zones 4 and 5, while climate zone 6 is at 90/15 confidence and precision. Finally, there are 67 on-sites for multifamily buildings that would only meet a 90/10 at a statewide basis. Given the small number of new construction multifamily buildings, the data is not presented separately for that segment.
- The HVAC contractor telephone surveys were analyzed separately for large contractors (more than 10 employees) and for small contractors (up to 10 employees). The sample sizes for each group would meet a 90/20 confidence and precision, but each of the data tables has a different number of respondents by type of equipment. The confidence/precision level is noted for each of these numbers of respondents in the tables in Volume 3.

2 Single Family and Tenant Survey

2.1 Summary of Approach

A combination of telephone and Web surveys were conducted with a sample of existing and new construction residential single-family building occupants and multifamily tenants. The original sample was drawn from the electric utility residential customer information systems and supplemented with data from the New York State Department of Taxation and Finance for newly constructed homes. The key objectives of the surveys were to provide up-to-date, self-reported estimates of equipment types, fuel types and uses, vintages, and efficiencies, as well as information on building characteristics, demographics, homeowner energy consumption attitudes and behaviors, participation in energy efficiency programs, and market barriers.

The telephone and Web surveys were also used to recruit single-family homes for on-site inspections. In addition, the tenants included in these surveys were also asked for contact information for their property owners or managers to recruit them for the property manager or owner surveys and on-site inspections.

One telephone and Web survey instrument was used for both single-family homeowners or occupants and multifamily tenants. The tenant responses were indicative of multifamily units and are included in the multifamily baseline volume. Tetra Tech developed the draft survey instruments with input from NYSERDA's evaluation and program staff, the New York State Department of Public Service and the E2 Working Group. All draft survey instruments were reviewed and approved by NYSERDA prior to pretesting. Tetra Tech then conducted a pretest of each survey instrument and made revisions to the questions to address any issues identified.

Notification letters were sent out by NYSERDA to potential survey respondents in advance of the survey. The letter provided sampled households with a telephone number, website, and a unique identification number to access and complete the survey via telephone or online. Tetra Tech then attempted to call all households who did not respond to the survey via the Web. NYSERDA followed up these attempts with email reminders, where email addresses had been provided in the utility customer records. Tetra Tech conducted the telephone surveys from the Tetra Tech in-house Computer Assisted Telephone Interviewing (CATI) lab. Tetra Tech used multiple call-back attempts, mailings, and emails to reach the

appropriate respondent to increase the survey response rate and minimize the potential for nonresponse bias. The Web survey option was added early in the study to increase the response rate of the survey participants, which proved to be successful because more than half of the survey completes are the result of the Web survey option.

Although Tetra Tech originally proposed a cash incentive be provided with the advance letter survey mailings to encourage those contacted to complete the survey, this approach did not meet NYSERDA requirements for incentive delivery and tracking. After exploring multiple other options, Tetra Tech and NYSERDA agreed to use Amazon gift cards as the incentive. Tetra Tech purchased, in bulk and advance, the supply of gift cards needed for this study. Tetra Tech used in-house mailing to send the \$20 gift card via U.S. Postal Service Priority Mail to participants who completed either the telephone or Web survey. If requested, the survey respondents were provided with an optional pre-paid Visa card.

2.2 Sampling Strategy

The sample for the single-family baseline study was primarily populated by a random sample of residential electric utility accounts provided by each of the IOUs. The telephone and Web surveys were also used to recruit homes that would receive more extensive on-site inspection.

The sample strategy was informed by reviews of other residential baseline studies, as well as numerous meetings with NYSERDA's evaluation and program staff, DPS, IOU staff, and other NYSERDA evaluation contractors who were planning research in New York State. The Tetra Tech Evaluation Team also considered various data collection methods in developing a final sampling strategy. Because the nonparticipant utility customer data was initially inaccessible, the data collection methods included a random digit dialing (RDD) approach for a telephone survey and purchasing an address-based database for a mail survey approach. Ultimately, the Tetra Tech Team and NYSERDA Evaluation determined that the optimal study approach was to use nonparticipant customer contact (telephone and email where available) and annual electric usage information provided by New York State's IOUs to develop a sample of residential customers. The IOUs represented 90 percent of the homes in New York State—the rest are primarily customers of municipal and cooperative electric utilities.

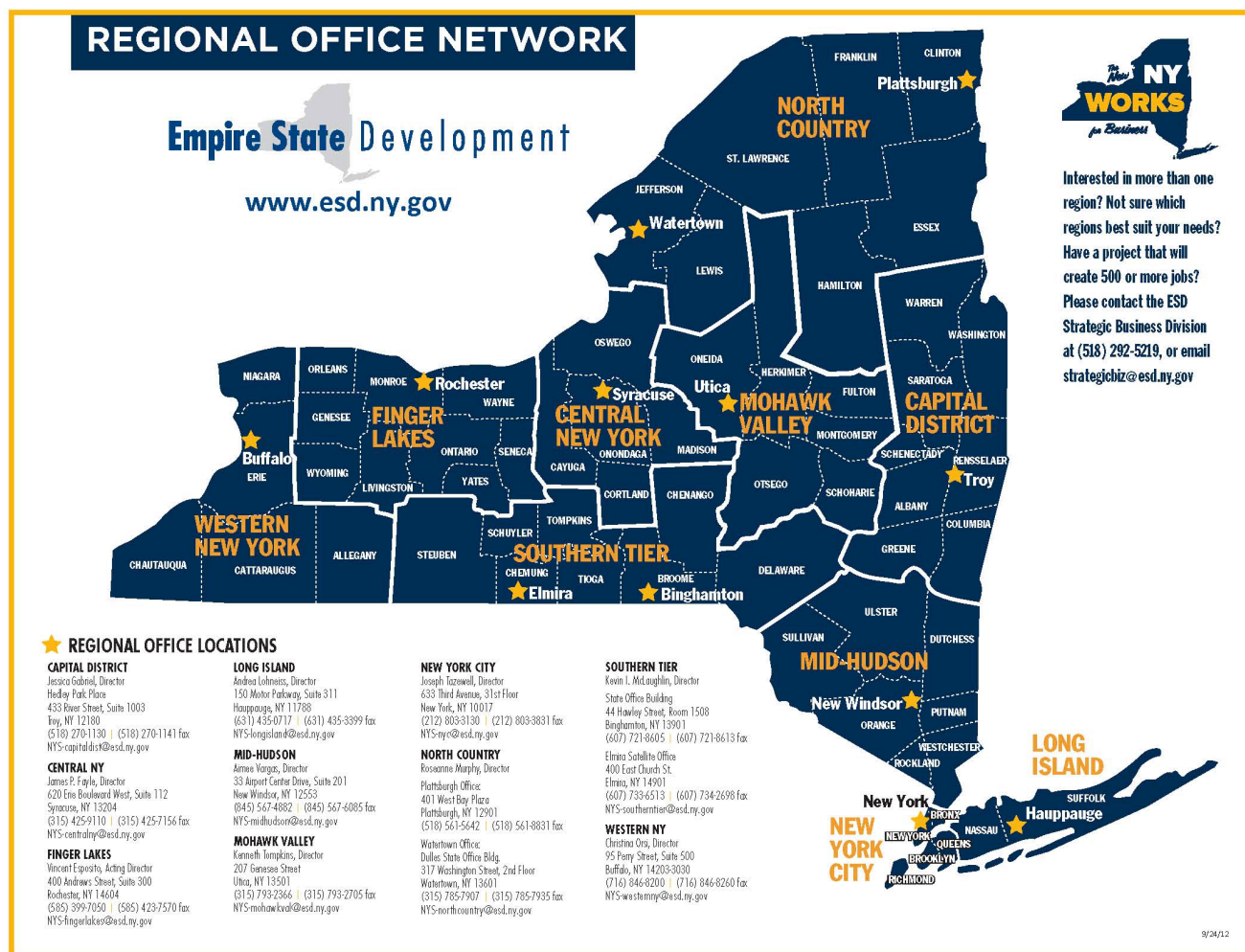
For NYSERDA to access the nonparticipant customer contact information, DPS revisited its Customer Data Guidelines. This revision was finalized on December 21, 2012. This revision to the guidelines was necessary to clarify the process for maintaining the confidentiality of customer data. In particular, the change would specifically allow access to customer energy consumption data that would be analyzed to develop a sampling strategy and sample. The revised guidelines allowed NYSERDA and its evaluation contractors to obtain nonparticipant contact information under the same circumstances and restrictions as utility program administrators.

Another consideration in designing the sampling was the optimal geographic stratification of the sample. A regional stratification was necessary to ensure adequate representation across the State for different housing types and fuel uses. For the telephone and Web-based survey of single family households and multifamily tenants, the Tetra Tech team recommended drawing the sample by the 10 Economic Development Regions in New York (Figure 4). The intent was to ensure that the study had coverage across all geographic areas of the state while meeting the 90/10 confidence and precision at the climate zone and statewide levels.

Sampling by the 10 Economic Development Regions provided a comprehensive statewide baseline assessment of the residential market across a range of customer segments, fuel uses, and energy measures. The alternative approach was a proportional sample at the statewide level that would result in an unbalanced focus on the New York City and Long Island Economic Development Regions. The counties within these 10 Economic Development Regions were also mapped to the three New York climate zones used in potential study in Volume 4 of this study.

Figure 4. New York Economic Development Regions

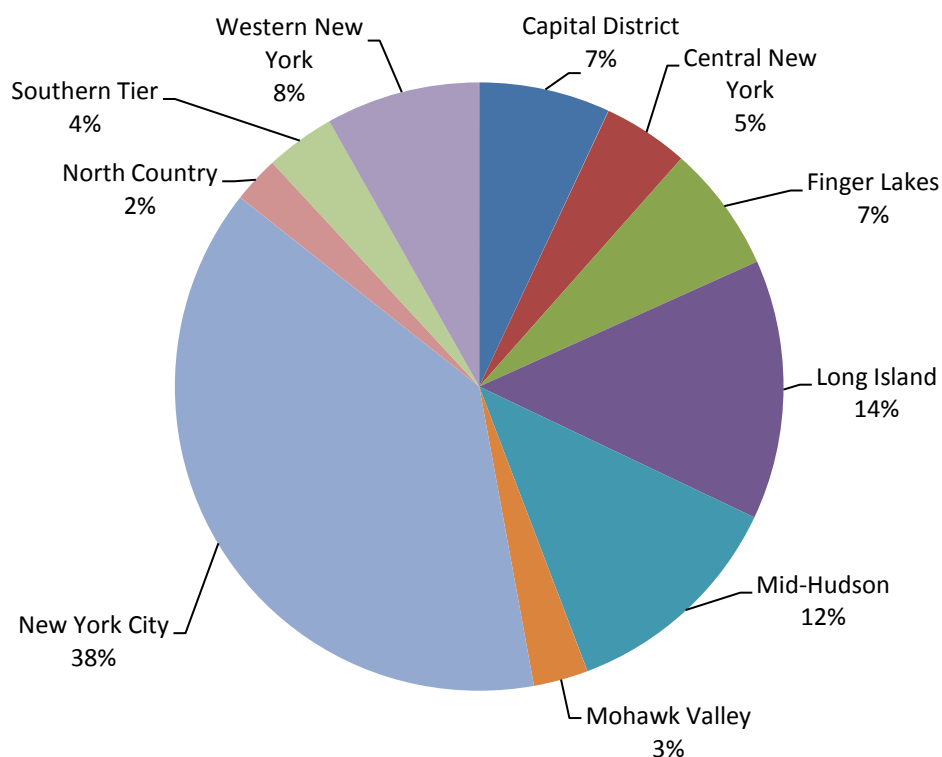
Source: Empire State Development (www.esd.ny.gov)



As a first step to determining the sample design, the Tetra Tech Team requested and received from the electric IOUs aggregate information on the number of residential, individually metered (or sub-metered) electric accounts (Phase I Data Request).³ The information was requested by county, as counties map to the 10 New York Economic Development Regions, as well as the three New York climate zones. The aggregate information from each electric IOU by county was then combined and rolled up to the Economic Development Region and statewide level, which is shown in Figure 5. The total electric accounts were also compared to the total households provided in the 2009 Census data to confirm that the counts were accurate.

³ The information for sub-metered electric accounts was not universally available from each of the IOUs.

Figure 5. Distribution of Residential Electric Accounts by Economic Development Region in New York



The Phase I Data Request outlined the format of the data including the need for the electric IOUs to categorize their residential electric accounts by single family versus multifamily, as well as new versus existing construction. New construction was defined as being completed in 2012 or later. Three of the seven utilities were able to identify and provide counts of multifamily units, while only one utility was able to accurately provide counts of new construction.

Because some electric IOUs were not able to provide the additional breakdown of total residential customers by multifamily and new construction, the Tetra Tech Team requested a random sample of residential customers by County from each utility with no additional pre-stratification other than by Economic Development Region (Phase II data request).⁴ The data formats varied significantly by utility, making it difficult to compare or combine data sets without additional work.

⁴ Program participants should be included in the sample, as they are part of the statewide population.

Based on discussions with Con Edison and feedback regarding the productivity of samples for other studies conducted in the New York City region, the sample points requested for their service area were initially doubled. Late in the study, an additional 5,000 residential customer accounts were requested of and provided by Con Edison. To expedite completion of the on-sites in New York City, this additional sample of households from Con Edison were not required to complete the telephone or Web-based survey in advance. Instead, a “mini-survey” was completed by the inspector while doing on-site data collection at 35 homes in New York City.

Preliminary discussions with the utilities indicated the most constant indication of new construction across utilities was the meter set date. Tetra Tech attempted to pre-stratify the sample for new construction single family homes using this variable, but found that data element did not align with actual newly constructed homes (constructed in 2012 or newer). To ensure a sufficient sample of new homes were included, particularly for the on-site data collection, the new construction sample was supplemented with tax assessment roll information obtained by NYSERDA from the New York State Department of Taxation and Finance for years 2011, 2012, and 2013 for all regions except New York City (due to the structure of the file).

2.3 Response Rates

The study originally proposed achieving 200 completed telephone surveys in each of the 10 New York Economic Development Regions across single-family and multifamily tenant accounts. As shown in Table 3, the single-family baseline study completed 2,982 telephone or Web surveys with single-family homeowners or occupants. These respondents included both existing homes (built before 2012) and new construction (built in 2012 and later). After a Web option was added to the single-family and tenant surveys, the majority of respondents (69 percent) opted to complete the survey via the Web (Table 4). Table 5 illustrates that the single family and tenant survey response rate was 13.6 percent. Despite offering two different modes for response (Web and follow-up telephone surveys) and a post-paid incentive (\$20 gift card), the response rate to the single family and tenant survey was lower than anticipated. Other baseline surveys that the evaluation team has been involved with have seen response rates ranging from 30 to 50 percent. However, those surveys were a different mode (mail survey), had a pre-paid cash incentive (\$5), and were significantly shorter in length. In addition, those other studies were also conducted in states where response rates are typically higher, and the surveys were sponsored by the customers’ utility.

Table 3. Single Family Survey Completes by Method

	Region										Total
	Capital District	Central New York	Finger Lakes	Long Island	Mid-Hudson	Mohawk Valley	New York City	North Country	Southern Tier	Western New York	
Phone complete	119	63	88	83	101	101	64	87	121	86	913
Web complete	297	195	259	148	247	204	102	211	129	242	2,034
In-person mini-survey completed during on-site inspections	0	0	0	0	0	0	35	0	0	0	35
Total	416	258	347	231	348	305	201	298	250	328	2,982

Table 4. Tenant Survey Completes by Method

	Region										Total
	Capital District	Central New York	Finger Lakes	Long Island	Mid-Hudson	Mohawk Valley	New York City	North Country	Southern Tier	Western New York	
Phone complete	14	3	8	7	11	3	68	0	7	7	128
Web complete	15	6	12	11	27	9	143	8	14	6	251
Total	29	9	20	18	38	12	211	8	21	13	379

Table 5. Single Family and Tenant Telephone and Web Survey Disposition and Response Rate*

	Region										
	Capital District	Central New York	Finger Lakes	Long Island	Mid-Hudson	Mohawk Valley	New York City	North Country	Southern Tier	Western New York	Total
Complete - phone	133	66	96	90	112	104	132	87	128	93	1,041
Complete - Web	312	201	271	159	274	213	245	219	143	248	2,285
Partial	14	1	3	5	7	10	10	5	7	5	67
Refusal	286	200	157	361	309	215	421	151	129	138	2,367
Invalid phone number	139	102	150	405	242	156	486	136	89	126	2,031
Business line	14	9	14	16	22	9	35	15	6	20	160
Language barrier	1	2	2	13	28	4	149	1	0	2	202
Ineligible - deceased or incapable	6	6	3	15	7	7	16	3	0	8	71
No longer living at address	33	15	19	23	21	17	40	26	24	17	235
Active sample - no answer, busy, callback, answering machine	2,145	1,455	1,847	2,057	1,972	1,443	2,272	1,051	370	1,475	16,087
Total	3,083	2,057	2,562	3,144	2,994	2,178	3,806	1,694	896	2,132	24,546
Response rate	14.4%	13%	14.3%	7.9%	12.9%	14.6%	9.9%	18.1%	30.2%	16%	13.6%
Cooperation rate	15.4%	13.9%	15.5%	9.3%	14.4%	16.0%	12.2%	20.2%	34.9%	17.4%	15.2%
* Response rate is calculated by the number of telephone survey and Web completes divided by total sample. Cooperation rate is calculated by the number of telephone and Web survey completes divided by total sample minus invalid phone number, residential line, and ineligible cases..											

The primary data collection via telephone and Web surveys commenced on November 4, 2013, and continued until April 3, 2014. Although the initial survey deployment schedule included a brief hiatus between regions, because the productivity of the sample was lower than anticipated, the evaluation team modified the approach to lessen the time between regional deployments. The intent was to complete each region before moving on to another, however, the surveys were driven by the on-site schedule and ensuring a sufficient number of recruits from the surveys to reach the target number of on-sites in the region. The continuous deployment of telephone and Web-based surveys assisted in managing the workload and staffing of the telephone survey (CATI) lab.

2.4 Weighting

By understanding how many households in the population were assigned to each strata and knowing how many completed surveys were obtained for each, the evaluation team developed analysis weights so that the data can be reported accurately for the region and the State. The population counts and survey completes are used to weight the telephone and Web survey data to ensure that it accurately reflects the original population distribution by climate zone.

All surveys experience some degree of nonresponse. Because nonrespondents may differ from respondents in terms of the variables collected in the survey, the occurrence of nonresponse can indicate bias within survey results.

To check for potential bias, the evaluation team compared weighted distributions to results from other surveys and data sources. Across a wide number of building characteristics (i.e., age of home, primary heating fuel, square footage, number of bedrooms, number of occupants, household income, average annual fuel use), the marginal distribution of the sampling weights was in agreement with known auxiliary information from other sources. Overall, these comparisons suggest the study results are representative of the entire population of residential buildings in New York State.

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

Differences in the sample versus population demographics that existed could not be conclusively identified nor appropriately corrected for in weighting, so no such adjustments were made in the results. The study team believes that some of the observed difference could be explained by the varied ways in which data were collected for this study and the population benchmark studies. For example, this study estimates that 34 percent of households or building units have at least one household member with a graduate degree. In comparison, about 14.5 percent of individuals directly responding to the Census surveys have graduate degrees themselves. The large difference may reflect survey bias, or it may simply reflect that this study is measuring the highest level of education across all household members while the Census is measuring highest level of education of a single individual.

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

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

The final weights for the single family and tenant baseline survey respondents are shown in Table 6 and Table 7.

Table 6. Single Family and Tenant Survey Weights: New Construction

Climate Zone	Population		Single Family and Tenant Survey Completes		Single Family and Tenant Weights	
	Number of Units in Single Family Buildings	Number of Units in Multifamily Buildings	Number of Units in Single Family Buildings	Number of Units in Multifamily Buildings	Number of Units in Single Family Buildings	Number of Units in Multifamily Buildings
	(1–4 units)	(5+ units)	(1–4 units)	(5+ units)	(1–4 units)	(5+ units)
Climate zone 4	2,689	9,433	22	2	122.23	4,716.50
Climate zone 5	5,211	2,331	481	7	10.83	333
Climate zone 6	1,725	676	157	2	10.99	338
Total	9,625	12,440	660	11	-	-

Table 7. Single Family and Tenant Survey Weights: Existing Construction

Climate Zone	Population		Single Family and Tenant Survey Completes		Single Family and Tenant Weights	
	Number of Units in Single Family Buildings	Number of Units in Multifamily Buildings	Number of Units in Single Family Buildings	Number of Units in Multifamily Buildings	Number of Units in Single Family Buildings	Number of Units in Multifamily Buildings
	(1–4 units)	(5+ units)	(1–4 units)	(5+ units)	(1–4 units)	(5+ units)
Climate zone 4	2,255,727	1,695,304	489	249	4,612.94	6,808.45
Climate zone 5	1,874,097	252,074	1,021	74	1,835.55	3,406.40
Climate zone 6	740,527	90,501	812	45	911.98	2,011.14
Total	4,870,350	2,037,880	2,322	368	-	-

2.5 Data Limitations and Suggestions for Future Studies

The limitations of a study are those characteristics of design or methodology that impacted or influenced the application or interpretation of the results. This section presents the barriers and approaches used to overcome them. Additionally, this section presents the constraints on applicability of the findings of the Residential Statewide Baseline Study and makes recommendations for the future should this study be replicated.

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

- The regional sampling approach, using the Economic Development Regions, was useful to ensure all areas of the State had reasonable representation in the data collection.
- DPS revised its Customer Data Guidelines on December 21, 2012, authorizing NYSERDA access to nonparticipant residential consumption data. The original sampling plan for this study explored utilizing Random Digit Dial and a purchased sample. Although working through the revision to the Customer Data Guidelines delayed the start of the project, the authorization allowed the evaluation team to use the optimal approach of obtaining random samples from each of the IOU's residential customer accounts.
- Amazon gift cards were used as the post-paid incentive because this approach met NYSERDA requirements for incentive delivery and tracking. Despite the fact that Amazon is a single vendor, they sell products from thousands of vendors. Less than one percent of households requested that they receive a pre-paid Visa card rather than an Amazon gift card.
- The multimode study was optimal. The evaluation team used a telephone and Web survey combination. Approximately 60% of completed surveys resulted from the Web with the remainder from the phone. Given the increasing reluctance of respondents to participate in telephone surveys, a future study should consider a Web and mail combination. The cost per complete for telephone surveys is higher than a Web survey, but a mail survey would ensure that those who do not use the Internet would be covered as well. In addition, the multimode method would allow for comparison of the demographics of respondents from each method to other data sources.
- The nested sample approach of using the telephone and Web surveys to assess interest in participating in the on-site inspection was helpful for recruiting purposes by providing interested respondents. In addition, it provided an opportunity to compare self-reported information to the observations made during the on-site inspections for some key variables. Although the surveys provided rich data for analysis, having to complete the surveys first did slow down the schedule for on-site inspections and increased the length of the study.

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

- The new construction survey targets should be established after an analysis of new construction estimates by region. Data on building permits could be used as a proxy although the permits do not always result in a completed new home. New construction quotas were very difficult to achieve given that the IOUs could not stratify the population by date of construction. In most cases, the target completes were too high for the region given the percentage of the newly constructed homes in the population. Given the differences by climate zone, it would still be necessary to establish quotas with oversampling to ensure reporting at a 90/10 confidence and precision by climate zone instead of using a random proportional sampling approach.

- The assessment rolls from the New York State Department of Taxation and Finance should be acquired and used as one source of new construction households in future studies. Other sources should be explored as well because the tax assessment data could not be used for all areas of the State and it only contained mailing addresses for tax purposes (not phone numbers or email addresses). The file for New York City was in a different format and did not have a way to flag year built.
- For future studies, the evaluation team recommends ensuring that email addresses are gathered as part of the sample. Web surveys are an economic and efficient way to send survey invites and survey reminders. NYSERDA sent email invitations to people with email addresses and then sent an email reminder about a week later. These contacts were in addition to the postal letter that was mailed and telephone call attempts.
- The response rates varied from 7 to 30% by region. For future studies, the starting sample size should be adjusted accordingly by region to reflect those response rates. In particular, the New York City region had very low response rates and although the initial sample was double the rest of the regions, it was necessary to go back and request another sample late in the data collection.
- In terms of best times to collect survey data, response rates to the survey were lowest of any point in the survey period around the Christmas and New Year holidays.
- NYSERDA is moving away from offering financial incentives and that will affect the response rates for surveys, particularly for nonparticipants in these types of general population surveys. Future studies should consider other options and identify value propositions to motivate residential homeowners and occupants to participate in these types of studies.
- Survey question wording for key data points should be compared to auxiliary sources, such as U.S. Census data, that may be used for comparison to determine any sample bias. For example, there is some indication that survey respondents may have much higher education attainment in their household than the general population. Given the differences in how the questions were asked in auxiliary data sources, it was not possible to determine the level of bias and weight data accordingly. At the same time, the key characteristics of homes for baseline and potential estimates did not vary from these other sources as described in Table 1 of Volume 1.

3 Single Family On-site Data Collection

3.1 Summary of Approach

Performance Systems Development (PSD), under the direction of Tetra Tech, conducted on-site inspections at a subset of existing and newly constructed single-family homes that participated in the telephone or Web surveys. PSD conducted the on-site inspections to meet targets by region as determined in the sample design. Although the original approach was to complete a region before moving on to the next, it was necessary to go back to some of the regions to meet quotas by climate zone and to enter multiple regions simultaneously. All scheduling for the on-site inspections was conducted by personnel with at least one year's relevant experience.

Some of the types of data that were collected during the on-site inspections included:

- Heating and cooling systems and water heaters—number and types, age, size, fuel type, set points, efficiency levels, controls, and other nameplate data.
- Other appliances—number and types, age, fuel type, ENERGY STAR, features that affect energy efficiency, usage patterns.
- Building shell characteristics.
- Lighting.
- Plug loads (consumer electronics and office equipment)—types, numbers, behavioral characteristics.
- Air leakage assessment.
- Renewables (e.g., number, types, age).

Tetra Tech customized its secure Web-based tool to manage recruiting and scheduling needs for the telephone survey respondents who were screened and pre-recruited to participate in an on-site inspection. The scheduling tool was designed to manage information collected in the telephone and Web survey, provide prospective information on on-site inspection participants; manage on-site inspection recruitment call attempts and dispositions; and view schedule availability by day, city, and technician. In addition, the scheduling tool was used to schedule an on-site inspection at a specified date and time, and notify staff and/or inspectors via email if an on-site inspection had been scheduled, rescheduled, or cancelled.

Personnel conducting the on-site inspections were required to successfully complete proper training and have relevant experience necessary to conduct a comprehensive assessment of the home. Completion of Home Energy Rating System (HERS Rater Building Performance Institute (BPI) Building Analyst training programs were a prerequisite for all on-site inspectors who would be collecting data from new construction homes. Additional mandatory project-specific training for on-site inspectors on specific data collection needs and procedures were led by PSD certified trainers. Full-day training sessions for two different groups were conducted before the inspectors began the on-site data inspections—one in Ithaca and one in Albany, NY. In addition, an experienced PSD staff member went on at least one on-site inspection with each inspector for further training and as part of the quality assurance/quality control (QA/QC) process. Certified HERS Raters were used for new construction on-site inspections, and these raters were responsible for developing and submitting a final energy rating for each home.

In addition, PSD staff implemented a QA/QC process to verify that the on-site inspectors were meeting standards of performance for the on-site inspections, and that the data collected were accurate and reliable. QA protocols included: (1) QA on-site inspection for first on-site inspection with each inspector; (2) surprise ride-along on 5 percent of the on-site inspections; and (3) on-going desktop reviews of all data collected during the on-site inspection.

The evaluation team also worked with NYSERDA, DPS, the E2 Working Group subcommittee, and other stakeholders to finalize policies and procedures on how to address any health and safety issues identified during the on-site inspection. A health and safety checklist was developed and used for the on-site inspections and specific protocols for reporting and/or escalation of issues was developed and deployed. As inspections were not comprehensive home assessments, and a scope of work was not developed or implemented, standard BPI requirements were followed for the specific elements that were included in the on-site inspections.

PSD and GDS led the on-site inspections for single-family and multifamily respectively. In that role, the two firms ensured the on-site inspectors collected and recorded all agreed upon on-site data, including duct blaster and blower door test results (where applicable). Blower door tests were not conducted during the on-site inspections where BPI standards would preclude such testing or when the structure of the home would make it difficult to produce reliable results.

The inspectors used a tablet-based, pre-programmed, and approved version of the on-site inspection data collection tool. Tablet, server, and data storage and transfer security protocols were established, checked on each device, and enforced per NYSERDA security requirements. The on-site inspector uploaded the site-specific information directly to a secure server using NYSERDA security protocols. The server was hosted in a secure data center with both network and physical protections to prevent unauthorized access. Secure backups of all electronic data collection were retained for quality verification and project records throughout the on-site inspection and subsequent data analysis and reporting process.

For those respondents agreeing to the on-site inspection, the PSD recruiter provided the respondent information on what to expect and how to prepare for the inspection. The preparation included gathering energy consumption data to determine typical or most recent 12 months of energy usage for electricity, natural gas, and delivered fuels. The homeowner or tenant was reminded before the on-site inspection to have that data available. For delivered fuels, or bulk fuels, the inspector asked the homeowner to call their provider(s) during the on-site inspection to get average annual consumption. This information was recorded directly in the data collection tool. In addition to recording consumption data, inspectors obtained signed billing and consumption data release forms from homeowners or tenants.

Tetra Tech and NYSERDA agreed that Tetra Tech would bulk order Amazon gift cards as an incentive to those agreeing to the on-site inspection. Originally, Tetra Tech planned to express mail a group of the gift cards in advance to the on-site inspectors for each region to hand out after the on-site inspection was complete. The evaluation team decided that the logistics would present some problems in ensuring the packets were delivered while the inspectors were in the field in that location. Tetra Tech and NYSERDA subsequently decided to use Tetra Tech's in-house mailing to deliver the \$100 gift cards to participants after completion of the on-site inspection. Tetra Tech tracked the incentives processed and reported the list of incentive recipients for telephone and Web and on-site inspections on a weekly and ad hoc basis.

3.2 Sampling Strategy

The Tetra Tech team attempted to recruit and complete 70 on-site single-family homes in each of the 10 Economic Development Regions for a total of 700 on-site inspections. The 700 completed on-site inspections were to include 200 new homes (built 2012 and after). The single-family surveys were used to recruit the homes for on-site data collection based on a purely random sampling strategy that targeted a maximum of 70 on-site inspections per region.

Initially, the approach was designed to reach about 50 existing homes (built before 2012) and 20 new homes (2012 and after) in each of the 10 regions. Those quotas for new homes by region could not be achieved because of the differences in amount of new construction by region and the small number of new homes that could be identified in the E2 Working Group utility billing record samples for each region. As a result, the sampling strategy evolved to a more proportional sampling within each region for those two groups. The target of 70 total on-site inspections by region was still used but the proportion of new and existing home completes were more in-line with the proportion of new construction in that region.

The study did not achieve the 90/10 confidence precision level at the regional level within sub-sectors for a variety of reasons including the available sample, poor response rates in some regions, and the need to shift samples to regions where sufficient new construction homes were available. The limitations to participation are discussed in more detail in the Section 2.3. However, when rolled up to the State level and by climate zone, the 90/10 confidence level was met.

3.3 Response Rates

Based on previous experience recruiting for on-site inspections and more recent studies that became available after the work plan was developed for this study, Tetra Tech found that approximately 50 percent of households will agree to an on-site inspection if offered an incentive. Of those who agree to an on-site inspection, past experience recruiting for several residential studies for other utilities has shown that inspectors are only able to schedule and actually get into about 50 percent of the homes that are recruited. In other words, it would take four survey completes to get one on-site inspection completed. As Table 8 shows, those numbers are fairly accurate. A total of 2,947 telephone and Web surveys were completed before reaching the 700 single-family on-site inspection target number of completes. Some regions were more difficult than others to identify and recruit single-family homes for the on-site inspection. For example, Long Island was well below the target of 70 per region with only 53 completed on-site inspections despite multiple mailings, and repeated scheduling and recruiting calls over a number of months.

To meet targets, during the last phase of the projects respondents were asked to contact PSD directly if they were interested in an on-site inspection. Of the total mailings, PSD received 115 email and phones responses through the date of writing this report; from these responses, PSD was able to schedule the 21 on-site inspections needed to reach targets.

Scheduling response rates varied by region. The four most common reasons across all regions for refusing to participate in an on-site inspection were:

- Timing and availability (i.e., the timeframe the on-site inspectors would be in the region did not fit with the respondents availability and/or schedule).
- An unwillingness, especially on the part of working homeowners, to commit to the amount of time required for the on-site inspection.
- The requirement to shut off wood or pellet stoves when they were used as the primary or only source of heat.
- A person in the household responded yes to an on-site inspection at the survey stage, but when called to set up appointment, another party in the household declined to participate in an on-site inspection.
- About 2.8 percent of homes were not eligible to be scheduled for an on-site inspection as they had no or wrong numbers, addresses out of the region or state, or were seasonal residences (column “Not Called” in Table 8).
- The team experienced an overall cancellation rate of 6.3 percent. There were 56 cancellations. This cancellation rate varied significantly by region (ranging from two percent to 17 percent), and by type of construction (6.9 percent for existing homes, 4.5 percent for new homes). However, the highest rates of cancellation were associated with the first few months of the study, which spanned Thanksgiving, Christmas, and New Year and before a change in process as described in the next section. Overall, a total of 700 on-site inspections were completed statewide (Table 9); 518 existing construction and 182 of new construction (Table 10).

Table 8. Disposition of Single Family On-Site Inspection Sample by Region

Final Record Status	Callback	Cancelled	Voicemail	Not Called	Refused	Reschedule	Schedule Won't Fit	Completed	Total
Capital District	20	8	61	5	13	2	7	98	214
Central New York	9	1	59	4	9	1	-	61	144
Finger Lakes	15	1	63	2	8	-	10	76	175
Long Island	17	4	27	-	11	-	4	53	116
Mid-Hudson	17	7	57	8	14	-	4	67	174
Mohawk Valley	13	5	36	4	7	1	7	66	139
New York City	6	2	19		8	1	3	63	102
North Country	16	2	42	10	13	4	10	70	167
Southern Tier	12	12	22	7	14	-	5	70	142
Western New York	15	2	51	4	14	1	12	76	175
Total	140	44	437	44	111	10	62	700	1,548

Table 9. Single Family Completions by Region

Region	Single-Family Survey Completes	Completed On-site Inspections
Southern Tier	250	70
Capital District	416	98
Mohawk Valley	305	66
Mid-Hudson	348	67
Long Island	231	53
New York City	201	63a
Western New York	328	76
Finger Lakes	347	76
Central New York	258	61
North Country	298	70
Total	2,982^a	700

^a Includes mini-surveys conducted during 35 on-site inspections in the New York City region

Table 10. Single-Family Survey or On-site Inspection Completes by Construction Type and Climate Zone

Climate Zone	Surveys			On-Site Inspections		
	Existing Construction (before 2012)	New Construction (2012 and after)	Overall Statewide	Existing Construction (before 2012)	New Construction (2012 and after)	Overall Statewide
Climate zone 4	489	22	511	120	11	131
Climate zone 5	1,021	481	1,502	223	124	347
Climate zone 6	813	156	969	175	47	222
Total state	2,323	659	2,982	518	182	700

3.4 Weighting

By understanding how many households in the population were assigned to each strata and knowing how many completed surveys were obtained for each strata, the evaluation team developed analysis weights so that the data can be reported accurately for the region and State. The population counts and survey completes are used to weight the telephone and Web survey data to ensure that it accurately reflects the original population distribution by climate zone.

The final weights for the single-family or tenant baseline survey respondents are shown in Table 11.

Table 11. Single-Family On-site Inspection Weights

Climate Zone	Population		Single-Family On-site Inspection Completes		Single-Family On-site Inspection Weights	
	New Construction	Existing Construction	New Construction	Existing Construction	New Construction	Existing Construction
	Number of Units in Single Family Buildings (1-4 units)	Number of Units in Single Family Buildings (1-4 units)	Number of Units in Single Family Buildings (1-4 units)	Number of Units in Single Family Buildings (1-4 units)	Number of Units in Single Family Buildings (1-4 units)	Number of Units in Single Family Buildings (1-4 units)
Climate zone 4	2,689	2,255,727	11	120	244.45	18,797.72
Climate zone 5	5,211	1,874,097	124	223	42.02	8,404.02
Climate zone 6	1,725	740,527	47	175	36.7	4,231.58
Total	9,625	4,870,350	182	518	-	-

3.5 Data Limitations and Suggestions for Future Studies for On-site Data Collection

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

- Using certified and trained staff to conduct the on-site inspections was a definite plus given that health and safety was a major concern while in the home – No complaints were reported by occupants concerning the inspector or the process for the 700 on-site inspections.
- Tetra Tech customized its scheduling tool for this study and it was effective in managing the scheduling and recruiting process for the on-site inspection – Potential recruits for the on-site inspections that were identified during the telephone and Web surveys were easily identified for PSD and GDS using the scheduling tool. The status of on-site inspection recruiting and completes were tracked using the tool to ensure availability of on-site inspectors. Exports allowed for mapping to enhance the effectiveness of scheduling and automated triggered emails to respondents and inspectors further increased the effectiveness, efficiency, and yield of on-site inspection scheduling.
- Inspectors owned their own schedules, meaning that once scheduled, inspectors were responsible for confirming with the homeowner and handling any reschedules of on-site inspections – This process was initiated several weeks into the on-site inspections and is one factor that attributed to the decline in the rate of rescheduling. This process helped to manage inspectors and project costs.
- Support and communication – An expert technical team was available around the clock and inspectors were required to be on weekly check-in calls. This level of communication and support enabled most issues to be resolved either on the spot or very quickly.
- PSD’s data collection tool and process used during the on-site inspection worked very effectively in collecting data on-site while providing security and electronic transfer of the data from the on-site inspections – Inspectors reported how impressed homeowners were to see the use of electronic tablets, and to sign forms and releases on the tablet. The use of a fully electronic tool also enabled a degree of data richness, with embedded photography and the capturing of notes for specific and unique situations, that will greatly aide subsequent in-depth analyses of the data on specific topics.
- Tool designed from user’s perspective – The layout, flow, and functionality of the tool were designed from a field user’s perspective. Inspectors reported that this design allowed them to move through a house rapidly and comprehensively, reducing the burden on homeowners.
- Direct mail of incentives (\$100 Amazon gift cards) to on-site inspection participants worked well for delivery and tracking purposes, despite the extra expense to the evaluation team – Providing the gift cards in bulk to inspectors to hand out after the on-site inspection was complete was changed to accommodate the complex logistics of getting the gift cards to inspectors while in the field. Future studies may be able to go one-step further and provide a fully electronic solution, with an incentive code being sent electronically post-inspection, or even provided on-site at time that the inspection is completed.

- Continuous software updates and software flexibility while preserving data integrity – The tool was updated multiple times during the course of the on-site inspections, with the most significant update occurring within the first few weeks of production. Updates were focused on increasing the efficiency, accuracy, and ease of use of the tool. This responsiveness and adaptability was well-received. A better approach would be to take one region, or a part of a region, as a pilot to work through the issues that live production inevitably surfaces.

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

- Statewide on-site inspections should not be conducted during the winter season, if possible – In addition to the travel difficulties, the ability to conduct blower door tests was compromised by the number of wood stoves and other factors affecting safety and comfort of the home occupants. Homeowners were also reluctant to commit the time or let inspectors into their homes around the holidays. In addition, window air conditioner units and other outdoor equipment were typically inaccessible.
- Information to homeowners – A significant number of homeowners desired some kind of information on the energy performance of their home. Although the on-site inspections were not designed to be energy audits, being able to provide homeowners with some observations specific to their home may increase recruitment rates and reduce the amount of financial incentive required to get on-site to conduct the inspection, thus reducing cost.
- Expand and enhance automated checks – All inspections went through desktop QA. Although this caught many issues, a better approach would be to automate more of the QA and logic checks within the tool itself. For example, there were inconsistencies in the way data was reported including variations in terminology and in comment fields instead of data fields, which slowed down the analysis process at the end of the study.

Level of effort:

- Scheduling – Original estimate for scheduling and associated tasks (updating the scheduling tool, marking completes, responding to inquiries from homeowners and the team) was estimated to take one hour per complete on average. The actual average was 1.4 hours per complete. This was largely because the reporting and tracking requirements.
- On-site inspection and data reporting times – As shown in Table 12, while the final required set of data fields and the use of an all-electronic process provided considerable on-site inspection and reporting time efficiencies, these gains were eclipsed by travel time. Although the available sample was representative of the State’s population, this meant that in order to meet the target number of completed on-site inspections at homes that were at a considerable distance from others still needed to be scheduled. Future studies may wish to consider the balance between evenly covering the whole state versus allowing greater clustering or density to help manage costs.

Table 12. Original Time Estimates for Existing and New Homes

Original Estimates:	Existing Homes	New Homes
On-site Inspection time	3 hours	4 hours
Reporting & modeling	1 hour	2 hours
Travel	1 hour	1 hour
Actual Average Times	Existing Homes	New Homes
On-site Inspection time	2–3 hours	2.5–4.5 hours
Reporting & modeling	0.5 hours	1–2 hours
Travel	2–3 hours	2–3 hours

4 Multifamily Property Manager or Owner Surveys

4.1 Objectives

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

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

4.2 Sampling Strategy

Table 13 lists the completed property manager or owner surveys by region. Not surprisingly, New York City with the vast majority of multifamily dwelling units had the largest number of survey completes.

Table 13. Property Manager or Owner Survey Completes by Region

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

Table 14 shows the number of tenant surveys (Web or telephone) used to generate contacts, the number of completed property manager or owner surveys, and the number of completed on-site inspections by climate zone for comparison purposes.

Table 14. Multifamily Property Owner or Manager Surveys and On-site Inspections by Construction Type and Climate Zone

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

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

4.3 Response Rates

Table 15 shows the disposition and response rates for the property manager or owner surveys. The response rate was 17.5 percent, while the cooperation rate was slightly more than 25 percent.

Table 15. Property Owner or Manager Survey Response Rate

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

4.4 Weighting

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

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

The final weights for the Multifamily Property Owner or Manager Surveys and details on the components weights used are presented in Table 16.

Table 16. Property Owner or Manager Survey Weights

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

4.5 Data Limitations and Suggestions for Future Studies

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

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

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

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

5 Multifamily On-site Data Collection

5.1 Summary of Approach

The approach for multifamily on-site inspections was:

- The property manager or developer or owner was the key contact for on-site inspection data collection including gaining access to a sample of dwelling units. As a result, multifamily (MF) tenants were not recruited individually for on-site inspection data collection during the Web or telephone survey to facilitate the process of gaining access to target number of units while at the site.
- The tenants from existing multifamily buildings who completed telephone or Web surveys were asked for the name and contact information of their property owner or manager. If the tenant did not or could not supply that information, the address was used to look-up any information on the property manager or owner using PLUTO, PropertyShark.com, apartment guide.com, or other similar websites.
- Using all of these sources, the evaluation team was able to complete telephone surveys with more than the target of 200 multifamily property managers or owners—219 property manager or owner telephone surveys were completed. The evaluation team then attempted to recruit the property manager or owner for the on-site inspection and provided the list to GDS to provide additional information and schedule the on-site inspection.
- The GDS recruiters asked the property manager or owner to help the inspectors gain access to collect data from a sample of tenant units as well as collect data on the common areas. The number of tenant units included for on-site inspection data collection in each multifamily building depended on the total number of units in that building. The on-site inspection data collection was expected to average five tenant units in the 50 buildings for a total target of 250 tenant units.
- Property managers or owners for existing multifamily buildings (built before 2012) were sent Amazon gift cards for \$150 plus \$40 for each tenant unit visited by the evaluation team (up to a specified number of units averaging five per multifamily building) for on-site inspection data collection. The property manager had the option of providing some of their incentive (e.g., \$20 gift card to the tenant units inspected) and keeping the remaining gift card.
- Property managers or owners for new multifamily buildings received a \$300 Amazon gift card. The expectation was that the on-site inspection data collection would focus on the whole building and mostly unoccupied tenant units would be used.

- New construction multifamily buildings for the 25 on-site inspection data collection targets were identified based on year of construction—built and occupied after 2012—from Web or telephone surveys with tenants in new construction buildings, telephone surveys with property owners or managers who also own new construction buildings, websites with property data, and other sources. Because of the difficulties in identifying and recruiting property owners of newly constructed multifamily buildings, this 25 building target was reduced. To be representative of the population of multifamily buildings statewide, NYSERDA approved a combined total of 17 additional existing and some new buildings. On-site data collection was successfully completed in a total of 58 existing buildings (281 individual tenant units) and nine newly constructed multifamily buildings. See Table 17 for the geographic distribution of these completions.

As described in the lessons learned section for future studies (Section 5.6), recruiting property managers and collecting on-site data was far more challenging than anticipated, especially in the Downstate area.

5.2 Sampling Strategy

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

For the tenant on-site inspections, property managers completing the telephone survey were recruited for an on-site inspection of the common areas, as well as an average of five tenant units per building. It was not clear what the recruitment success rate would be for multifamily new construction. Therefore, the target number of on-site inspections listed from the RFP was higher than the actual number newly constructed multifamily building on-site inspections completed. With that in mind, the evaluation team closely monitored the response rate in terms of actual completed on-site inspection data collection and increased the number of telephone surveys and property manager identification and outreach or recruitment activities to help ensure the revised on-site inspection data collection targets were met. To entice property managers to make their buildings available for on-site inspections, they were also offered building specific Energy Attribute Reports, in addition to gift cards.

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

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

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

The original sample with target completes by region to reflect the amount of multifamily population is shown in Table 17 along with the actual completes. The numbers of property manager or owner surveys completed are also shown by region with the number of those property manager or owners who agreed to a possible on-site inspection.

Table 17. Multifamily Property Surveys and Recruitment for On-site Inspections, Targets, and Completed On-site Inspections

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

5.3 Response Rates

The evaluation team aggressively pursued all leads in an effort to achieve the targeted number of multifamily existing buildings and new construction on-site inspections. As shown in Table 18, including the 67 actual buildings where on-site inspections were conducted, a total of 363 leads were pursued, yielding a response rate of 18.5 percent. This response rate was only achievable through persistent calling of all contacts and supplemental contacts for each building, often resulting in five or more calls per building.

Table 18. Number of Buildings Pursued by Source of Lead

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

5.4 Weighting

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

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

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

5.5 Data Limitations and Suggestions for Future Studies

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

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

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

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

5.6 Other Lessons Learned

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

Recruitment Lessons and Data Collection Lessons.

5.6.1 Recruitment Lessons

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

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

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

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

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

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

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

5.6.2 Data Collection

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

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

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

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

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

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

6 HVAC Contractor Surveys

6.1 Objective

The HVAC Market Assessment is a key component of the statewide residential baseline study. The purpose of the HVAC Market Assessment is to identify the baseline conditions for residential non-electric heating and water heating equipment, central air conditioning, and heat pumps in New York State. The market assessment describes where the market is now (based on equipment sold or installed in 2012 and after) and what percent of the equipment currently being sold is high efficiency. This information was used to establish more accurate baselines for calculating program energy savings and to support program planning in New York State.

Data to support the market assessment were collected in Web or telephone surveys, on-site inspections, contractor interviews, and distributor sales reports to determine the baseline efficiency of specific types of residential heating and cooling equipment installed in New York. Market channels and specification practices for these technologies were also characterized. This investigation looked at the market differences throughout the State. When a sufficient number of data points are available, the data are presented for the three climate zones.

The study focused on units installed in single-family homes and in multifamily buildings with 1 to 4 units, or in townhouse type configurations where individual units have their own heating systems. Multifamily units with five or more units typically have central systems served by the commercial equipment contractors, and were not part of this assessment. The purposes of the HVAC contractor interviews were to determine the efficiency level of equipment currently being installed and gauge common practices in the HVAC installer and service market. Additionally, the interviews examined levels of awareness with respect to problems resulting from over sizing, leaky ducts, air distribution system design, and charging deficiencies. Elements of common practice explored included, but were not limited to:

- Practice, techniques, and experiences with sizing new systems and retrofit systems.
- Designing, installing, replacing, and fixing air distribution systems.
- Recommending and specifying system efficiencies.
- Diagnosing techniques for ensuring adequate system refrigerant charging.

Data were provided to NYSERDA from D&R International through an agreement with Heating Air-conditioning & Refrigeration Distributors International (HARDI). D&R provided estimates of annual sales data for 2013 for central air conditioners, central heat pumps, furnaces, and boilers. The HARDI data was used to estimate the percentage sales by efficiency level for those equipment types. In addition, 2009 U.S. Census data and telephone and Web surveys reporting type and age of equipment were used to confirm the annual HARDI sales data reported by D&R. Further, equipment type and efficiency levels of equipment reported from the on-site inspection data for new single-family homes and new equipment (2012 and after) were also used as a comparison to HVAC contractor survey reports and HARDI data.

The approach included a combination of cold calling by a Tetra Tech scheduler and emailing, when email addresses were available. The calling began May 5, 2014, by one of Tetra Tech's senior interviewers. Due to the low response rate after one month of calling, Tetra Tech revised the letter requesting participation. NYSERDA mailed these letters in early June 2014. A few additional HVAC Contractor Surveys were completed that seemed to be helped by the mailing. Due to very low response rates, calling was suspended as of July 14, 2014, for the summer season, when the HVAC contractors were very busy and non-responsive. On September 8, 2014, calling resumed for HVAC contractor interviews with a team of consultants and experienced interviewers, a streamlined survey instrument, additional sample, and a more compelling script for the letter and email introduction. The HVAC contractor calling continued through September 25, 2014.

The decision was made to not include a financial incentive (e.g., a gift card) to the HVAC contractors for completing the survey. They were offered an aggregate summary of the key results of the HVAC Contractor Surveys as a non-financial incentive.

6.2 Sampling Strategy

The source of the HVAC contractor population and sample for telephone surveys were identified through <http://companies.findthebest.com/>. Using <http://companies.findthebest.com/>, the evaluation team was able to identify more than 18,000 contractors within New York State who fit into the target group for the HVAC market assessment. In addition, the database included, and could be sorted by, the number of employees and annual sales volume. Tetra Tech reviewed other HVAC contractor list sources, but a number of these other sources were not comprehensive. For example, some limited their lists to those HVAC businesses with NATE (North American Technician Excellence) certification. The Yellow Pages (<http://www.yellowpages.com/>) was also fairly comprehensive, but did not include data to indicate company size.

The initial sample was drawn from <http://companies.findthebest.com/database> from each of the three climate zones. Slightly more than 90 percent of the population of HVAC contractors listed in the database are considered small businesses with ten or less employees.

The sampling strategy established targets of 20 (10 small and 10 large) for each climate zone with at least one large contractor and one small contractor in each of the 10 regions to ensure statewide representation. If there were multiple climate zones in a region, the targets included at least one from each climate zone in the region. The targets were somewhat proportional to the population of residential homes, which should be somewhat representative of the equipment sold in that county or region. The sampling was adjusted for locations such as North Country where there are few, if any, large HVAC businesses.

The HVAC contractor sample lists were developed manually by pulling up individual counties in the <http://companies.findthebest.com/> database because the system did not allow for a download of a list of contractors. Counties with the largest populations of residential households were drawn first to provide the largest number of HVAC contractor sample. The final number of contractors are shown in Table 19.

Table 19. Population of HVAC Contractors in New York State

Source: companies.findthebest.com/ Construction: Specialty Trade Contractors > Building Equipment Contractors > Plumbing, Heating, and Air-Conditioning Contractors

Climate Zone	Population of NYS HVAC Contractors		HVAC Contractor Survey Responses	
	Large Contractors (more than 10 employees)	Small Contractors (0–10 employees)	Large Contractors	Small Contractors
Climate zone 4	1,338	13,160	8	8
Climate zone 5	302	2,802	9	5
Climate zone 6	46	582	1	15
Total	1,686	16,544	18	28

Although <http://companies.findthebest.com/> was deemed the most comprehensive data set, there were still a high number of ineligible in the sample drawn from that database. Ineligible businesses included: (a) sold commercial equipment only, (b) did not sell any of the equipment in the HVAC assessment, (c) out of business or retired, or (d) deceased. Over 20 percent of the large contractors were ineligible for the study as shown in Table 20.

Table 20. Total Sample Count and Ineligible Subset Count by Climate Zone

Type	Climate Zone 4			Climate Zone 5			Climate Zone 6			Overall Statewide		
	Sample Count	Ineligible Count	Ineligible Percent	Sample Count	Ineligible Count	Ineligible Percent	Sample Count	Ineligible Count	Ineligible Percent	Sample Count	Ineligible Count	Ineligible Percent
Large	300	64	21%	89	21	24%	83	22	27%	472	107	23%
Small	186	16	9%	133	12	9%	111	15	14%	430	43	10%
Total	486	80	16%	222	33	15%	194	37	19%	902	150	17%

6.3 Response Rates

After one month of calling, Tetra Tech's senior interviewer had completed eight interviews with three more interviews that still needed the HVAC contractor to send in the equipment sales and efficiency data. To calculate a very rough response rate in early July, the response rate was about three percent (17 completes/640 sample).

As of July 9, 18 full completes and nine partial completes (needing sales and efficiency data tables) were done with 284 hours, so over 10 hours of interviewer time per complete. The total hours including recruiting were over 400 for this task.

As of July 14, 2014, the HVAC contractor calling was suspended until September 8, 2014, because the summer cooling season was at its peak and the response rates were minimal.

The response rates continued to be very low through the survey as shown in this summary that reported on one of the last months of calling, which was September 2014. Tetra Tech was using experienced consultants and interviewers to do the calling with the following results:

- Made over 1,000 unique calls in September.
- Completed 19 total interviews, and collected another three partial interviews.
- Partial completes typically are missing sales data, which was especially difficult for small business owners to produce.

Table 21 highlights the difficulty of contacting and completing calls with this particular population when calling resumed in September.

Table 21. HVAC Contractor Calling (September 2014) Response Rates

	Climate Zone 4 – Large & Small	Climate Zone 5 – Large & Small	Climate Zone 6 – Large & Small	Overall Statewide
Number of cases attempted	367	124	121	612
New cases not attempted	33	0	0	33
Number of calls made	469	201	402	1,072
Number of emails/faxes sent	13	50	30	93
Cases finalized	244	6	28	278
Completed interviews	11	4	4	19
Completed Interview - partial	0	1	2	3
Hours used	46	24	56	126
Response rate	3.0%	4.0%	5.0%	3.6%

The overall barriers to completing HVAC Contractor Surveys were identified by the interviewers:

- Contractors very rarely returned any voicemails or emails.
- Contractors in general are active, in the field, and focused on customer service. It is difficult to get their attention or time.
- Interviewers were at the mercy of weather or other active times that created windows of contractor unavailability (due to customer call volume or field work).

The specific barriers for small HVAC contractor firm included:

- The owner is often the only person with key data. These owners are often (a) extremely busy, and (b) in the field all day.
- Small HVAC contractors are difficult to reach and their cell number was not available in the sample file. This presented challenges in reaching key contacts during the day. Getting cell numbers of contractors from answering machines or services occasionally yielded a completed survey after additional dials.
- Small businesses within the sample files frequently use answering services. Messages left with these services or contacts were not returned.

The specific barriers for large HVAC contractor firms included:

- Key interviewees at large HVAC companies are often difficult to reach because he or she is not the individual answering the phone; calls are often fielded by a receptionist. The interviewer often did not get to have that initial conversation with a large HVAC contractor in question. Messages are rarely returned.
- Companies that appear to be “large” (more than 10 employees) in the sample file (from FindtheBest) were not large contractors. They did not have enough employees to qualify as a completed “large” interview (that problem was especially apparent in climate zone 6).
- Large companies in the sample file were often commercial-only businesses, and not ultimately eligible for this study. Again, this barrier was especially apparent in climate zone 6.

6.4 Weighting

The Tetra Tech evaluation team attempted to weight the responses by using the size of the HVAC contractor (one to 10 employees for small and over 10 employees for large contractors) and the number of each of those businesses in each county. When the weights were applied to the annual sales reported by the HVAC contractors and rolled up, the total sales appeared to be two to four times what was being reported for 2013 HARDI annual sales by D&R International. The conclusion was that the HVAC contractors likely over-reported their annual sales since the HARDI data was confirmed as reasonable by other sources. For that reason, the decision was made to simply report unweighted responses by the two types of businesses—large and small contractors.

6.5 Data Limitations and Suggestions for Future Studies

The following were elements of the methodology that worked well for the HVAC Market Assessment:

- The FindtheBest database was effective in identifying the complete population of HVAC contractors throughout New York State. The database allowed for stratifying by large contractors and small contractors. In addition, the population could be summarized by county and subsequently by climate zone.
- The approach of using triangulation of various data sources—HVAC Contractor Surveys, HARDI data, and on-site inspection data collection at single-family homes—was effective in confirming data and identifying questionable results.

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

- More resources should be devoted to developing sample lists from FindtheBest including pre-screening to ensure size of business and eligibility.
- Emails and mailings should be sent out, preferably from NYSERDA, to introduce HVAC contractors to the study and engage their cooperation. A possible value proposition may be complimentary passes to training sessions.
- The annual sales data may have been overstated by individual HVAC contractors. Future studies should continue to include HARDI data for annual sales and possibly for efficiency levels. Water heaters should be added if possible.
- The survey covered many different topics and was at least a half hour or longer, depending on the number of equipment types, out of the busy day for an HVAC contractor. A separate survey should be conducted to gather just the information on sales and efficiency levels of installed equipment in the future, especially as new equipment standards are announced and implemented. In addition, repeating that portion of the survey and a few other questions would allow NYSERDA to track market effects from market transformation activities.

7 Data Tables from Telephone and Web Surveys and On-site Inspections

This section contains a high-level summary of the data collected in the Residential Statewide Baseline study. The intention is to enable readers to appraise these supplemental data tables in conjunction with the report volumes that comprise this study.

The data consist of (1) the quantitative data from the study telephone and Web surveys, and (2) a summary of the quantitative and qualitative data collected during the on-site inspections.

The data are presented in table format with brief explanations of the survey instrument, question and respondent type.

Table 22. Statewide: Household Members Work Primarily from Home by Climate Zone

Source: Single-Family and Tenant survey questions A11 and A11b.

		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Household members primarily work from home	Yes	16.5%	11.7%	10.7%	13.7%
	No	83.5%	88.3%	89.3%	86.3%
	Respondents (n)	508	1,500	968	2,976
Number of people work from home	Mean	1.2	1.2	1.3	1.2
	Respondents (n)	85	186	99	370

Table 23. Household Members Work Primarily from Home by Construction Type

Source: Single-Family and Tenant survey questions A11 and A11b.

		New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Household members primarily work from home	Yes	15.3%	13.7%	13.7%
	Respondents (n)	659	2,317	2,976
Number of people work from home	Mean	1.2	1.2	1.2
	Respondents (n)	84	286	370

Table 24. Statewide: Number of Household Members by Age by Climate Zone*Source: Single-Family and Tenant survey question D2.*

Age Category		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 5 years	Mean	0.2	0.2	0.1	0.2
	Respondents (n)	473	1,494	957	2,924
6 to 17 years	Mean	0.5	0.4	0.4	0.4
	Respondents (n)	473	1,494	957	2,924
18-24 years	Mean	0.3	0.2	0.2	0.2
	Respondents (n)	473	1,494	957	2,924
25-34 years	Mean	0.4	0.4	0.3	0.4
	Respondents (n)	473	1,494	957	2,924
35-44 years	Mean	0.4	0.3	0.3	0.3
	Respondents (n)	473	1,494	957	2,924
45-54 years	Mean	0.5	0.4	0.4	0.4
	Respondents (n)	473	1,494	957	2,924
55-64 years	Mean	0.5	0.4	0.5	0.4
	Respondents (n)	473	1,494	957	2,924
65 years or older	Mean	0.4	0.4	0.4	0.4
	Respondents (n)	473	1,494	957	2,924
Total Household Members	Mean	3.1	2.5	2.5	2.8
	Respondents (n)	473	1,494	957	2,924

Table 25. Number of Household Members by Age by Construction Type*Source: Single-Family and Tenant survey question D2.*

Age Category		New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Less than 5 years	Mean	0.4	0.2	0.2
	Respondents (n)	656	2,268	2,924
6 to 17 years	Mean	0.5	0.4	0.4
	Respondents (n)	656	2,268	2,924
18-24 years	Mean	0.1	0.2	0.2
	Respondents (n)	656	2,268	2,924
25-34 years	Mean	0.4	0.4	0.4
	Respondents (n)	656	2,268	2,924
35-44 years	Mean	0.4	0.3	0.3
	Respondents (n)	656	2,268	2,924
45-54 years	Mean	0.4	0.4	0.4
	Respondents (n)	656	2,268	2,924
55-64 years	Mean	0.4	0.4	0.4
	Respondents (n)	656	2,268	2,924
65 years or older	Mean	0.3	0.4	0.4
	Respondents (n)	656	2,268	2,924
Total Household Members	Mean	2.9	2.8	2.8
	Respondents (n)	656	2,268	2,924

Table 26. Statewide: Highest Level of Education by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question D3.

Education	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than high school	0.4%	0.4%	0.5%	0.4%
Some high school	0.9%	0.6%	0.2%	0.7%
High school graduate or equivalent (e.g., GED)	11.1%	12.6%	15.5%	12.4%
Trade or technical school (e.g. Associate's degree)	4.6%	9.4%	12.4%	7.8%
Some college, no degree	11.3%	12.4%	14.3%	12.2%
College degree (e.g. Bachelor's degree)	26.3%	30.6%	28.0%	28.3%
Some graduate school	4.0%	4.7%	4.5%	4.3%
Graduate degree (e.g. Masters or Doctorate degree)	41.4%	29.3%	24.7%	33.9%
Respondents (n)	474	1,496	964	2,934

Table 27. Highest Level of Education by Construction type

Totals may not sum to 100 percent due to rounding

Source: Single-Family and Tenant survey question D3.

Education	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Less than high school	0.2%	0.4%	0.4%
Some high school	0%	0.7%	0.7%
High school graduate or equivalent (e.g., GED)	5.4%	12.4%	12.4%
Trade or technical school (e.g. Associate's degree)	5.7%	7.8%	7.8%
Some college, no degree	9.6%	12.2%	12.2%
College degree (e.g. Bachelor's degree)	31.6%	28.3%	28.3%
Some graduate school	3.3%	4.3%	4.3%
Graduate degree (e.g. Masters or Doctorate degree)	44.2%	33.9%	33.9%
Respondents (n)	654	2,280	2,934

Table 28. Annual Household Income by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions D4 and B3.

Income	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Less than \$25,000	1.1%	10.6%	10.5%
\$25,000 to less than \$30,000	0.6%	5.4%	5.4%
\$30,000 to less than \$35,000	1.3%	6.1%	6.1%
\$35,000 to less than \$50,000	7.7%	13.0%	13.0%
\$50,000 to less than \$75,000	13.8%	19.0%	19.0%
\$75,000 to less than \$100,000	14.2%	15.8%	15.8%
\$100,000 to less than \$150,000	34.1%	15.5%	15.5%
\$150,000 to less than \$200,000	7.7%	6.0%	6.0%
\$200,000 or more	19.5%	8.7%	8.7%
Respondents (n)	547	1,971	2,518

Table 29. Statewide: Number of Stories by Climate Zone

Source: Single-Family and Tenant survey question B3c.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	3.8	2.1	2.1	3.1
Respondents (n)	71	92	49	212

Table 30. Number of Stories by Construction Type

Source: Single-Family and Tenant survey question B3c.

	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Mean	2.8	3.1	3.1
Respondents (n)	5	207	212

Table 31. Statewide: Retail Space in Building by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question B3d.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	9.9%	10.2%	6.1%	9.7%
No	90.1%	89.8%	93.9%	90.3%
Respondents (n)	71	93	49	213

Table 32. Statewide: Major Renovation in Past Five Years by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question B8.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	13.3%	12.0%	14.1%	12.9%
No	86.7%	88.0%	85.9%	87.1%
Respondents (n)	457	1,465	952	2,874

Table 33. Statewide: More than one Electric Meter at Address by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question B9.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	7.1%	4.2%	5.3%	5.5%
No	92.9%	95.8%	94.7%	94.5%
Respondents (n)	318	1,273	883	2,474

Table 34. Statewide: Electric Utility Provider by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question S5.

Electric Utility	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Central Hudson	0%	4.8%	3.1%	2.3%
ConEd	53.3%	0%	0%	24.7%
LIPA	45.2%	0%	0%	20.9%
National Grid	0%	46.6%	51.5%	25.8%
NYSEG	1.4%	27.2%	44.3%	17.9%
O&R	0%	5.2%	0.4%	2.1%
RG&E	0%	16.2%	0.7%	6.3%
Respondents (n)	511	1,502	969	2,982

Table 35. Statewide: Natural Gas Provider by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question U1a.

Natural Gas Provider	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
National Grid	52.6%	30.3%	35.1%	41.3%
Consolidated Edison Company Of N Y, Inc.	28.3%	0%	0%	13.3%
New York State Electric & Gas Corporation	0.4%	12.6%	33.3%	8.8%
Rochester Gas & Electric Corporation	0%	17.6%	0.4%	7.7%
National Fuel Gas Distribution Corporation	0%	15.6%	2.1%	7.0%
Keyspan Energy Delivery (Long Island)	7.8%	0%	0%	3.6%
Other, specify	3.9%	3.2%	1.8%	3.4%
Keyspan Energy Delivery (New York)	4.9%	0%	0%	2.3%
National Fuel Resources, Inc	0%	3.9%	0%	1.7%
New York Gas & Electric	1.1%	2.1%	2.8%	1.7%
Orange And Rockland Utilities, Inc.	0%	3.8%	0%	1.7%
Ambit New York, LLC	0%	2.1%	4.2%	1.3%
Central Hudson Gas & Electric Corporation	0%	1.8%	2.1%	1.0%
Just Energy	0%	1.2%	2.5%	0.8%
Agway Energy Services, LLC	0%	1.2%	1.4%	0.7%
Gateway Energy Services Corporation	0.4%	0.8%	1.1%	0.6%
Direct Energy Services, LLC	0%	0.9%	1.8%	0.6%
Corning Natural Gas Corporation	0%	0.3%	4.6%	0.6%
St. Lawrence Gas Company, Inc.	0%	0%	4.6%	0.4%

Table 35 continued

Natural Gas Provider	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Noco Natural Gas LLC	0%	0.6%	0%	0.3%
North American Power And Gas, LLC	0%	0.5%	0.4%	0.2%
Energy Cooperative Of America, Inc.	0%	0.5%	0.4%	0.2%
Constellation Energy Gas Choice, Inc.	0.4%	0%	0.4%	0.2%
Utility Expense Reduction LLC	0.4%	0%	0%	0.2%
Major Energy Services	0%	0.3%	0%	0.1%
Family Energy Inc.	0%	0.3%	0%	0.1%
Reserve Gas Company, Inc.	0%	0.2%	0%	0.1%
IGS Energy	0%	0.2%	0%	0.1%
Alpha Gas And Electric, LLC	0%	0.2%	0%	0.1%
American Power & Gas LLC	0%	0%	0.4%	0%
IDT Energy, Inc.	0%	0%	0.4%	0%
New Wave Energy Corp.	0%	0%	0.4%	0%
Hiko Energy LLC	0%	0%	0.4%	0%
Hudson Energy Services, LLC	0%	0%	0%	0%
Filmore Gas Company, Inc.	0%	0%	0%	0%
Energy Plus Natural Gas LLC	0%	0%	0%	0%
Bluerock Energy, Inc.	0%	0%	0%	0%
Respondents (n)	293	1,018	315	1,626

Table 36. Natural Gas Provider by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question U1a.

Natural Gas Provider	New Construction - built 2012 or later	Existing Construction - built prior to 2012	Overall statewide
National Grid	41.4%	41.3%	41.3%
Consolidated Edison Company Of N Y, Inc.	11.3%	13.3%	13.3%
New York State Electric & Gas Corporation	5.2%	8.8%	8.8%
Rochester Gas & Electric Corporation	12.6%	7.7%	7.7%
National Fuel Gas Distribution Corporation	12.0%	7.0%	7.0%
Keyspan Energy Delivery (Long Island)	0%	3.7%	3.6%
Other, specify	0.4%	3.4%	3.4%
Keyspan Energy Delivery (New York)	0%	2.3%	2.3%
National Fuel Resources, Inc	2.4%	1.7%	1.7%
New York Gas & Electric	0.6%	1.7%	1.7%
Orange And Rockland Utilities, Inc.	4.0%	1.7%	1.7%
Ambit New York, LLC	2.2%	1.3%	1.3%
Central Hudson Gas & Electric Corporation	3.8%	1.0%	1.0%
Just Energy	0.2%	0.8%	0.8%
Agway Energy Services, LLC	0.4%	0.7%	0.7%
Gateway Energy Services Corporation	0.2%	0.6%	0.6%
Direct Energy Services, LLC	0.2%	0.6%	0.6%
Corning Natural Gas Corporation	0%	0.6%	0.6%
St. Lawrence Gas Company, Inc.	0.2%	0.4%	0.4%
Noco Natural Gas LLC	0.4%	0.3%	0.3%
North American Power And Gas, LLC	0.2%	0.2%	0.2%
Energy Cooperative Of America, Inc.	0.2%	0.2%	0.2%
Constellation Energy Gas Choice, Inc.	0%	0.2%	0.2%
Utility Expense Reduction LLC	0%	0.2%	0.2%
Major Energy Services	0%	0.1%	0.1%
Family Energy Inc.	0%	0.1%	0.1%
Reserve Gas Company, Inc.	0.2%	0.1%	0.1%
IGS Energy	0%	0.1%	0.1%
Alpha Gas And Electric, LLC	0%	0.1%	0.1%
American Power & Gas LLC	0.6%	0%	0%
IDT Energy, Inc.	0.4%	0%	0%
New Wave Energy Corp.	0%	0%	0%
Hiko Energy LLC	0%	0%	0%

Table 36 continued

Natural Gas Provider	New Construction - built 2012 or later	Existing Construction - built prior to 2012	Overall statewide
Hudson Energy Services, LLC	0.4%	0%	0%
Filmore Gas Company, Inc.	0.2%	0%	0%
Energy Plus Natural Gas LLC	0.2%	0%	0%
Bluerock Energy, Inc.	0.2%	0%	0%
Respondents (n)	398	1,228	1,626

Table 37. Statewide: Who Pays for Natural Gas by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question U1.

Natural Gas Provider	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Pay directly to natural gas company	78.6%	94.7%	88.9%	84.5%
Natural gas included in rent or condo fee	21.4%	5.3%	11.1%	15.5%
Respondents (n)	98	137	54	289

Table 38. Who Pays for Natural Gas by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question U1.

Natural Gas Provider	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Pay directly to natural gas company	100%	84.5%	84.5%
Natural gas included in rent or condo fee	0%	15.5%	15.5%
Respondents (n)	4	285	289

Table 39. Statewide: Natural Gas Available on Street by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question U2a.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	71.2%	87.4%	93.1%	83.5%
Yes	28.8%	12.6%	6.9%	16.5%
Respondents (n)	114	374	568	1,056

Table 40. Natural Gas Available on Street by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question U2b.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	69.9%	55.9%	64.5%	65.4%
Yes	30.1%	44.1%	35.5%	34.6%
Respondents (n)	31	41	34	106

Table 41. Interested in Converting to Natural Gas by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question U2b.

	New Construction - built 2012 or later	Existing Construction - built prior to 2012	Overall statewide
No	37.6%	65.5%	65.4%
Yes	62.4%	34.5%	34.6%
Respondents (n)	11	95	106

Table 42. Statewide: Average Number of Fireplaces by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question H7.

Fireplace Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Wood	0.2	0.2	0.2	0.2
	464	1,469	941	2,874
Natural gas	0.1	0.1	0.1	0.1
	464	1,469	941	2,874
Propane	0	0.0	0.1	0.0
	464	1,326	739	2,529
Electric	0	0.1	0.1	0.1
	464	1,469	941	2,874

Table 43. Average Number of Fireplaces by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question H7.

Fireplace Type	New Construction - Built 2012 or later	Existing Construction - Built Prior to 2012	Overall Statewide
Wood	0.2	0.2	0.2
	645	2,229	2,874
Natural gas	0.4	0.1	0.1
	645	2,229	2,874
Propane	0.1	0	0
	644	1,885	2,529
Electric	0.1	0.1	0.1
	645	2,229	2,874

Table 44. Statewide: Heating System ENERGY STAR Rated by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question H5.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	77.9%	73.6%	66.0%	74.1%
No	22.1%	26.4%	34.0%	25.9%
Respondents (n)	153	762	388	1,303

Table 45. Heating System ENERGY STAR Rated by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question H5.

	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Yes	91.9%	74.0%	74.1%
No	8.1%	26.0%	25.9%
Respondents (n)	522	781	1,303

Table 46. Statewide: Average Number of Other Heating Sources by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question H7.

Heating Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Heat stove	0.1	0.1	0.2	0.1
	454	1,415	930	2,799
Portable electric heater	0.3	0.4	0.5	0.4
	454	1,415	930	2,799
Portable kerosene heater	0	0	0	0
	454	1,415	930	2,799

Table 47. Average Number of Other Heating Sources by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question H7.

Heating Type	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Heat stove	0.1	0.1	0.1
	601	2,198	2,799
Portable electric heater	0.2	0.4	0.4
	601	2,198	2,799
Portable kerosene heater	0	0	0
	601	2,198	2,799

Table 48. Statewide: Average Room or Window Air Conditioners by Climate Zone*Source: Single-Family and Tenant survey question H17.*

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	2.7	2.0	1.8	2.3
Respondents (n)	251	479	455	1,185

Table 49. Average Room or Window Air Conditioners by Construction Type*Source: Single-Family and Tenant survey question H17.*

	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Mean	1.7	2.3	2.3
Respondents (n)	61	1,124	1,185

Table 50. Statewide: Average Ventilation Equipment by Climate Zone*Source: Single-Family and Tenant survey question H27.*

Ventilation Type		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Ceiling fans	Mean	1.8	1.9	1.9	1.9
	Respondents (n)	472	1,491	965	2,928
Kitchen exhaust fans	Mean	0.7	0.7	0.7	0.7
	Respondents (n)	472	1,491	965	2,928
Bathroom exhaust fans	Mean	1.1	1.3	1.2	1.2
	Respondents (n)	472	1,491	965	2,928
Attic fans	Mean	0.2	0.1	0.1	0.2
	Respondents (n)	472	1,491	965	2,928
Whole house fans	Mean	0.1	0.1	0	0.1
	Respondents (n)	472	1,491	965	2,928

Table 51. Average Ventilation Equipment by Construction Type

Source: Single-Family and Tenant survey question H27.

Ventilation Type		New Construction – (Built 2012 or Later)	Existing Construction – (Built prior to 2012)	Overall Statewide
Ceiling fans	Mean	2.5	1.9	1.9
	Respondents (n)	660	2,268	2,928
Kitchen exhaust fans	Mean	0.9	0.7	0.7
	Respondents (n)	660	2,268	2,928
Bathroom exhaust fans	Mean	2.5	1.2	1.2
	Respondents (n)	660	2,268	2,928
Attic fans	Mean	0.1	0.2	0.2
	Respondents (n)	660	2,268	2,928
Whole house fans	Mean	0.1	0.1	0.1
	Respondents (n)	660	2,268	2,928

Table 52. Statewide: Presence of Programmable Thermostat by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H19 and H20.

		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Have programmable thermostat	Yes	71.3%	68.1%	53.5%	67.2%
	No	28.7%	31.9%	46.5%	32.8%
	Respondents (n)	474	1,498	968	2,940
Use of programmable thermostat	Programmed to change temperature automatically	54.8%	46.1%	41.6%	49.6%
	Manually change the temperature	27.2%	36.8%	42.5%	33.0%
	Both	18.0%	17.2%	15.9%	17.4%
	Respondents (n)	343	1,147	553	2,043

Table 53. Presence of Programmable Thermostat by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H19 and H20.

		New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Have programmable thermostat	Yes	90.4%	67.2%	67.2%
	Respondents (n)	658	2,282	2,940
Use of programmable thermostat	Programmed to change temperature automatically	50.3%	49.6%	49.6%
	Manually change the temperature	31.1%	33.0%	33.0%
	Both	18.6%	17.4%	17.4%
	Respondents (n)	594	1,449	2,043

Table 54. Statewide: Presence of Programmable Thermostat by Fuel Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H19 and H20.

		Natural Gas	Oil	Propane	Electricity	Other	Overall Statewide
Have programmable thermostat	Yes	76.6%	66.3%	61.9%	56.7%	45.5%	69.6%
	Respondents (n)	1,468	469	379	197	301	2,814
Use of programmable thermostat	Programmed to change temperature automatically	51.6%	52.1%	34.6%	43.6%	40.9%	49.8%
	Manually change the temperature	29.7%	31.9%	40.7%	48.2%	45.6%	32.6%
	Both	18.6%	16.0%	24.7%	8.2%	13.5%	17.6%
	Respondents (n)	1,166	288	264	111	154	1,983

Table 55. Statewide: Type of Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question WH2.

Water Heater Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Stand-alone storage tank	58.7%	85.9%	78.0%	73.3%
Tankless or on demand water heater	5.3%	4.8%	5.6%	5.1%
Heat pump water heater	4.7%	1.3%	2.8%	2.9%
Part of the heating system boiler	31.4%	7.9%	13.0%	18.4%
Other, specify	0%	0.1%	0.7%	0.2%
Respondents (n)	384	1,384	907	2,675

Table 56. Type of Water Heating System by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question WH2.

Water Heater Type	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Stand-alone storage tank	67.7%	73.3%	73.3%
Tankless or on demand water heater	21.1%	5.1%	5.1%
Heat pump water heater	2.4%	2.9%	2.9%
Part of the heating system boiler	8.9%	18.5%	18.4%
Other, specify	0%	0.2%	0.2%
Respondents (n)	633	2,042	2,675

Table 57. Statewide: Type of Water Heating System by Water Heater Fuel

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH2 and WH3.

Water Heater Type	Electricity	Natural Gas From Underground Pipes	Propane (Bottled Gas)	Fuel Oil	Kerosene	Solar	Other, Specify	Overall Statewide
Stand-alone storage tank	85.9%	82.9%	72.3%	36.6%	39.9%	0.5%	16.4%	73.8%
Tankless or on demand water heater	3.1%	3.9%	16.0%	5.8%	19.9%	2.6%	0%	5.0%
Heat pump water heater	4.5%	2.7%	1.7%	1.3%	0%	97.0%	0.1%	2.8%
Part of the heating system boiler	6.4%	10.4%	10.0%	56.0%	40.2%	0%	68.0%	18.3%
Other, specify	0.1%	0%	0%	0.3%	0%	0%	15.5%	0.2%
Respondents (n)	682	1,292	339	270	4	4	32	2,623

Table 58. Statewide: Age of Primary Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question WH4.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	18.9%	13.6%	12.3%	15.6%
2 to 4 years old	15.4%	22.8%	20.8%	19.4%
5 to 9 years old	35.0%	31.2%	32.0%	32.9%
10 to 14 years old	17.6%	20.5%	19.2%	19.1%
15 to 19 years old	6.0%	5.4%	7.3%	6.0%
20 years old or more	7.1%	6.4%	8.4%	7.0%
Respondents (n)	373	1,362	882	2,617

Table 59. Age of Primary Water Heating System by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question WH4.

Age	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Less than 2 years old	87.2%	15.4%	15.6%
2 to 4 years old	12.6%	19.4%	19.4%
5 to 9 years old	0.2%	33.0%	32.9%
10 to 14 years old	0%	19.2%	19.1%
15 to 19 years old	0%	6.0%	6.0%
20 years old or more	0%	7.1%	7.0%
Respondents (n)	657	1,960	2,617

Table 60. Statewide: Age of Primary Water Heating System by Water Heater Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH2 and WH4.

Age	Stand- Alone Storage Tank	Tankless or On- Demand Water Heater	Heat pump Water Heater	Part of the Heating System Boiler	Other, Specify	Overall Statewide
Less than 2 years old	15.8%	22.0%	22.6%	10.5%	0%	15.3%
2 to 4 years old	18.4%	36.8%	18.6%	18.5%	66.8%	19.5%
5 to 9 years old	34.2%	30.8%	29.8%	31.9%	0%	33.4%
10 to 14 years old	20.0%	6.3%	19.6%	18.1%	0%	18.9%
15 to 19 years old	6.0%	0.9%	8.4%	7.2%	0%	6.0%
20 years old or more	5.6%	3.2%	0.9%	13.8%	33.2%	6.8%
Respondents (n)	1,915	209	63	326	2	2,515

Table 61. Statewide: Primary Water Heater ENERGY STAR Rated by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH5.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	87.4%	80.8%	82.6%	83.6%
No	12.6%	19.2%	17.4%	16.4%
Respondents (n)	155	720	388	1,263

Table 62. Primary Water Heater ENERGY STAR Rated by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH5.

	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Yes	92.9%	83.6%	83.6%
No	7.1%	16.4%	16.4%
Respondents (n)	400	863	1,263

Table 63. Existing Construction: Water Heating Fuel by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH3.

Water Heating Fuel Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Natural gas from underground pipes	55.8%	61.9%	28.8%	53.8%
Electricity	9.8%	21.5%	41.5%	20.1%
Fuel Oil	33.1%	6.8%	10.7%	18.2%
Propane (bottled gas)	1.1%	9.1%	17.1%	7.2%
Other, specify	0%	0.4%	1.4%	0.4%
Solar	0.3%	0.1%	0.1%	0.2%
Kerosene	0%	0.1%	0.4%	0.1%
Respondents (n)	369	952	778	2,099

Table 64. Statewide: Water heater Year of Manufacture from On-site Inspections

Totals may not sum to 100 percent due to rounding. Data not captured or N/As were dropped from this analysis.

Source: Single-family on-site inspection question DHW_equipment_year.

Water Heater Year of Manufacture	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
1970	0%	0.5%	0%	0.2%
1980	2.6%	0%	0.6%	1.3%
1984	0%	0%	0.6%	0.1%
1985	0.9%	0%	0.6%	0.5%
1986	0.9%	0%	0%	0.4%
1987	0.9%	0.5%	0%	0.6%
1988	1.7%	0%	0%	0.8%
1989	0.9%	0%	2.3%	0.8%
1990	3.4%	1.4%	1.2%	2.3%
1991	0%	0%	1.7%	0.3%
1992	0%	1.8%	0%	0.7%
1993	1.7%	0%	0%	0.8%
1994	2.6%	1.4%	0%	1.7%
1995	0.9%	2.3%	2.9%	1.7%
1996	0.9%	1.4%	2.3%	1.3%
1997	0.9%	0.9%	0.6%	0.8%
1998	1.7%	4.1%	2.9%	2.8%
1999	1.7%	2.3%	2.9%	2.1%
2000	6.9%	6.9%	7.0%	6.9%
2001	0.9%	2.3%	2.3%	1.6%
2002	0.9%	3.7%	1.7%	2.1%
2003	3.4%	5.0%	2.9%	4.0%
2004	7.8%	5.5%	4.6%	6.4%
2005	5.2%	5.9%	5.2%	5.5%
2006	4.3%	9.1%	7.5%	6.7%
2007	2.6%	3.7%	3.5%	3.1%
2008	9.5%	5.9%	8.7%	8.0%
2009	8.6%	6.9%	2.3%	7.0%
2010	6.0%	7.3%	8.7%	6.9%
2011	6.1%	9.6%	7.0%	7.6%
2012	7.8%	6.2%	9.5%	7.4%
2013	6.9%	5.5%	10.5%	6.9%
2014	1.7%	0%	0%	.8%
Respondents (n)	125	342	219	686

Table 65. Statewide: Use Supplemental Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH6.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	3.9%	3.3%	4.4%	3.7%
No	96.1%	96.7%	95.6%	96.3%
Respondents (n)	330	1,369	834	2,533

Table 66. Statewide: Use Supplemental Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH6.

	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Yes	4.7%	3.7%	3.7%
No	95.3%	96.3%	96.3%
Respondents (n)	588	1,945	2,533

Table 67. Statewide: Clothes Washer ENERGY STAR by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question is ENERGYSTAR and appliancecategory_c.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	44.4%	37.0%	40.6%	41.0%
No	35.8%	46.7%	41.3%	40.7%
Unclear	19.8%	16.3%	18.1%	18.2%
Clothes washers (n)	117	312	163	592

Table 68. Statewide: Age of Primary Clothes Washer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C6.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	19.8%	15.4%	14.2%	17.0%
2 to 4 years old	25.0%	24.1%	23.1%	24.3%
5 to 9 years old	34.2%	35.0%	36.0%	34.8%
10 to 14 years old	13.2%	15.8%	15.9%	14.7%
15 to 19 years old	4.8%	5.7%	5.1%	5.2%
20 years old or more	3.1%	4.1%	5.6%	3.9%
Respondents (n)	378	1,376	848	2,602

Table 69. Statewide: Water Temperature for Wash Cycle of Clothes Washer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C4.

Water Temperature	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Hot	8.2%	5.3%	4.5%	6.4%
Warm	52.6%	49.2%	49.1%	50.6%
Cold	39.2%	45.5%	46.4%	43.0%
Respondents (n)	387	1,409	865	2,661

Table 70. Statewide: Water Temperature for Rinse Cycle of Clothes Washer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C5.

Water Temperature	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Hot	2.2%	1.5%	0.8%	1.7%
Warm	27.3%	18.0%	19.2%	22.0%
Cold	70.5%	80.5%	80.0%	76.3%
Respondents (n)	384	1,400	858	2,642

Table 71. Statewide: Average Clothes Dryer Year of Manufacturer per Household by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one.

Source: Single-family on-site inspection question YrMfr and Appliancecategory_c.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	2005	2004	2005	2005
Clothes dryers (n)	112	335	199	646

Table 72. Statewide: Average Loads of Clothes Dried per Week by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one.

Source: Single-family on-site inspection questions LoadsPerWeek and Appliancecategory_c.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	4.4	5.3	4.7	4.8
Clothes dryers (n)	113	336	206	655

Table 73. Statewide: Primary Clothes Dryer Fuel by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C8.

Dryer Fuel	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Electricity	55.2%	66.2%	81.4%	64.2%
Natural gas from underground pipes	42.2%	30.0%	10.5%	31.8%
Propane (bottled gas)	2.6%	3.7%	8.1%	4.0%
Other, specify	0%	0.1%	0%	0%
Respondents (n)	370	1,393	841	2,604

Table 74. Statewide: Age of Clothes Dryer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C9.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	16.4%	12.7%	11.3%	14.0%
2 to 4 years old	21.9%	24.2%	19.2%	22.4%
5 to 9 years old	36.4%	32.3%	40.0%	35.2%
10 to 14 years old	16.3%	17.8%	15.0%	16.7%
15 to 19 years old	5.5%	7.5%	7.9%	6.7%
20 years old or more	3.5%	5.5%	6.7%	4.9%
Respondents (n)	365	1,358	819	2,542

Table 75. Statewide: Age of Primary Refrigerator by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions K6.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	15.4%	14.4%	12.5%	14.5%
2 to 4 years old	23.2%	22.6%	23.2%	22.9%
5 to 9 years old	34.9%	33.3%	33.6%	34.0%
10 to 14 years old	18.9%	19.2%	18.0%	18.9%
15 to 19 years old	4.5%	6.4%	6.3%	5.6%
20 years old or more	3.1%	4.1%	6.5%	4.1%
Respondents (n)	439	1,442	929	2,810

Table 76. Statewide: Refrigerator ENERGY STAR by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions isEnergyStar and appliancecategory_c.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	44.8%	51.1%	55.2%	48.3%
Unclear	41.7%	28.9%	29.6%	35.5%
Yes	13.5%	20.0%	15.2%	16.1%
Refrigerators (n)	170	417	209	796

Table 77. Statewide: Style of Home by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_SF_Style of Home.

Style	Climate zone 4	Climate zone 5	Climate zone 6	Overall statewide
Colonial	15.6%	36.9%	26.0%	25.2%
Ranch	17.2%	29.1%	30.6%	23.6%
Townhouse	25.4%	3.6%	1.9%	13.8%
Cape Cod	10.6%	12.2%	10.4%	11.2%
Other	9.8%	0.9%	3.3%	5.5%
Victorian	0.8%	6.8%	7.8%	4.1%
Split Level	4.1%	1.8%	0%	2.7%
Multifamily building	4.1%	1.8%	0%	2.7%
Manufactured/Mobile	0%	1.8%	11.7%	2.3%
Brownstone	4.1%	0%	0%	2.0%
Contemporary	1.6%	0.9%	0.7%	1.2%
Row house	2.5%	0%	0%	1.2%
Modular	1.6%	0%	0.7%	0.9%
Saltbox	0.8%	0.5%	1.3%	0.7%
Bungalow	0%	1.8%	0%	0.7%
Farm house	0%	0.5%	2.6%	0.5%
Cottage	0%	0.9%	0.6%	0.4%
Modern	0.9%	0.0%	0%	0.4%
Tudor	0.8%	0%	0%	0.4%
Log home	0%	0%	1.9%	0.3%
Gothic	0%	0.5%	0%	0.2%
A-Frame	0%	0%	0.7%	0.1%
Respondents (n)	131	343	201	675

Table 78. Style of Home by Construction Type

Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_SF_Style of Home.

Style	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Colonial	25.2%	46.6%	25.2%
Ranch	23.6%	31.2%	23.6%
Townhouse	13.8%	2.3%	13.8%
Cape Cod	11.2%	1.3%	11.2%
Other	5.5%	2.1%	5.5%
Victorian	4.1%	0%	4.1%
Split Level	2.7%	0%	2.7%
Multifamily Building	2.7%	0%	2.7%
Manufactured/Mobile	2.3%	0%	2.3%
Brownstone	2.0%	0%	2.0%
Contemporary	1.2%	0.4%	1.2%
Row House	1.2%	0%	1.2%
Modular	0.9%	3.6%	0.9%
Saltbox	0.7%	0%	0.7%
Bungalow	0.7%	0%	0.7%
Farm House	0.5%	0%	0.5%
Cottage	0.4%	0%	0.4%
Modern	0.4%	11.2%	0.4%
Tudor	0.4%	0%	0.4%
Log Home	0.3%	0.4%	0.3%
Gothic	0.2%	0%	0.2%
A-Frame	0.1%	0.9%	0.1%
Respondents (n)	496	179	675

Table 79. Statewide: Type of Garage by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_GarageType.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
None	43.8%	21.5%	35.0%	33.9%
Attached	24.8%	47.7%	26.5%	33.8%
Free standing	20.7%	21.5%	36.1%	23.3%
Below living space	10.8%	9.4%	2.3%	9.0%
Respondents (n)	130	347	221	698

Table 80. Type of Garage by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_GarageType.

Type	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
None	33.9%	10.3%	33.9%
Attached	33.8%	77.8%	33.8%
Free standing	23.3%	4.3%	23.3%
Below living space	9.0%	7.6%	9.0%
Respondents (n)	518	180	698

Table 81. Statewide: Garage Finish by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_garagefinish.

Finish	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Insulated wall	56.1%	61.8%	63.3%	59.8%
Finished uninsulated Wall	34.1%	18.7%	10.2%	23.8%
Unfinished Wall	9.7%	19.4%	26.4%	16.4%
Finished insulated wall	0%	0%	0%	0%
Respondents (n)	48	239	80	367

Table 82. Garage Finish by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_garagefinish.

Finish	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Insulated wall	59.8%	68.0%	59.8%
Finished uninsulated wall	23.7%	27.2%	23.8%
Unfinished wall	16.5%	3.7%	16.4%
Finished Insulated wall	0%	1.1%	0%
Respondents (n)	213	154	367

Table 83. Statewide: If Attached Garage, Visual Inspection of Connectivity - Boundary Wall

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_ConnectionBoundaryWall.

Inspection	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Well-sealed	43.8%	61.2%	57.7%	54.2%
Some visible penetrations	49.9%	32.5%	34.8%	39.4%
Obvious large penetrations	6.2%	6.3%	7.5%	6.4%
Respondents (n)	38	186	70	294

Table 84. Statewide: If Attached Garage, Visual Inspection of Connectivity - Boundary Wall

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_ConnectionBoundaryWall.

Inspection	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Well-sealed	54.0%	89.9%	54.2%
Some visible penetrations	39.5%	10.1%	39.4%
Obvious large penetrations	6.4%	0%	6.4%
Respondents (n)	167	127	294

Table 85. Statewide: If Attached Garage, Visual Inspection of Connectivity - Boundary Wall

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_ConnectionCeiling.

Inspection	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Well-sealed	50.1%	64.2%	66.6%	58.6%
Some visible penetrations	38.4%	21.8%	21.2%	28.7%
Obvious large penetrations	11.5%	14.0%	12.1%	12.7%
Respondents (n)	31	138	54	223

Table 86. If Attached Garage, Visual Inspection of Connectivity - Boundary Wall by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_ConnectionCeiling.

Inspection	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Well-sealed	58.5%	90.1%	58.6%
Some visible penetrations	28.7%	6.9%	28.7%
Obvious large penetrations	12.8%	3.0%	12.7%
Respondents (n)	123	100	223

Table 87. Statewide: If Attached Garage, Visual Inspection of Connectivity - Duct Work by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_ConnectionDuct.

Inspection	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Some visible penetrations	59.8%	38.2%	22.2%	48.4%
Well-sealed	40.2%	39.0%	77.8%	44.1%
Obvious large penetrations	0%	22.8%	0%	7.5%
Respondents (n)	13	44	9	66

Table 88. If Attached Garage, Visual Inspection of Connectivity - Duct Work by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_ConnectionDuct.

Inspection	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Some visible penetrations	48.7%	8.3%	48.4%
Well-sealed	43.8%	89.7%	44.1%
Obvious large penetrations	7.5%	2.1%	7.5%
Respondents (n)	32	34	66

Table 89. Statewide: Foundation Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_SF_Basement Type.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Conditioned basement	39.7%	35.0%	27.7%	36.1%
Unconditioned basement	26.4%	30.0%	32.7%	28.7%
Indirectly conditioned basement	18.2%	24.7%	16.1%	20.4%
Slab on grade	9.9%	4.5%	6.9%	7.4%
Vented crawl space	3.3%	4.0%	14.9%	5.3%
Unvented crawl space	2.5%	1.8%	1.7%	2.1%
Respondents (n)	130	347	221	698

Table 90. Foundation Type by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Envelope_SF_Basement Type.

Type	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Conditioned Basement	36.0%	49.6%	36.1%
Unconditioned Basement	28.8%	12.1%	28.7%
Indirectly Conditioned Basement	20.4%	25.7%	20.4%
Slab on Grade	7.4%	4.4%	7.4%
Vented Crawl Space	5.3%	3.9%	5.3%
Unvented Crawl Space	2.1%	4.3%	2.1%
Respondents (n)	518	180	698

Table 91. Statewide: Ceiling Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Ceiling_Type.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Vented Attic	58.5%	70.7%	69.0%	64.9%
Sealed Attic	23.2%	8.7%	8.8%	15.4%
Vaulted	12.2%	17.0%	15.1%	14.5%
Cathedral	6.1%	3.5%	7.1%	5.3%
Ceiling Type (n)	175	463	305	943

Table 92. Ceiling Type by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question *Ceiling_Type*.

Type	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Vented Attic	64.9%	61.5%	64.9%
Sealed Attic	15.4%	12.6%	15.4%
Vaulted	14.5%	17.5%	14.5%
Cathedral	5.3%	8.4%	5.3%
Ceiling Type (n)	714	229	943

Table 93. Statewide: Percent of Foundation Insulated by Age of Home

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question *Interior_or_cavity_insType*.

Type	0	10	20	30	40	50	60	70	80	90	100	Overall state- wide
Less than 2 years old	0%	0%	0%	0%	0%	0%	0%	0.1%	0.1%	0%	0.2%	0.1%
2 to 4 years old	0%	0%	0%	0.3%	7.2%	0%	7.0%	0.3%	0%	0%	3.3%	2.3%
5 to 9 years old	15.5%	7.0%	5.3%	0%	0%	0%	0%	11.4%	0%	0%	3.0%	2.9%
10 to 14 years old	0%	0%	6.0%	0%	0%	0%	0%	0%	7.0%	3.1%	2.9%	2.6%
15 to 19 years old	0%	4.7%	1.2%	4.2%	0%	0%	0%	5.1%	2.8%	9.4%	4.0%	3.4%
20 to 24 years old	0%	13.3%	4.8%	4.2%	0%	10.3%	10.4%	0%	5.6%	20.2%	1.5%	4.0%
25 to 29 years old	69.0%	9.4%	4.8%	4.2%	7.1%	19.0%	6.9%	5.1%	2.8%	0%	3.8%	5.9%
30 to 34 years old	0%	0%	0%	2.1%	3.6%	3.2%	3.5%	2.6%	0%	0%	2.5%	2.1%
35 to 39 years old	0%	3.2%	1.2%	9.5%	7.1%	4.8%	6.9%	0%	1.4%	6.3%	2.5%	3.1%
40 to 44 years old	0%	6.3%	12.5%	9.5%	7.1%	3.2%	22.3%	19.1%	12.0%	3.1%	3.2%	5.5%

Table 93 continued

Type	0	10	20	30	40	50	60	70	80	90	100	Overall state-wide
45 to 49 years old	0%	0%	7.7%	0%	0%	4.8%	0%	0%	10.5%	0%	4.3%	4.1%
50 to 54 years old	0%	14.0%	6.5%	13.7%	7.1%	17.0%	0%	5.1%	7.7%	0%	6.6%	7.9%
55 to 59 years old	0%	7.0%	20.8%	15.9%	31.9%	1.6%	15.4%	7.7%	18.2%	0%	6.6%	8.5%
60 to 64 years old	0%	10.1%	6.0%	10.6%	0%	9.9%	6.9%	7.7%	7.0%	14.0%	10.0%	9.3%
65 to 69 years old	0%	3.1%	4.8%	0%	0%	0%	0%	0%	5.6%	6.2%	3.7%	3.1%
70 to 74 years old	0%	0%	0%	4.2%	0%	0%	0%	5.1%	0%	0%	4.4%	3.0%
75 to 79 years old	0%	3.1%	6.5%	0%	7.1%	0%	6.9%	0%	7.7%	6.2%	1.1%	2.1%
80 to 84 years old	0%	0%	2.4%	0%	0%	7.1%	0%	0%	2.8%	0%	2.3%	2.4%
85 to 89 years old	0%	3.1%	0%	2.1%	7.1%	3.2%	6.9%	2.6%	0%	6.2%	3.6%	3.3%
90 to 94 years old	0%	3.1%	0%	0%	0%	3.2%	0%	0%	0%	6.2%	6.7%	4.7%
95 to 99 years old	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	.4%	0.2%
Over 100 years old	15.5%	12.6%	9.6%	19.2%	14.4%	12.7%	6.9%	28.1%	8.5%	18.8%	23.5%	19.6%
Respondents (n)	3	32	44	32	17	56	18	32	39	19	513	805

Table 94. Statewide: Grade of Foundation Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *Interior_or_cavity_insType* and *interior_or_cavity_insGrade*.

Type	Grade I	Grade II	Grade III	Sub Grade III	Overall Statewide
None	0%	0%	0%	10.9%	0.6%
Fiberglass Batts	30.2%	67.5%	84.1%	72.9%	67.4%
XPS	18.9%	11.2%	4.8%	0%	9.6%
Polyisocyanurate	10.2%	4.2%	4.8%	10.8%	5.8%
Fiberglass Blanket	10.1%	6.0%	3.2%	0%	5.4%
Spray Foam	22.0%	0.7%	0%	0%	4.1%
EPS	3.5%	4.2%	1.6%	0%	2.9%
Other	3.4%	3.1%	0%	5.4%	2.2%
Foilfaced Fiberglass	0%	3.1%	1.6%	0%	1.9%
Fiberglass - Combo	1.7%	0%	0%	0%	0.3%
Fiberglass Fill	0.1%	0%	0%	0%	0%
Rock Wool	0%	0%	0%	0%	0%
Cellulose	0%	0%	0%	0%	0%
Insulation Type (n)	127	108	75	10	320

Table 95. Existing Construction: Grade of Foundation Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *Interior_or_cavity_insType* and *interior_or_cavity_insGrade*.

Type	Grade I	Grade II	Grade III	Sub Grade III	Overall Statewide
None	0%	0%	0%	10.9%	0.6%
Fiberglass Batts	29.8%	67.5%	84.1%	72.9%	67.4%
XPS	18.8%	11.2%	4.8%	0%	9.6%
Polyisocyanurate	10.3%	4.2%	4.8%	10.8%	5.8%
Fiberglass Blanket	10.2%	5.9%	3.2%	0%	5.3%
Spray Foam	22.3%	0.7%	0%	0%	4.1%
EPS	3.4%	4.2%	1.6%	0%	2.9%
Other	3.4%	3.1%	0%	5.4%	2.2%
Foiled Faced Fiberglass	0%	3.1%	1.6%	0%	1.9%
Fiberglass - Combo	1.7%	0%	0%	0%	0.3%
Insulation Type (n)	37	68	53	10	168

Table 96. New Construction: Grade of Foundation Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *Interior_or_cavity_insType* and *interior_or_cavity_insGrade*.

Type	Grade I	Grade II	Grade III	Overall Statewide
Fiberglass Batts	50.6%	60.7%	96.2%	60.4%
XPS	23.7%	9.7%	0%	16.5%
Fiberglass Blanket	4.1%	18.1%	3.8%	7.4%
EPS	4.9%	2.3%	0%	3.5%
Polyisocyanurate	5.7%	0%	0%	3.4%
Spray Foam	3.0%	4.5%	0%	2.9%
Fiberglass Fill	3.1%	2.6%	0%	2.5%
Fiberglass - Combo	3.1%	0%	0%	1.9%
Rock Wool	0.9%	2.3%	0%	1.1%
Cellulose	0.9%	0%	0%	0.5%
Insulation Type (n)	90	40	22	152

Table 97. Statewide: Exterior Foundation Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions exterior_or_cont_insType and exterior_or_cont_insGrade.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
None	97.7%	97.4%	92.4%	96.8%
Polyisocyanurate	1.5%	0.7%	2.2%	1.3%
Xps	0.8%	0.7%	2.2%	1.0%
Eps	0%	0%	2.7%	0.4%
Fiberglass batts	0%	0.7%	0%	0.3%
Other	0%	0.4%	0%	0.2%
Urethane	0%	0%	0.5%	0.1%
Cellulose	0%	0%	0%	0%
Insulation type (n)	142	409	232	783

Table 98. Exterior Foundation Insulation Type by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions exterior_or_cont_insType and exterior_or_cont_insGrade.

Type	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
None	96.8%	89.4%	96.8%
Polyisocyanurate	1.3%	0.4%	1.3%
Xps	1.0%	9.1%	1.0%
Eps	0.4%	0.7%	0.4%
Fiberglass batts	0.3%	0%	0.3%
Other	0.2%	0%	0.2%
Urethane	0.1%	0%	0.1%
Cellulose	0%	0.4%	0%
Insulation type (n)	586	197	783

Table 99. Existing Construction: Grade of Floor Insulation

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions interior_or_cavity_insGrade.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade III	48.0%	38.1%	46.1%	44.1%
Grade II	40.0%	38.1%	31.6%	37.9%
Sub Grade III	10.0%	16.7%	15.8%	13.3%
Grade I	2.0%	7.1%	6.6%	4.6%
Insulation Type (n)	50	84	76	210

Table 100. New Construction: Grade of Floor Insulation

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions interior_or_cavity_insGrade.

Grade	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade III	62.5%	49.1%	34.5%	51.1%
Grade II	37.5%	34.0%	44.8%	37.5%
Grade I	0%	15.1%	20.7%	10.6%
Sub Grade III	0%	1.9%	0%	0.8%
Insulation Type (n)	8	53	29	90

Table 101. Statewide: Grade of Continuous Floor Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *questionsexterior_or_cont_insType* and *ContinuousGrade*.

Type	Interior Cavity Grade			
	Grade I	Grade II	Grade III	Sub Grade III
None	100%	95.3%	92.0%	92.5%
XPS	0%	3.0%	1.5%	0%
Belly Wrap	0%	1.2%	3.4%	0%
Fiberglass Batts	0%	0%	0%	7.5%
Other	0%	0%	2.2%	0%
Polyisocyanurate	0%	0%	1.0%	0%
Foam	0%	0.6%	0%	0%
Insulation Type (n)	25	107	132	29

Table 102. Existing Construction: Grade of Continuous Floor Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *questionsexterior_or_cont_insType* and *ContinuousGrade*.

Type	Interior Cavity Grade			
	Grade I	Grade II	Grade III	Sub Grade III
None	100%	95.3%	92.0%	92.5%
XPS	0%	3.0%	1.5%	0%
Belly Wrap	0%	1.2%	3.4%	0%
Other	0%	0%	2.2%	0%
Fiberglass Batts	0%	0%	0%	7.5%
Polyisocyanurate	0%	0%	1.0%	0%
Foam	0%	0.6%	0%	0%
Insulation Type (n)	11	73	91	28

Table 103. New Construction: Grade of Continuous Floor Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *exterior_or_cont_insType* and *ContinuousGrade*.

Type	Interior Cavity Grade			
	Grade I	Grade II	Grade III	Sub Grade III
None	92.4%	98.1%	98.4%	100%
XPS	7.6%	0%	1.6%	0%
Polyisocyanurate	0%	1.9%	0%	0%
Insulation Type (n)	14	34	41	1

Table 104. New Construction: Grade of Floor Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *Interior_or_cavity_insType* and *interior_or_cavity_insGrade*.

Type	Grade I	Grade II	Grade III	Sub Grade III	Overall Statewide
Fiberglass Batts	44.4%	76.4%	95.3%	100%	82.8%
Spray Foam	33.9%	18.0%	3.1%	0%	12.0%
Polyisocyanurate	7.6%	3.7%	1.6%	0%	3.0%
Other	7.6%	1.9%	0%	0%	1.5%
Fiberglass Fill	6.6%	0%	0%	0%	0.7%
Insulation Type (n)	14	34	41	1	90

Table 105. Statewide: Floor Insulation Thickness by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question exterior_or_cont_insThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0	0%	14.3%	7.1%	8.1%
0.5	0%	14.3%	64.2%	29.8%
1.0	50.0%	42.9%	7.1%	31.0%
1.5	0%	0%	0.1%	0%
2.0	0%	28.5%	7.1%	13.5%
4.5	0%	0%	7.1%	2.7%
5.5	50.0%	0%	7.1%	14.8%
7.0	0%	0%	0.1%	0%
Insulation Type (n)	2	9	16	27

Table 106. Existing Construction: Floor Insulation Thickness by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question exterior_or_cont_insThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0	0%	14.3%	7.1%	8.1%
0.5	0%	14.3%	64.3%	29.9%
1.0	50.0%	42.9%	7.1%	31.0%
2.0	0%	28.6%	7.1%	13.5%
4.5	0%	0%	7.1%	2.7%
5.5	50.0%	0%	7.1%	14.8%
Insulation Type (n)	2	7	14	23

Table 107. New Construction: Floor Insulation Thickness by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question exterior_or_cont_insThickness.

Inches	Climate Zone 5	Climate Zone 6	Overall Statewide
1.0	100%	0%	53.4%
1.5	0%	50.0%	23.3%
7.0	0%	50.0%	23.3%
Insulation Type (n)	2	2	4

Table 108. Existing Construction: Wall Insulation Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Interior_or_cavity_insType.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Fiberglass Batts	61.9%	65.7%	63.3%	63.6%
None	28.8%	13.4%	15.5%	20.5%
Cellulose	2.2%	14.1%	12.8%	8.6%
Other	1.4%	1.8%	01.8%	1.6%
Fiberglass Fill	2.2%	0.07%	0.09%	1.4%
Rock Wool	2.3%	0.04%	0.09%	0.12%
Spray Foam	0.07%	0.07%	0.13%	0.08%
Polyisocyanurate	0%	0.14%	0.09%	0.07%
XPS	0%	0.11%	0.09%	0.06%
Vermiculite	.07%	0%	0.09%	0.05%
Foilfaced Fiberglass	0%	0.04%	0%	0.01%
EPS	0%	0.04%	0%	0.01%
Fiberglass - Combo	0%	0%	0.04%	0.01%
Air	0%	0%	0.04%	0.01%
Insulation Type (n)	139	277	226	642

Table 109. Statewide: Wall Insulation Thickness by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0.5	0%	1.2%	2.1%	0.9%
1.0	0%	1.7%	0.5%	0.8%
1.5	3.0%	3.3%	2.1%	3.0%
2.0	7.1%	4.5%	2.1%	5.1%
2.5	3.0%	0.8%	4.7%	2.4%
3.0	0%	5.0%	4.7%	3.0%
3.5	65.6%	38.4%	38.8%	49.2%
4.0	3.0%	11.5%	12.9%	8.4%
4.5	2.0%	0%	0.5%	0.9%
5.0	0%	2.9%	2.1%	1.6%
5.5	15.2%	28.2%	27.0%	22.9%
6.0	0%	1.7%	1.0%	0.9%
6.5	0%	0.4%	1.0%	0.4%
7.0	0%	0%	0.5%	0.1%
7.5	1.0%	0%	0%	0.4%
9.0	0%	0%	0%	0%
10.0	0%	0.4%	0%	0.2%
12.0	0%	0%	0%	0%
Insulation Type (n)	110	382	246	738

Table 110. Existing Construction: Wall Insulation Thickness

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0.5	0%	1.2%	2.1%	0.9%
1.0	0%	1.7%	0.5%	0.8%
1.5	3.0%	3.3%	2.1%	3.0%
2.0	7.1%	4.5%	2.1%	5.1%
2.5	3.0%	0.8%	4.7%	2.4%
3.0	0%	5.0%	4.7%	2.9%
3.5	65.7%	38.4%	38.9%	49.3%
4.0	3.0%	11.6%	13.0%	8.4%
4.5	2.0%	0%	0.5%	0.9%
5.0	0%	2.9%	2.1%	1.6%
5.5	15.2%	28.1%	26.9%	22.8%
6.0	0%	1.7%	1.0%	0.9%
6.5	0%	0.4%	1.0%	0.4%
7.0	0%	0%	0.5%	0.1%
7.5	1.0%	0%	0%	0.4%
10.0	0%	0.4%	0%	0.2%
Insulation Type (n)	99	242	193	534

Table 111. New Construction: Wall Insulation Thickness by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
1.0	0%	0.7%	0%	0.4%
2.0	0%	1.4%	0%	0.8%
2.5	0%	0.7%	1.9%	0.7%
3.0	9.1%	2.1%	7.5%	4.9%
3.5	9.1%	25.0%	15.1%	19.1%
4.0	0%	2.1%	0%	1.2%
4.5	0%	0.7%	3.8%	1.1%
5.0	9.1%	0.7%	1.9%	3.1%
5.5	72.7%	63.6%	64.2%	66.0%
6.0	0%	2.1%	3.8%	1.9%
9.0	0%	0%	1.9%	0.3%
12.0	0%	0.7%	0%	0.4%
Insulation Type (n)	11	140	53	204

Table 112. Statewide: Wall Insulation Framing and Grade

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question construction_detail and Interior_or_cavity_insGrade.

Frame	Grade I	Grade II	Grade III	Sub Grade III	Overall Statewide
Wood frame	86.2%	89.9%	86.2%	100%	88.4%
Brick	4.6%	6.2%	9.1%	0%	7.2%
Block	0%	0.2%	2.1%	0%	1.1%
Metal	0%	0.9%	0.4%	0%	0.6%
Concrete with rock wool	0%	0.9%	0%	0%	0.4%
Brick with some rock wool spots	0%	0%	0.8%	0%	0.4%
Brick with framing	0%	0.9%	0%	0%	0.4%
Mostly vinyl some brick	0%	0.4%	0%	0%	0.2%
Continuous exterior	0%	0.4%	0%	0%	0.2%
Common walls shared with adjacent units	0%	0%	0.4%	0%	0.2%
Two layers planking with 3/4 rigid insulation	4.6%	0%	0%	0%	0.2%
Insulated Concrete Forms	2.3%	0%	0%	0%	0.1%
Wood Frame with 1" foam board	0%	0.2%	0%	0%	0.1%
Mobile home construction	0%	0%	0.2%	0%	0.1%
Garage door and garage area	0%	0%	0.2%	0%	0.1%
Continuous sheathing insulated	0%	0%	0.2%	0%	0.1%
Brick with 2x6 interior wood framing	0%	0%	0.2%	0%	0.1%
Adiabatic Wall	0%	0%	0.2%	0%	0.1%
2x4 stud frame w brick in cavity	2.3%	0%	0%	0%	0.1%
2x4 double wall	0%	0%	0.2%	0%	0.1%
Poured concrete	0%	0%	0%	0%	0%
Structural insulated panel	0%	0%	0%	0%	0%
Insulation type (n)	79	345	285	25	734

Table 113. Statewide: Ceiling Insulation Thickness by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0	0.7%	0.3%	0%	0.5%
0.5	0%	0%	0.4%	0.1%
1.0	0%	0.7%	0%	0.3%
1.5	3.7%	0.7%	0%	1.9%
2.0	4.4%	4.1%	2.7%	4.0%
2.5	5.2%	0%	1.8%	2.5%
3.0	5.2%	5.1%	3.1%	4.8%
3.5	5.9%	5.5%	5.3%	5.6%
4.0	2.2%	3.4%	3.5%	2.9%
4.5	3.0%	1.7%	0.4%	2.0%
5.0	4.4%	5.1%	4.0%	4.7%
5.5	32.6%	19.1%	22.6%	25.4%
6.0	3.7%	7.9%	7.5%	6.0%
6.5	1.5%	1.4%	2.2%	1.6%
7.0	2.2%	1.4%	2.7%	1.9%
7.5	5.9%	9.2%	5.8%	7.3%
8.0	1.5%	4.1%	6.2%	3.3%
8.5	2.2%	2.0%	1.8%	2.1%
9.0	2.2%	2.1%	1.8%	2.1%
9.5	7.4%	4.1%	1.3%	5.1%
10.0	1.5%	4.8%	4.9%	3.4%
10.5	0.7%	1.0%	1.3%	1.0%
11.0	2.2%	2.1%	4.9%	2.6%
12.0	0.7%	7.9%	7.6%	4.8%
13.0	0%	0.7%	0.9%	0.4%
14.0	0%	1.7%	0.5%	0.8%
15.0	0%	1.4%	1.8%	0.9%
16.0	0%	1.0%	1.8%	0.7%
17.0	0%	0%	0%	0%
18.0	0.7%	0%	2.2%	0.7%
19.0	0%	0.3%	0.4%	0.2%
20.0	0%	0.7%	0%	0.3%
22.0	0%	0%	0%	0%
24.0	0%	0.3%	0.4%	0.2%
Insulation thickness (n)	146	443	290	879

Table 114. Existing Construction: Ceiling Insulation Thickness

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0	0.7%	0.3%	0%	0.5%
0.5	0%	0%	0.4%	0.1%
1.0	0%	0.7%	0%	0.3%
1.5	3.7%	0.7%	0%	1.9%
2.0	4.4%	4.1%	2.7%	4.0%
2.5	5.2%	0%	1.8%	2.5%
3.0	5.2%	5.1%	3.1%	4.8%
3.5	5.9%	5.5%	5.3%	5.6%
4.0	2.2%	3.4%	3.6%	2.9%
4.5	3.0%	1.7%	0.4%	2.0%
5.0	4.4%	5.1%	4.0%	4.7%
5.5	32.6%	19.2%	22.7%	25.5%
6.0	3.7%	7.9%	7.6%	6.0%
6.5	1.5%	1.4%	2.2%	1.6%
7.0	2.2%	1.4%	2.7%	1.9%
7.5	5.9%	9.2%	5.8%	7.3%
8.0	1.5%	4.1%	6.2%	3.3%
8.5	2.2%	2.1%	1.8%	2.1%
9.0	2.2%	2.1%	1.8%	2.1%
9.5	7.4%	4.1%	1.3%	5.1%
10.0	1.5%	4.8%	4.9%	3.4%
10.5	0.7%	1.0%	1.3%	1.0%
11.0	2.2%	2.1%	4.9%	2.6%
12.0	0.7%	7.9%	7.6%	4.8%
13.0	0%	0.7%	0.9%	0.4%
14.0	0%	1.7%	0.4%	0.8%
15.0	0%	1.4%	1.8%	0.9%
16.0	0%	1.0%	1.8%	0.7%
18.0	.7%	0%	2.2%	0.7%
19.0	0%	0.3%	0.4%	0.2%
20.0	0%	0.7%	0%	0.3%
24.0	0%	0.3%	0.4%	0.2%
Insulation thickness (n)	135	292	225	652

Table 115. New Construction: Ceiling Insulation Thickness

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityThickness.

Inches	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
1.5	0%	0%	1.5%	0.3%
2.5	0%	0%	1.5%	0.3%
4.0	9.1%	2.0%	0%	3.2%
4.5	0%	0%	1.5%	0.3%
5.0	0%	0%	1.5%	0.3%
5.5	18.2%	0.7%	3.1%	5.3%
6.0	0%	0.7%	3.1%	1.0%
6.5	0%	0.7%	0%	0.4%
7.0	0%	0.7%	0%	0.4%
7.5	0%	7.3%	1.5%	4.4%
8.0	9.1%	2.6%	1.5%	3.9%
9.0	9.1%	7.9%	3.1%	7.2%
9.5	18.2%	8.6%	1.5%	9.4%
10.0	9.1%	7.3%	7.7%	7.8%
10.5	0%	2.6%	4.6%	2.4%
11.0	9.1%	11.9%	12.3%	11.3%
12.0	9.1%	22.5%	15.4%	17.9%
13.0	0%	6.0%	3.1%	4.0%
14.0	0%	7.9%	9.2%	6.3%
15.0	0%	3.3%	1.5%	2.2%
16.0	0%	6.0%	7.7%	4.9%
17.0	0%	0%	1.5%	0.3%
18.0	9.1%	0.7%	9.2%	4.4%
20.0	0%	0.7%	4.6%	1.3%
22.0	0%	0%	3.1%	0.6%
Insulation thickness (n)	11	151	65	227

Table 116. Statewide: Ceiling Insulation Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question *Interior_or_cavity_insType*.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Fiberglass Batts	66.2%	66.2%	58.2%	65.0%
Cellulose	3.1%	20.2%	21.1%	12.6%
None	15.6%	5.8%	4.6%	10.1%
Fiberglass Fill	6.9%	3.3%	3.8%	5.0%
Rock Wool	3.7%	0.3%	1.3%	2.0%
Fiberglass - Combo	2.5%	0.6%	3.4%	1.9%
Spray Foam	0%	1.3%	2.6%	0.9%
Vermiculite	0.6%	0.6%	1.7%	0.8%
Vermiculite - Combo	0.6%	0.6%	0%	0.5%
Other	0.6%	0.3%	0.4%	0.5%
XPS	0%	0.3%	1.7%	0.4%
Polyisocyanurate	0%	0.3%	0.8%	0.3%
Structural Insulated Panel	0%	0%	0.4%	0.1%
Air	0%	0%	0%	0%
Insulation type (n)	171	462	303	936

Table 117. Existing Construction: Ceiling Insulation Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question interior_or_cavity_instype.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Fiberglass batts	66.3%	66.2%	58.2%	65.0%
Cellulose	3.1%	20.3%	21.1%	12.6%
None	15.6%	5.8%	4.6%	10.1%
Fiberglass fill	6.9%	3.2%	3.8%	5.0%
Rock wool	3.8%	0.3%	1.3%	2.0%
Fiberglass - combo	2.5%	0.6%	3.4%	1.9%
Spray foam	0%	1.3%	2.5%	0.9%
Vermiculite	0.6%	0.6%	1.7%	0.8%
Vermiculite - combo	0.6%	0.6%	0%	0.5%
Other	0.6%	0.3%	0.4%	0.5%
Xps	0%	0.3%	1.7%	0.4%
Polyisocyanurate	0%	0.3%	0.8%	0.3%
Structural insulated panel	0%	0%	0.4%	0.1%
Insulation type (n)	160	311	237	708

Table 118. New Construction: Ceiling Insulation Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question Interior_or_cavity_insType.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Fiberglass batts	54.5%	51.7%	30.3%	47.8%
Fiberglass fill	0%	28.5%	21.2%	20.3%
Spray foam	36.4%	4.6%	19.7%	15.3%
Cellulose	0%	10.6%	22.7%	10.7%
Fiberglass - combo	9.1%	1.3%	0%	2.9%
Structural insulated panel	0%	2.6%	0%	1.5%
Air	0%	0.7%	0%	0.4%
Xps	0%	0%	1.5%	0.3%
Polyisocyanurate	0%	0%	1.5%	0.3%
Other	0%	0%	1.5%	0.3%
None	0%	0%	1.5%	0.3%
Insulation type (n)	11	151	66	228

Table 119. Statewide: Duct System Type Served by Climate Zone

Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question ADT_SysServ.

System	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Heating/cooling	88.9%	83.6%	31.8%	75.6%
No distribution system present	0%	4.1%	36.4%	8.9%
Cooling	11.1%	6.6%	9.1%	8.1%
Heating	0%	5.7%	22.7%	7.4%
Respondents (n)	9	122	44	175

Table 120. Statewide: Grade of Continuous Floor Insulation by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question interior_or_cavity_insGrade.

Grade	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade II	50.0%	28.6%	49.9%	41.9%
Grade I	0%	42.9%	21.5%	24.4%
Sub Grade III	50.0%	14.3%	7.1%	20.2%
Grade III	0%	14.3%	21.5%	13.6%
Insulation Type (n)	2	9	16	27

Table 121. Existing Construction: Grade of Continuous Floor Insulation

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question interior_or_cavity_insGrade.

Grade	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade II	50.0%	28.6%	50.0%	41.9%
Grade I	0%	42.9%	21.4%	24.4%
Sub Grade III	50.0%	14.3%	7.1%	20.2%
Grade III	0%	14.3%	21.4%	13.6%
Insulation Type (n)	2	7	14	23

Table 122. New Construction: Grade of Continuous Floor Insulation

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question interior_or_cavity_insGrade.

Grade	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade I	50.0%	50.0%	50.0%
Grade II	50.0%	0%	26.7%
Grade III	0%	50.0%	23.3%
Insulation Type (n)	2	2	4

Table 123. Statewide: Wall Insulation Quality by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade III	57.5%	42.7%	37.1%	47.6%
Grade II	38.4%	47.3%	49.2%	44.1%
Sub Grade III	4.0%	4.1%	5.7%	4.4%
Grade I	0%	5.9%	7.9%	3.9%
Insulation Type (n)	109	381	244	734

Table 124. Existing Construction: Wall Insulation Quality

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade III	57.6%	42.7%	37.2%	47.7%
Grade II	38.4%	47.3%	49.2%	44.1%
Sub Grade III	4.0%	4.1%	5.8%	4.4%
Grade I	0%	5.8%	7.9%	3.9%
Insulation Type (n)	99	241	191	531

Table 125. New Construction: Wall Insulation Quality

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade II	50.0%	47.9%	50.9%	49.0%
Grade I	30.0%	22.1%	30.2%	25.5%
Grade III	20.0%	30.0%	18.9%	25.5%
Insulation type (n)	10	140	53	203

Table 126. New Construction: Grade of Floor Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *Interior_or_cavity_insType* and *interior_or_cavity_insGrade*.

Type	Grade I	Grade II	Grade III	Sub Grade III	Overall Statewide
None	0%	0%	1.0%	0%	0.4%
Fiberglass batts	53.4%	85.4%	89.4%	86.4%	85.8%
Fiberglass fill	9.4%	7.9%	1.0%	10.4%	5.2%
Cellulose	18.6%	3.6%	0.5%	0%	2.5%
Spray foam	18.7%	2.5%	1.0%	0%	2.2%
Other	0%	.6%	3.1%	0%	1.6%
Air	0%	0%	2.7%	0%	1.2%
Xps	0%	0%	1.5%	0%	0.6%
Foiled fiberglass	0%	0%	0%	3.2%	0.4%
Insulation type (n)	12	76	91	31	210

Table 127. Statewide: RimBand Insulation Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions *InteriorCavityType*.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
None	71.2%	40.8%	41.6%	54.8%
Fiberglass batts	25.0%	51.0%	43.3%	38.0%
Spray foam	1.6%	7.0%	10.0%	4.9%
Cellulose	0.8%	0.8%	0.6%	0.7%
Fiberglass fill	0.8%	0.4%	1.1%	0.7%
Polyisocyanurate	0.8%	0%	2.2%	0.7%
Xps	0%	0%	0.6%	0.1%
Air	0%	0%	0.6%	0.1%
Rock wool	0%	0%	0%	0%
Insulation type (n)	141	386	224	751

Table 128. Existing Construction: RimBand Insulation Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityType.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
None	71.2%	40.9%	41.7%	54.9%
Fiberglass batts	25.0%	51.0%	43.3%	38.0%
Spray foam	1.5%	6.9%	10.0%	4.9%
Cellulose	0.8%	0.8%	0.6%	0.7%
Polyisocyanurate	0.8%	0%	2.2%	0.7%
Fiberglass fill	0.8%	0.4%	1.1%	0.7%
Xps	0%	0%	0.6%	0.1%
Air	0%	0%	0.6%	0.1%
Insulation type (n)	132	259	180	571

Table 129. New Construction: RimBand Insulation Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityType.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Fiberglass batts	11.1%	80.3%	45.5%	57.5%
Spray foam	66.7%	17.3%	29.5%	31.3%
None	11.1%	1.6%	9.1%	5.2%
Fiberglass fill	11.1%	0%	0%	2.7%
Polyisocyanurate	0%	0.8%	6.8%	1.7%
Xps	0%	0%	4.5%	0.8%
Rock wool	0%	0%	2.3%	0.4%
Cellulose	0%	0%	2.3%	0.4%
Insulation type (n)	9	127	44	180

Table 130. Statewide: RimBand Insulation Quality by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade III	43.2%	39.8%	39.9%	40.8%
Grade II	43.2%	32.0%	34.3%	35.7%
Sub grade III	8.1%	15.0%	11.4%	12.3%
Grade I	5.6%	13.2%	14.4%	11.2%
Insulation type (n)	45	278	145	468

Table 131. Existing Construction: RimBand Insulation Quality by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade III	43.2%	39.9%	40.0%	40.9%
Grade II	43.2%	32.0%	34.3%	35.7%
Sub Grade III	8.1%	15.0%	11.4%	12.4%
Grade I	5.4%	13.1%	14.3%	11.1%
Insulation type (n)	37	153	105	295

Table 132. New Construction: RimBand Insulation Quality by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade I	62.5%	32.8%	37.5%	40.3%
Grade II	25.0%	35.2%	47.5%	35.0%
Grade III	12.5%	32.0%	15.0%	24.7%
Insulation Type (n)	8	125	40	173

Table 133. Statewide: Ceiling Insulation Quality by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade II	36.0%	44.7%	46.9%	41.3%
Grade III	47.5%	34.2%	30.7%	39.4%
Sub Grade III	13.7%	10.5%	8.3%	11.5%
Grade I	2.9%	10.6%	14.1%	7.8%
Insulation Type (n)	150	447	293	890

Table 134. Existing Construction: Ceiling Insulation Quality by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade II	36.0%	44.7%	46.9%	41.3%
Grade III	47.5%	34.2%	30.7%	39.4%
Sub Grade III	13.7%	10.5%	8.3%	11.5%
Grade I	2.9%	10.5%	14.0%	7.8%
Insulation Type (n)	139	295	228	662

Table 135. New Construction: Ceiling Insulation Quality by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions InteriorCavityGrade.

Quality	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Grade I	27.3%	39.5%	43.1%	37.4%
Grade II	27.3%	36.2%	43.1%	35.5%
Grade III	45.5%	24.3%	13.8%	27.1%
Insulation type (n)	11	152	65	228

Table 136. Statewide: Presence of Bay Windows by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions baywindow.

Bay Window	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	91.5%	94.5%	93.8%	93.1%
Yes	8.5%	5.5%	6.2%	6.9%
Respondents (n)	656	1858	1132	3646

Table 137. Existing Construction Presence of Bay Windows by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions baywindow.

Bay Window	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	91.5%	94.5%	93.8%	93.0%
Yes	8.5%	5.5%	6.2%	7.0%
Respondents (n)	602	1177	920	2699

Table 138. New Construction: Presence of Bay Windows

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions baywindow.

Bay Window	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	94.4%	97.9%	98.1%	97.0%
Yes	5.6%	2.1%	1.9%	3.0%
Respondents (n)	54	681	212	947

Table 139. Statewide: Presence of Window Glazing by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Glazing	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Double	60.1%	40.2%	43.3%	49.6%
Double low-e	20.6%	29.7%	32.8%	26.1%
Single w/ storm windows	8.4%	18.4%	12.3%	13.0%
Single	10.1%	9.5%	10.2%	9.9%
Glass block	0.5%	1.0%	0.4%	0.7%
Triple low-e	0%	0.5%	1.0%	0.3%
Triple	0.2%	0.7%	0%	0.3%
Windows (n)	658	1898	1131	3687

Table 140. Existing Construction: Presence of Window Glazing by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Glazing	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Double	60.2%	40.3%	43.4%	49.6%
Double Low-e	20.6%	29.6%	32.7%	26.0%
Single w/ Storm Windows	8.5%	18.5%	12.3%	13.1%
Single	10.1%	9.6%	10.2%	9.9%
Glass Block	0.5%	1.0%	0.4%	0.7%
Triple Low-e	0%	0.5%	1.0%	0.3%
Triple	0.2%	0.7%	0%	0.3%
Windows (n)	603	1214	920	2737

Table 141. New Construction: Presence of Window Glazing by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Glazing	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Double Low-e	83.6%	80.0%	88.6%	82.3%
Double	16.4%	18.9%	7.1%	16.4%
Triple Low-e	0%	0.1%	3.8%	0.7%
Glass Block	0%	0.9%	0%	0.5%
Single	0%	0.1%	0%	0.1%
Triple	0%	0%	0.5%	0.1%
Windows (n)	55	684	211	950

Table 142. Statewide: Window Condition by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Condition	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Good	65.4%	63.7%	65.6%	64.7%
Fair	24.2%	24.9%	25.2%	24.6%
Poor	9.9%	11.4%	9.2%	10.4%
None	0.5%	0%	0%	0.2%
Windows (n)	658	1899	1131	3688

Table 143. Existing Construction: Window Condition by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Condition	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Good	65.3%	63.6%	65.5%	64.7%
Fair	24.2%	25.0%	25.2%	24.7%
Poor	10.0%	11.4%	9.2%	10.4%
None	0.5%	0%	0%	0.2%
Windows (n)	603	1214	920	2737

Table 144. New Construction: Window Condition by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Condition	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Good	100%	99.4%	100%	99.7%
Fair	0%	0.6%	0%	0.3%
Windows (n)	55	685	211	951

Table 145. Statewide: Type of Window Frame by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_WindowFrame.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Vinyl	47.5%	42.2%	47.7%	45.4%
Wood	36.7%	50.1%	45.6%	43.4%
Metal	13.8%	6.0%	4.9%	9.3%
Fiberglass	2.0%	0.3%	0.8%	1.1%
Metal w/ Thermal Break	0%	0.4%	0.8%	0.3%
Other	0%	0.2%	0.2%	0.1%
Concrete	0%	0.3%	0%	0.1%
Mortar	0%	0.3%	0%	0.1%
Vinyl clad wood	0%	0.3%	0%	0.1%
Windows (n)	616	1776	1069	3461

Table 146. Existing Construction: Type of Window Frame by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_WindowFrame.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Vinyl	47.5%	42.1%	47.6%	45.4%
Wood	36.7%	50.2%	45.7%	43.4%
Metal	13.8%	6.0%	4.9%	9.3%
Fiberglass	2.0%	0.3%	0.8%	1.1%
Metal w/ Thermal Break	0%	0.4%	0.8%	0.3%
Other	0%	0.2%	0.2%	0.1%
Vinyl clad wood	0%	0.3%	0%	0.1%
Mortar	0%	0.3%	0%	0.1%
Concrete	0%	0.3%	0%	0.1%
Windows (n)	564	1116	863	2543

Table 147. Presence of Storm Window by Age of Home

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Age	Exterior	Interior	None	Overall statewide
Less than 2 years old	0%	0%	0.1%	0.1%
2 to 4 years old	0%	0%	2.3%	1.9%
5 to 14 years old	0.3%	2.6%	8.4%	7.1%
15 to 24 years old	5.4%	5.5%	8.7%	8.1%
25 to 34 years old	3.2%	25.7%	10.9%	10.2%
35 to 44 years old	3.6%	24.8%	9.1%	8.7%
45 to 54 years old	8.6%	1.7%	13.0%	12.1%
55 to 64 years old	17.0%	9.3%	15.9%	15.9%
65 to 74 years old	12.7%	4.3%	7.7%	8.3%
Over 75 years old	49.2%	26.0%	23.9%	27.5%
Windows (n)	382	78	2960	3420

Table 148. Existing Construction: Presence of Storm Window by Age of Home

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Age	Exterior	Interior	None	Overall statewide
2 to 4 years old	0%	0%	2.1%	1.8%
5 to 14 years old	0.3%	2.6%	8.4%	7.1%
15 to 24 years old	5.4%	5.5%	8.7%	8.1%
25 to 34 years old	3.2%	25.7%	10.9%	10.2%
35 to 44 years old	3.6%	24.8%	9.1%	8.7%
45 to 54 years old	8.6%	1.7%	13.1%	12.2%
55 to 64 years old	17.0%	9.3%	16.0%	16.0%
65 to 74 years old	12.7%	4.3%	7.7%	8.4%
Over 75 years old	49.2%	26.1%	23.9%	27.6%
Windows (n)	379	71	2022	2472

Table 149. New Construction: Presence of Storm Window by Age of Home

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions overallwindowcondition.

Age	Exterior	Interior	None	Overall statewide
Less than 2 years old	30.4%	41.5%	36.4%	36.4%
2 to 4 years old	69.6%	58.5%	63.6%	63.6%
Windows (n)	3	7	938	948

Table 150. Statewide: Average Window Size by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Enevelope_WindowSize.

Square feet	Climate zone 4	Climate zone 5	Climate zone 6	Overall statewide
Mean	13.8	12.7	12.1	13.1
Windows (n)	658	1897	1131	3686

Table 151. Average Window Size by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Enevelope_WindowSize.

Square feet	Existing Construction - built prior to 2012	New Construction - built 2012 or later	Windows (n)
Mean	13.1	16.7	13.1
Windows (n)	2737	949	3686

Table 152. Statewide: Average Number of Windows by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_Window Count.

Window Count	Climate zone 4	Climate zone 5	Climate zone 6	Overall statewide
Mean	4.1	3.6	3.7	3.8
Windows (n)	659	1897	1131	3687

Table 153. Average Number of Windows by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_Window Count.

Window Count	Existing Construction - built prior to 2012	New Construction - built 2012 or later	Overall statewide
Mean	3.8	4.5	3.8
Windows (n)	2739	948	3687

Table 154. Statewide: Average U-factor of Windows by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_U_Factor_if available.

U-factor	Climate zone 4	Climate zone 5	Climate zone 6	Overall statewide
Mean	0.4	0.3	0.3	0.3
Windows (n)	99	839	543	1481

Table 155. Average U-factor of Windows by Construction Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_U_Factor_ if available.

U-factor	Existing Construction - built prior to 2012	New Construction - built 2012 or later	Overall statewide
Mean	0.3	0.3	0.3
Windows (n)	936	545	1481

Table 156. Statewide: Door Material by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_Door_Material.

Material	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Wood - Glazing	27.5%	24.5%	27.4%	26.3%
Steel - Glazing	14.5%	19.8%	21.3%	17.5%
Glass - Sliding	16.0%	14.8%	10.4%	14.7%
Wood	11.2%	9.6%	8.1%	10.2%
Steel - Foam Filled	8.7%	11.0%	8.7%	9.6%
Steel	5.4%	7.3%	4.8%	6.1%
Wood - Panel	4.0%	4.7%	3.6%	4.2%
Fiberglass - Glazing	4.0%	4.3%	4.0%	4.1%
Vinyl - Glazing	4.7%	1.6%	6.2%	3.7%
Other	2.9%	0.4%	2.5%	1.9%
Fiberglass	0.7%	1.6%	1.4%	1.2%
Vinyl	0.4%	0.4%	1.7%	0.6%
Doors (n)	298	814	474	1586

Table 157. Existing Construction: Door Material by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_Door_Material.

Material	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Wood - Glazing	27.5%	24.6%	27.5%	26.4%
Steel - Glazing	14.5%	19.8%	21.3%	17.5%
Glass - Sliding	15.9%	14.7%	10.4%	14.7%
Wood	11.2%	9.6%	8.1%	10.2%
Steel - Foam Filled	8.7%	11.0%	8.7%	9.6%
Steel	5.4%	7.3%	4.8%	6.1%
Wood - Panel	4.0%	4.7%	3.6%	4.2%
Fiberglass - Glazing	4.0%	4.3%	3.9%	4.1%
Vinyl - Glazing	4.7%	1.6%	6.2%	3.7%
Other	2.9%	0.4%	2.5%	1.9%
Fiberglass	0.7%	1.6%	1.4%	1.1%
Vinyl	0.4%	0.4%	1.7%	0.6%
Doors (n)	276	509	357	1142

Table 158. New Construction: Door Material by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Data not captured or N/As were dropped from analysis. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions Envelope_Door_Material.

Material	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Glass - Sliding	27.3%	22.0%	23.9%	23.6%
Steel - Foam Filled	13.6%	23.3%	18.8%	20.1%
Fiberglass - Glazing	13.6%	10.8%	17.1%	12.7%
Steel - Glazing	0%	12.8%	14.5%	10.1%
Wood - Glazing	13.6%	7.2%	5.1%	8.4%
Steel	4.5%	7.5%	9.4%	7.2%
Wood	18.2%	1.6%	2.6%	5.8%
Fiberglass	0%	8.2%	1.7%	5.0%
Vinyl - Glazing	4.5%	2.0%	2.6%	2.7%
Vinyl	0%	3.3%	1.7%	2.2%
Wood - Panel	0%	1.3%	2.6%	1.2%
Other	4.5%	0%	0%	1.1%
Doors (n)	22	305	117	444

Table 159. Statewide: HVAC Cooling Location by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_SystemLocation.

Conditioned Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Conditioned	56.3%	50.5%	75.9%	56.2%
Unconditioned	21.3%	36.2%	19.4%	27.0%
Exterior	22.4%	13.4%	4.7%	16.8%
Respondents (n)	114	299	136	549

Table 160. HVAC Cooling Location by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_SystemLocation.

Location	Existing Construction - Built Prior to 2012	New Construction - Built in 2012 or Later	Overall Statewide
Conditioned	56.3%	31.9%	56.2%
Unconditioned	27.0%	24.1%	27.0%
Exterior	16.7%	44.0%	16.8%
Respondents (n)	399	150	549

Table 161. Statewide: HVAC Cooling Location by Heating System Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_SystemLocation and HVAC_Cooling_Systemtype.

Location	Air Source Heat Pump	Central Air Conditioning	Ground Source Heat Pump	Mini Split Air Conditioner	Room Free Standing Air Conditioner	Room Sleeve Air Conditioner	Room Window Air Conditioner	Overall Statewide
Conditioned	13.0%	12.8%	17.7%	19.1%	100%	100%	98.2%	56.9%
Unconditioned	0.1%	53.8%	82.3%	48.3%	0%	0%	1.3%	26.2%
Exterior	86.9%	33.3%	0%	32.5%	0%	0%	0.5%	17.0%
Respondents (n)	9	272	22	18	8	20	196	545

Table 162. Statewide: Percentage of Conditioned Space by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_PercentofConditionedSpaceserved.

Percentage of Conditioned Space	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0	0%	1.6%	13.8%	2.4%
10	14.7%	7.9%	12.2%	11.7%
20	8.8%	13.6%	15.4%	11.6%
30	10.8%	8.9%	10.6%	10.0%
40	5.9%	3.7%	4.9%	4.9%
50	12.7%	5.8%	7.3%	9.3%
60	2.0%	2.1%	5.7%	2.5%
70	1.0%	2.6%	0.8%	1.6%
80	3.9%	1.0%	1.6%	2.5%
90	2.0%	0.5%	0.8%	1.2%
100	38.3%	52.2%	26.9%	42.3%
Respondents (n)	113	301	151	565

Table 163. Percentage of Conditioned Space by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_PercentofConditionedSpaceserved.

Percentage of Conditioned Space	Existing Construction - Built Prior to 2012	New Construction - Built in 2012 or Later	Overall Statewide
0	2.4%	0%	2.4%
10	11.7%	0.9%	11.7%
20	11.6%	1.4%	11.6%
30	10.0%	3.4%	10.0%
40	4.9%	0.9%	4.9%
50	9.3%	3.3%	9.3%
60	2.5%	3.9%	2.5%
70	1.6%	0.5%	1.6%
80	2.5%	2.9%	2.5%
90	1.2%	0%	1.2%
100	42.3%	82.9%	42.3%
Respondents (n)	415	150	565

Table 164. Statewide: Air Filter Condition by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_FurnaceAirFilterCondition.

Condition	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Fair	23.3%	22.0%	26.7%	23.1%
Good	65.6%	67.4%	64.8%	66.2%
Poor	11.1%	10.7%	8.4%	10.7%
Respondents (n)	101	249	89	439

Table 165. Air Filter Condition by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_FurnaceAirFilterCondition.

Condition	Existing Construction - Built Prior to 2012	New Construction - Built in 2012 or Later	Overall Statewide
Fair	23.1%	16.9%	23.1%
Good	66.2%	78.7%	66.2%
Poor	10.7%	4.4%	10.7%
Respondents (n)	311	128	439

Table 166. Statewide: Year Cooling System Last Serviced by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_YearSystemlastserviced.

Year Serviced	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
1980	1.0%	0%	1.2%	0.7%
1985	0%	0.7%	0%	0.2%
1987	0%	0.7%	0%	0.2%
1990	1.0%	0%	0%	0.6%
1993	0%	0%	1.2%	0.1%
1994	0%	0%	1.2%	0.1%
1995	2.0%	0.7%	0%	1.4%
1996	1.0%	0%	0%	0.6%
1997	0%	0.7%	0%	0.2%
1998	1.0%	0.7%	0%	0.8%
1999	0%	0.7%	0%	0.2%
2000	1.0%	3.5%	6.1%	2.4%
2002	2.0%	0.7%	1.2%	1.5%
2003	0%	1.4%	2.4%	0.7%
2004	1.0%	0.7%	0%	0.8%
2005	4.1%	2.1%	7.3%	3.7%
2006	5.1%	2.1%	3.6%	3.9%
2007	3.1%	1.4%	1.2%	2.3%
2008	5.1%	2.1%	7.3%	4.3%
2009	2.0%	4.2%	1.2%	2.7%
2010	3.1%	3.5%	2.4%	3.2%
2011	3.1%	10.5%	4.9%	5.9%
2012	23.5%	23.3%	13.5%	22.4%
2013	38.8%	39.5%	44.0%	39.6%
2014	2.1%	0.7%	1.2%	1.5%
Respondents (n)	109	254	109	472

Table 167. Year Cooling System Last Serviced by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_YearSystemlastserviced.

Year Serviced	Existing Construction - Built Prior to 2012	New Construction - Built in 2012 or Later	Overall Statewide
1980	0.7%	0%	0.7%
1985	0.2%	0%	0.2%
1987	0.2%	0%	0.2%
1990	0.6%	0%	0.6%
1993	0.1%	0%	0.1%
1994	0.1%	0%	0.1%
1995	1.4%	0%	1.4%
1996	0.6%	0%	0.6%
1997	0.2%	0%	0.2%
1998	0.8%	0%	0.8%
1999	0.2%	0%	0.2%
2000	2.4%	0%	2.4%
2002	1.5%	0%	1.5%
2003	0.7%	0%	0.7%
2004	0.8%	0%	0.8%
2005	3.7%	0.4%	3.7%
2006	3.9%	0%	3.9%
2007	2.3%	0%	2.3%
2008	4.3%	0%	4.3%
2009	2.7%	0.4%	2.7%
2010	3.2%	0.5%	3.2%
2011	5.9%	0%	5.9%
2012	22.4%	33.9%	22.4%
2013	39.5%	61.4%	39.6%
2014	1.5%	3.4%	1.5%
Respondents (n)	322	150	472

Table 168. Statewide: Year Cooling System Last Serviced by Year of Manufacturer

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_YearSystemlastserviced.

Year 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 or More Years Old	Overall Statewide
1980	0%	0%	0%	0%	0%	5.6%	0.7%
1985	0%	0%	0%	0%	0%	2.0%	0.2%
1987	0%	0%	0%	0%	0%	2.0%	0.2%
1990	0%	0%	0%	0%	0%	4.6%	0.6%
1993	0%	0%	0%	0%	0%	1.0%	0.1%
1994	0%	0%	0%	0%	0%	1.0%	0.1%
1995	0%	0%	0%	0%	2.4%	9.1%	1.4%
1996	0%	0%	0%	0%	5.4%	0%	0.6%
1997	0%	0%	0%	0%	2.4%	0%	0.2%
1998	0%	0%	0%	0%	7.9%	0%	0.8%
1999	0%	0%	0%	0%	2.4%	0%	0.2%
2000	0%	0%	2.1%	6.3%	2.4%	4.1%	2.4%
2002	0%	0%	0%	8.3%	0%	0%	1.5%
2003	0%	0%	0%	4.2%	0%	0%	0.7%
2004	0%	0%	0%	4.5%	0%	0%	0.8%
2005	0%	0%	5.9%	3.8%	7.9%	5.6%	3.7%
2006	0%	0%	14.9%	0%	0%	0%	3.9%
2007	0%	0%	1.4%	9.3%	0%	2.0%	2.3%
2008	0.6%	1.0%	11.3%	5.9%	0%	0%	4.3%
2009	0%	0%	6.4%	3.1%	2.4%	2.0%	2.7%
2010	1.2%	12.9%	1.9%	0%	7.9%	0%	3.2%
2011	0%	20.9%	4.5%	2.1%	12.1%	4.1%	5.9%
2012	31.0%	23.8%	14.9%	21.2%	21.2%	23.4%	22.2%
2013	61.3%	41.4%	36.6%	31.3%	23.1%	33.5%	39.7%
2014	5.9%	0%	0%	0%	2.4%	0%	1.5%
Respondents (n)	199	54	85	59	33	40	470

Table 169. Statewide: Year Cooling System Last Serviced by System Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_YearSystemlastserviced and HVAC_Cooling_SystemType.

Year Serviced	Air Source Heat Pump	Air Source Heat Pump	Central Air Conditioning	Ground Source Heat Pump	Mini Split Air Conditioner	Room Free Standing Air Conditioner	Room Sleeve Air Conditioner	Room Window Air Conditioner
1980	0%	0%	0%	0%	0%	6.6%	0.3%	0.7%
1985	0%	0%	0%	0%	0%	0%	0.6%	0.2%
1987	0%	0.6%	0%	0%	0%	0%	0%	0.2%
1990	0%	0%	0%	0%	0%	0%	1.4%	0.6%
1993	0%	0%	0%	0%	0%	0%	0.3%	0.1%
1994	0%	0%	0%	0%	0%	0%	0.3%	0.1%
1995	0%	1.3%	0%	0%	0%	0%	2.1%	1.4%
1996	0%	0%	0%	0%	0%	0%	1.4%	0.6%
1997	0%	0.6%	0%	0%	0%	0%	0%	0.2%
1998	0%	0%	0%	0%	0%	6.6%	0.6%	0.8%
1999	0%	0%	0%	0%	0%	0%	0.6%	0.2%
2000	0%	3.7%	0%	0%	0%	3.0%	1.6%	2.4%
2002	0%	0%	0%	0%	0%	6.6%	2.4%	1.5%
2003	0%	0%	0%	0%	0%	0%	1.9%	0.7%
2004	0%	0%	0%	0%	0%	0%	2.1%	0.8%
2005	0%	3.9%	0%	0%	0%	0%	5.2%	3.7%
2006	0%	3.9%	0%	0%	0%	6.6%	4.3%	3.9%
2007	0%	3.8%	0%	0%	0%	0%	1.7%	2.3%
2008	0%	3.1%	0%	10.8%	0%	6.6%	4.7%	4.3%
2009	0%	5.3%	0%	0%	0%	0%	1.3%	2.7%
2010	0%	3.1%	0%	0%	0%	9.6%	2.7%	3.2%
2011	0%	6.6%	0%	7.3%	0%	6.6%	5.5%	5.9%
2012	0.1%	23.5%	28.0%	26.5%	56.3%	13.2%	22.6%	22.5%
2013	71.0%	38.7%	71.4%	53.0%	43.7%	34.6%	36.3%	39.3%
2014	28.9%	1.9%	0.5%	2.4%	0%	0%	0%	1.5%
Respondents (n)	9	248	21	16	7	18	151	470

Table 170. Statewide: Room/Window Air Conditioner Energy Efficiency Ratio by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_SystemType and HVAC_Cooling_RatedEfficiency.

Energy Efficiency Ratio (EER)	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
11.2	0%	0%	2.2%	0.4%
11	0%	3.8%	0%	1.5%
10.8	20.0%	17.0%	17.8%	18.4%
10.7	8.0%	17.0%	6.7%	11.4%
10	16.0%	3.8%	4.4%	9.1%
9.8	16.0%	13.2%	13.3%	14.4%
9.73	0%	0%	2.2%	0.4%
9.7	32.0%	28.3%	28.9%	30.0%
9.5	0%	1.9%	2.2%	1.1%
9.2	0%	1.9%	4.4%	1.5%
9	0%	0%	4.4%	0.8%
8.6	0%	0%	2.2%	0.4%
8.5	0%	1.9%	2.2%	1.1%
8	0%	7.5%	8.9%	4.6%
7	4.0%	3.8%	0%	3.2%
6	4.0%	0%	0%	1.7%
Respondents (n)	25	55	52	132

Table 171. Statewide: Air Filter Condition by Cooling System Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_FurnaceAirFilterCondition and HVAC_Cooling_SystemType.

Condition	Air Source Heat Pump	Central Air Conditioning	Ground Source Heat Pump	Mini Split Air Conditioner	Room Free Standing Air Conditioner	Room Sleeve Air Conditioner	Room Window Air Conditioner	Air Source Heat Pump
Fair	0%	19.3%	1.3%	2.9%	73.7%	38.8%	26.4%	23.1%
Good	99.9%	76.9%	98.7%	97.1%	26.3%	44.0%	54.4%	66.2%
Poor	0.1%	3.8%	0%	0%	0%	17.3%	19.3%	10.7%
Respondents (n)	6	234	18	11	7	15	147	438

Table 172. Statewide: Air Filter Condition by Cooling System Age

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_FurnaceAirFilterCondition and YrMfrCategories.

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
Fair	14.1%	15.3%	28.4%	16.6%	31.2%	39.0%	23.1%
Good	82.9%	78.3%	60.8%	62.6%	61.8%	46.8%	66.4%
Poor	3.0%	6.4%	10.8%	20.8%	7.1%	14.2%	10.5%
Respondents (n)	170	53	84	60	35	34	436

Table 173. Statewide: Cooling System Condition by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_Observedvisualcondition.

Condition	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Well Maintained	77.0%	82.4%	83.5%	79.9%
Not Well Maintained	23.0%	17.0%	16.5%	19.9%
Non-Functional	0%	0.6%	0%	0.2%
Respondents (n)	111	287	124	522

Table 174. Cooling System Condition by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection question HVAC_Cooling_Observedvisualcondition.

Condition	Existing Construction - Built Prior to 2012	New Construction - Built in 2012 or Later	Overall Statewide
Well Maintained	79.8%	100%	79.9%
Not Well Maintained	20.0%	0%	19.9%
Non-Functional	0.2%	0%	0.2%
Respondents (n)	373	149	522

Table 175. Statewide: Cooling System Condition by System Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_Observedvisualcondition and HVAC_Cooling_SystemType.

Condition	Air Source Heat Pump	Central Air Conditioning	Ground Source Heat Pump	Mini Split Air Conditioner	Room Free Standing Air Conditioner	Room Sleeve Air Conditioner	Room Window Air Conditioner	Overall Statewide
Well Maintained	100%	83.6%	100%	100%	84.0%	56.5%	75.9%	79.8%
Not Well Maintained	0%	15.9%	0%	0%	16.0%	43.5%	24.1%	20.0%
Non-Functional	0%	0.5%	0%	0%	0%	0%	0%	0.2%
Respondents (n)	9	270	22	17	8	19	176	521

Table 176. Statewide: Cooling System Condition by System Age

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions HVAC_Cooling_Observedvisualcondition and YrMfrCategories.

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
Well Maintained	97.7%	95.4%	85.6%	69.2%	67.3%	50.9%	79.7%
Not Well Maintained	2.3%	4.6%	14.4%	29.5%	32.7%	49.1%	20.1%
Non-Functional	0%	0%	0%	1.3%	0%	0%	0.2%
Respondents (n)	204	59	95	68	44	47	517

Table 177. Statewide: Duct System Type Served by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions AD_SysServ.

System	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Heating/Cooling	39.3%	55.0%	19.5%	44.3%
Heating	13.0%	40.7%	79.5%	37.8%
Cooling	47.7%	4.3%	1.1%	17.9%
Respondents (n)	57	282	126	465

Table 178. Duct System Type Served by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions AD_SysServ.

System	Existing Construction - Built Prior to 2012	New Construction - Built 2012 or Later	Overall Statewide
Heating/Cooling	44.2%	83.0%	44.3%
Heating	37.8%	7.6%	37.8%
Cooling	17.9%	9.4%	17.9%
Respondents (n)	308	157	465

Table 179. Statewide: Percentage of Duct Distribution in Unconditioned Space by Climate Zone

Source: Single-family on-site inspection questions AD_PctDistUCS.

Percentage	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0	28.6%	33.4%	33.4%	31.9%
10	4.1%	2.4%	1.8%	2.8%
20	6.1%	5.9%	0%	5.0%
30	6.1%	2.4%	0.9%	3.3%
40	4.1%	3.6%	3.5%	3.7%
50	12.3%	7.1%	5.3%	8.5%
60	2.1%	3.6%	2.6%	2.9%
70	4.1%	7.7%	13.1%	7.5%
80	10.2%	11.3%	8.8%	10.5%
90	6.1%	2.4%	3.5%	3.8%
100	16.3%	20.2%	27.2%	20.1%
Respondents (n)	60	287	142	489
Mean	45.3	46.1	52.6	46.9
Respondents (n)	60	287	142	489

Table 180. Statewide: Percentage of Duct Distribution in Unconditioned Space Insulated by Climate Zone

Source: Single-family on-site inspection questions AD_PctDistInsUCS.

Percentage	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
0	40.9%	77.4%	76.3%	65.2%
10	2.0%	0.6%	0.9%	1.1%
20	0%	1.2%	0%	0.6%
30	2.0%	0.6%	0%	1.0%
50	2.0%	3.6%	1.8%	2.8%
60	0%	0%	0.9%	0.2%
70	2.0%	1.2%	4.4%	2.0%
80	4.1%	1.8%	0.9%	2.4%
90	10.2%	0%	0.9%	3.5%
100	36.7%	13.7%	14.1%	21.3%
Respondents (n)	60	286	142	488
Mean	52.4	18.2	20.1	29.7
Respondents (n)	60	286	142	488

Table 181. Statewide: Duct Insulation Type in Unconditioned Space by Climate Zone

Source: Single-family on-site inspection questions AD_PctDistInsUCS.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
None	32.6%	82.7%	76.5%	65.2%
Fiberglass Wrap	63.3%	13.1%	17.1%	30.3%
Bubble Wrap	0.1%	3.0%	3.6%	2.1%
Various	4.1%	0%	0%	1.3%
Mobile Home Belly	0%	0.6%	1.8%	0.6%
Fiberglass (Not Wrapped)	0%	0.6%	0%	0.3%
Spray Foam	0%	0%	0.9%	0.2%
Respondents (n)	60	288	138	486

Table 182. Statewide: Duct Type in Unconditioned Space by Climate Zone

Source: Single-family on-site inspection questions AD_TypeUCS.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Metal	52.1%	88.0%	82.7%	75.4%
Flexible	47.9%	10.8%	15.4%	23.6%
Duct Board	0%	1.2%	1.8%	0.9%
Respondents (n)	59	286	138	483

Table 183. Statewide: Clothes Washer Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions TypeOrStyle and appliancecategory_c.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Top Loading	51.8%	66.7%	59.1%	59.0%
Front Loading	36.1%	30.5%	33.8%	33.5%
Stacked Washer/Dryer	7.4%	2.3%	6.5%	5.2%
Combo Washer Dryer	4.6%	0.5%	0%	2.2%
Commercial Size	0%	0%	0.6%	0.1%
Clothes washers (n)	119	344	216	679

Table 184. Statewide: Clothes Washer Age Categories per Household by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions YrMfr and Appliancecategory_c.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	2006	2005	2005	2006
Clothes washers (n)	115	340	210	665

Table 185. Statewide: Clothes Washer Age by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-family on-site inspection questions YrMfr and Appliancecategory_c.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	26.0%	15.0%	21.6%	20.8%
2 to 4 years old	16.3%	16.6%	9.8%	15.5%
5 to 9 years old	27.9%	31.9%	32.5%	30.2%
10 to 14 years old	13.4%	23.1%	19.0%	18.2%
15 to 19 years old	7.7%	6.5%	9.8%	7.5%
20 or more years old	8.6%	6.9%	7.3%	7.7%
Clothes washers (n)	115	340	210	665

Table 186. Statewide: Average Number of Loads/Cycles per Week by Climate Zone

Source: Single-Family and Tenant survey question C3, WH11 and A13a.

Appliance Type		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Clothes washer	Mean	5.4	5.2	5.2	5.3
	Respondents (n)	391	1,409	869	2,669
Dishwasher	Mean	3.7	3.5	3.3	3.6
	Respondents (n)	351	1,164	631	2,146

Table 187. Statewide: Average Loads of Clothes Washed per Week by Climate Zone

Source: Single-Family on-site inspection questions LoadsPerWeek and Appliancecategory_c.

Average Loads	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	4.3	5.3	4.8	4.8
Clothes washers (n)	118	341	216	675

Table 188. Statewide: Clothes Dryer Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions *TypeOrStyle* and *Appliancecategory_c*.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Residential	88.2%	94.9%	91.3%	91.4%
Stacked washer/dryer	7.8%	2.8%	5.5%	5.4%
Combo washer dryer	3.9%	.5%	0%	1.9%
Commercial size	0%	1.9%	1.9%	1.1%
Ventless	0%	0%	1.2%	0.2%
Clothes dryers (n)	113	339	207	659

Table 189. Statewide: Clothes Dryer Age by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions *YrMfr* and *appliancecategory_c*.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	18.9%	12.0%	16.4%	15.7%
2 to 4 years old	15.8%	18.4%	13.6%	16.6%
5 to 9 years old	26.7%	25.6%	31.1%	26.9%
10 to 14 years old	19.8%	27.0%	20.1%	22.8%
15 to 19 years old	8.9%	9.0%	10.4%	9.2%
20 or more years old	9.9%	8.0%	8.4%	8.9%
Clothes dryers (n)	112	335	199	646

Table 190. Statewide: Refrigerator Age by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions YrMfr and appliancecategory_c.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	15.4%	10.1%	13.6%	13.1%
2 to 4 years old	16.0%	13.8%	13.4%	14.8%
5 to 9 years old	27.5%	28.0%	27.7%	27.7%
10 to 14 years old	19.2%	22.7%	20.8%	20.8%
15 to 19 years old	10.9%	11.7%	8.8%	10.9%
20 or more years old	10.9%	13.8%	15.7%	12.7%
Refrigerators (n)	170	445	273	888

Table 191. Statewide: Average Refrigerator Size per Household by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions RefrigeratorFreezer_SizeCuFt and Appliancecategory_c.

Size (cubic feet)	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	19	19	19	19
Refrigerators (n)	169	445	272	886

Table 192. Statewide: Freezer Age by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions YrMfr and appliancecategory_c.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	31.2%	8.4%	21.1%	16.6%
2 to 4 years old	31.2%	11.9%	5.2%	14.7%
5 to 9 years old	6.3%	16.7%	15.8%	14.1%
10 to 14 years old	25.0%	20.2%	27.6%	23.1%
15 to 19 years old	6.2%	15.5%	5.3%	10.9%
20 or more years old	0%	27.4%	25.0%	20.6%
Freezers (n)	17	131	99	247

Table 193. Statewide: Freezer ENERGY STAR® by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions isEnergyStar and appliancecategory_c.

ENERGY STAR®	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	22.2%	67.5%	65.4%	54.0%
Unclear	61.1%	21.2%	27.2%	33.9%
Yes	16.7%	11.3%	7.4%	12.1%
Freezers (n)	19	116	78	213

Table 194. Statewide: Dishwasher ENERGY STAR by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions isEnergyStar and appliancecategory_c.

ENERGY STAR®	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	36.8%	47.1%	37.2%	40.8%
No	31.0%	38.0%	40.6%	34.7%
Unclear	32.2%	14.9%	22.2%	24.5%
Dishwashers (n)	98	267	122	487

Table 195. Statewide: Wine Cooler Age by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions YrMfr and appliancecategory_c.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	9.3%	36.7%	50.0%	20.3%
2 to 4 years old	27.3%	36.2%	16.7%	29.0%
5 to 9 years old	36.2%	27.1%	16.8%	32.1%
10 to 14 years old	18.1%	0%	16.5%	12.8%
20 or more years old	9.1%	0%	0%	5.8%
Wine coolers (n)	14	26	12	52

Table 196. Statewide: Wine Cooler ENERGY STAR by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions YrMfr and appliancecategory_c.

ENERGY STAR®	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Unclear	72.7%	40.1%	20.1%	60.3%
No	27.2%	29.9%	59.9%	30.1%
Yes	0.1%	30.0%	20.0%	9.5%
Wine coolers (n)	14	25	11	50

Table 197. Statewide: Humidifier Age by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions YrMfr and appliancecategory_c.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	9.1%	27.3%	42.3%	23.6%
2 to 4 years old	36.3%	20.8%	21.0%	25.5%
5 to 9 years old	18.3%	20.8%	5.3%	18.2%
10 to 14 years old	9.1%	12.5%	31.4%	13.7%
15 to 19 years old	9.1%	6.2%	0%	6.4%
20 or more years old	18.2%	12.5%	0%	12.7%
Humidifiers (n)	12	79	29	120

Table 198. Statewide: Humidifier Usage by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions HumidifierDehumidifier_UsagePattern and appliancecategory_c.

Season	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Winter	91.7%	91.9%	85.0%	91.1%
Summer	8.3%	4.0%	0%	4.9%
Year Round	0%	4.1%	14.9%	4.1%
Spring	0%	0%	0%	0%
Humidifiers (n)	13	81	30	124

Table 199. Statewide: Humidifier ENERGY STAR by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions HumidifierDehumidifier_isEnergyStar and appliancecategory_c.

ENERGY STAR®	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	54.5%	51.2%	45.3%	51.9%
Unclear	45.5%	28.3%	54.6%	36.5%
Yes	0%	20.5%	0.2%	11.6%
Humidifiers (n)	12	70	21	103

Table 200. Statewide: Dehumidifier Age by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions YrMfr and appliancecategory_c.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	35.3%	16.4%	23.9%	24.4%
2 to 4 years old	24.3%	25.2%	23.8%	24.6%
5 to 9 years old	27.0%	24.3%	25.4%	25.4%
10 to 14 years old	2.7%	13.5%	12.7%	9.4%
15 to 19 years old	5.4%	9.0%	6.3%	7.3%
20 or more years old	5.4%	11.7%	7.9%	8.8%
Dehumidifiers (n)	45	169	78	292

Table 201. Statewide: Average Dehumidifier Year of Manufacturer per Household by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one.

Source: Single-Family on-site inspection questions HumidifierDehumidifier_YrMfr and Appliancecategory_c.

Year of Manufacture	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	2009	2005	2006	2007
Dehumidifiers (n)	45	169	78	292

Table 202. Statewide: Dehumidifier ENERGY STAR by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one.

Source: Single-Family on-site inspection questions *HumidifierDehumidifier_isEnergyStar* and *appliancecategory_c*.

ENERGY STAR®	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	63.1%	63.9%	50.1%	62.0%
No	28.9%	30.9%	41.2%	31.2%
Unclear	7.9%	5.2%	8.7%	6.7%
Dehumidifiers (n)	46	148	61	255

Table 203. Statewide: Pool in Ground by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions *PoolHotTub_InGround* and *appliancecategory_c*.

Location	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Above Ground	50.0%	60.6%	76.5%	57.9%
In Ground	50.0%	39.4%	23.5%	42.1%
Pools (n)	17	41	19	77

Table 204. Statewide: Hot Tub in Ground by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions *PoolHotTub_InGround* and *appliancecategory_c*.

Location	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Above Ground	100%	100%	94.5%	98.0%
In Ground	0%	0%	5.5%	2.0%
Hot tubs (n)	1	21	21	43

Table 205. Statewide: Hot Tub Heated by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions PoolHotTub_Heated and appliancecategory_c.

Heated	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	100%	100%	88.9%	96.0%
No	0%	0%	11.1%	4.0%
Hot tubs (n)	1	21	21	43

Table 206. Statewide: Hot Tub Pump High Efficiency by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions PoolHotTub_HighEfficiencyPump and appliancecategory_c.

High Efficiency	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Unclear	100%	40.0%	47.1%	42.7%
Yes	0%	33.3%	23.5%	29.7%
No	0%	26.7%	29.4%	27.6%
Hot tub pumps (n)	1	20	20	41

Table 207. Statewide: Pool Fuel by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions PoolHotTub_Fuel and appliancecategory_c.

Fuel	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
None	35.6%	60.6%	58.8%	49.6%
Electricity	64.2%	24.3%	29.4%	42.0%
Natural Gas	0.1%	12.1%	0%	5.5%
Propane	0.1%	3.0%	11.8%	2.8%
Pools (n)	17	41	19	77

Table 208. Statewide: Hot Tub Fuel by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions PoolHotTub_Fuel and appliancecategory_c

Fuel	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Electricity	100%	100%	94.1%	98.0%
Natural Gas	0%	0%	5.9%	2.0%
Hot tubs (n)	1	21	20	42

Table 209. Statewide: Pool Pump Size by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions PoolHotTub_PumpSize_HP and appliancecategory_c.

Size (horsepower)	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Unknown	21.4%	28.1%	47.0%	27.4%
1	14.2%	34.4%	23.6%	24.3%
1.5	35.6%	9.4%	11.8%	21.1%
0.5	28.5%	3.1%	5.9%	14.5%
0.75	0%	15.6%	5.9%	7.6%
2	0.1%	3.1%	0%	1.4%
20	0%	3.1%	0%	1.4%
1.25	0%	3.1%	0%	1.4%
0.25	0%	0%	5.9%	0.7%
3	0.2%	0%	0%	0.1%
Pool pumps (n)	17	40	19	76

Table 210. Average Number of TVs by type by Climate Zone*Source: Single-Family and Tenant survey question A2.*

TV Type		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Standard	Mean	0.3	0.5	0.2	0.3
	Respondents (n)	249	81	47	377
Flat screen Plasma	Mean	0.2	0.2	0.2	0.2
	Respondents (n)	249	81	47	377
Flat screen LCD/LED	Mean	0.9	0.7	1.0	0.9
	Respondents (n)	249	81	47	377
Rear projection	Mean	0.0	0	0	0
	Respondents (n)	249	81	47	377
Flat screen of unknown type	Mean	0.2	0.3	0.1	0.2
	Respondents (n)	249	80	33	362

Table 211. Statewide: Average Number of Televisions per Single-family Household by Type and Climate Zone*Source: Single-Family and Tenant survey questions A2*

Type		Climate zone 4	Climate zone 5	Climate zone 6	Overall statewide
Standard	Mean	0.3	0.5	0.2	0.3
	Respondents (n)	249	81	47	377
Flat screen Plasma	Mean	0.2	0.2	0.2	0.2
	Respondents (n)	249	81	47	377
Flat screen LCD/LED	Mean	0.9	0.7	1.0	0.9
	Respondents (n)	249	81	47	377
Rear projection	Mean	0.0	0.0	0.0	0.0
	Respondents (n)	249	81	47	377
Flat screen of unknown type	Mean	0.2	0.3	0.1	0.2
	Respondents (n)	249	80	33	362

Table 212. Statewide: Average Number of Televisions per Single-family Household by Climate Zone

Source: Single-family on-site inspection questions Units and Appliancecategory_c.

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	2.8	2.6	2.3	2.6
Respondents (n)	473	1471	835	2779

Table 213. Statewide: Average Television Size (in inches) by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions Televisions_Size and Appliancecategory_c.

Size	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	34"	33"	32"	33"
Televisions (n)	322	866	501	1,689

Table 214. Statewide: Average Television Size (in inches) by TV Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions Televisions_Size and TypeorStyle.

Size	CRT	LCD	LED	Other	Plasma	Projection	Overall Statewide
Mean	24"	34"	38"	35"	45"	62"	33"
Televisions (n)	399	592	581	7	103	7	1,689

Table 215. Statewide: Television Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions TypeorStyle and appliancecategory_c.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
LCD	38.5%	30.6%	34.1%	34.8%
LED	37.2%	33.2%	29.0%	34.5%
CRT	20.6%	29.6%	31.5%	25.6%
Plasma	2.7%	5.7%	4.6%	4.1%
Projection	0.7%	0.6%	0.3%	0.6%
Other	0.3%	0.4%	0.5%	0.4%
Televisions (n)	323	868	501	1,692

Table 216. Average Number of Office Equipment Types by Climate Zone*Source: Single-Family and Tenant survey questions A7.*

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

Table 217. Statewide: Average Number of Computers per Single-family Household by Climate Zone*Source: Single-Family and Tenant survey questions A7a, A7b, A7c*

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	2.2	1.8	1.6	1.9
Respondents (n)	510	1,498	960	2,968

Table 218. Statewide: Computer Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions *TypeorStyle* and *appliancecategory_c*.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Laptop	42.0%	46.5%	50.8%	44.8%
Desktop	34.2%	42.2%	35.6%	37.3%
Tablet	23.8%	11.3%	13.7%	17.9%
Computers (n)	244	567	339	1,150

Table 219. Statewide: Computer Monitor Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions *Computer_MonitorType* and *appliancecategory_c*.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
LCD	70.6%	60.4%	63.9%	66.0%
LED	27.1%	36.1%	32.8%	31.1%
CRT	1.9%	2.3%	2.5%	2.1%
Plasma	0.5%	1.2%	0.8%	0.8%
Computer Monitors (n)	237	544	314	1,095

Table 220. Statewide: Computer Monitor Type by Computer Type

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions *Computer_MonitorType* and *TypeorStyle*.

Type	Desktop	Laptop	Tablet	Overall Statewide
LCD	65.9%	66.7%	64.7%	66.0%
LED	28.3%	32.6%	33.4%	31.1%
CRT	5.4%	0.1%	0%	2.1%
Plasma	0.4%	0.6%	2.0%	0.8%
Computer Monitors (n)	413	502	180	1,095

Table 221. Statewide: Fan Type by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions Fans_TypeorStyle and appliancecategory_c.

Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Ceiling	57.9%	68.2%	65.0%	63.1%
Plug In	42.1%	31.8%	35.0%	36.9%
Fans (n)	145	386	246	777

Table 222. Statewide: Fan Usage by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions Fans_SeasonalOrYearRoundUse and appliancecategory_c.

Usage	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Seasonal	90.2%	77.1%	76.8%	82.9%
Year Round	9.8%	18.7%	21.1%	15.1%
Rarely/Never Used	0%	4.1%	2.1%	2.0%
Fans (n)	145	386	246	777

Table 223. Statewide: Dehumidifier usage by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions HumidifierDehumidifier_UsagePattern and appliancecategory_c.

Season	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Summer	79.5%	60.0%	61.4%	67.4%
Year Round	17.9%	35.7%	25.7%	27.7%
Spring	2.6%	2.6%	10.0%	3.7%
Winter	0%	1.7%	2.9%	1.3%
Dehumidifiers (n)	47	173	85	305

Table 224. Statewide: Average Number of Dishwasher Loads per Week by Climate Zone

The reported (n) may not equal the number of households as households may not have a measure or may have more than one. Totals may not sum to 100 percent due to rounding.

Source: Single-Family on-site inspection questions Dishwasher_UsagePattern and Appliancecategory_c.

Loads per Week	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	3.2	3.4	3.3	3.3
Dishwashers (n)	101	289	156	546

Table 225. Household Members Work Primarily from Home by Climate Zone

Source: Single-Family and Tenant survey questions A11 and A11b.

Work From Home			Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Household members primarily work from home	Yes	Column N %	16.4%	5.6%	6.6%	14.6%
	No	Column N %	83.6%	94.4%	93.4%	85.4%
	Respondents (n)	Unweighted Count	251	80	47	378
Number of people work from home	Mean		1.4	1.0	1.0	1.3
	Respondents (n)		41	5	3	49

Table 226. Household Members Work Primarily from Home by Construction Type

Source: Single-Family and Tenant survey questions A11 and A11b.

Work From Home			New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Household members primarily work from home	Yes	Column N %	2.7%	14.7%	14.6%
	No	Column N %	97.3%	85.3%	85.4%
	Respondents (n)	Unweighted Count	11	367	378
Number of people work from home	Mean		1.0	1.3	1.3
	Respondents (n)		1	48	49

Table 227. Number of Household Members by Age by Climate Zone*Source: Single-Family and Tenant survey question D2.*

Age Category		Climate zone 4	Climate zone 5	Climate zone 6	Overall statewide
How many people currently living in your home are - Less than 5 years old	Mean	0.2	0.1	0.2	0.2
	Respondents (n)	250	81	45	376
How many people currently living in your home are - 6 to 17 years old	Mean	0.2	0.1	0.2	0.2
	Respondents (n)	250	81	45	376
How many people currently living in your home are - 18 to 24 years old	Mean	0.2	0.1	0.7	0.2
	Respondents (n)	250	81	45	376
How many people currently living in your home are - 25 to 34 years old	Mean	0.5	0.5	0.3	0.5
	Respondents (n)	250	81	45	376
How many people currently living in your home are - 35 to 44 years old	Mean	0.4	0.1	0.3	0.3
	Respondents (n)	250	81	45	376
How many people currently living in your home are - 45 to 54 years old	Mean	0.3	0.1	0.2	0.2
	Respondents (n)	250	81	45	376
How many people currently living in your home are - 55 to 64 years old	Mean	0.2	0.3	0.2	0.2
	Respondents (n)	250	81	45	376
How many people currently living in your home are - 65 or older	Mean	0.2	0.3	0.2	0.2
	Respondents (n)	250	81	45	376
Number of people living in home	Mean	2.1	1.5	2.2	2.0
	Respondents (n)	250	81	45	376

Table 228. Number of Household Members by Age by Construction Type*Source: Single-Family and Tenant survey questions D2.*

Age Category		New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
How many people currently living in your home are - Less than 5 years old	Mean	0.2	0.1	0.1
	Respondents (n)	11	368	379
How many people currently living in your home are - 6 to 17 years old	Mean	0.2	0.1	0.1
	Respondents (n)	11	368	379
How many people currently living in your home are - 18 to 24 years old	Mean	0.1	0.2	0.2
	Respondents (n)	11	368	379
How many people currently living in your home are - 25 to 34 years old	Mean	0.5	0.5	0.5
	Respondents (n)	11	368	379
How many people currently living in your home are - 35 to 44 years old	Mean	0.1	0.3	0.3
	Respondents (n)	11	368	379
How many people currently living in your home are - 45 to 54 years old	Mean	0	0.2	0.2
	Respondents (n)	11	368	379
How many people currently living in your home are - 55 to 64 years old	Mean	0.1	0.1	0.1
	Respondents (n)	11	368	379
How many people currently living in your home are - 65 or older	Mean	0.8	0.1	0.1
	Respondents (n)	11	368	379
Number of people living in home	Mean	2.0	2.0	2.0
	Respondents (n)	11	365	376

Table 229. Highest Level of Education by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions D3.

Education	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than high school	0.4%	0%	0%	0.3%
Some high school	0.8%	1.5%	4.4%	1.0%
High school graduate or equivalent (e.g., GED)	5.9%	20.3%	8.8%	7.8%
Trade or technical school (e.g. Associate's degree)	2.8%	8.0%	6.6%	3.6%
Some college, no degree	9.2%	10.7%	24.6%	10.1%
College degree (e.g. Bachelor's degree)	32.8%	27.3%	24.3%	31.7%
Some graduate school	4.0%	5.4%	4.4%	4.2%
Graduate degree (e.g. Masters or Doctorate degree)	44.1%	26.8%	26.8%	41.2%
Respondents (n)	250	81	47	378

Table 230. Highest Level of Education by Construction type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions D3.

Education	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Less than high school	0%	0.3%	0.3%
Some high school	2.7%	1.0%	1.0%
High school graduate or equivalent (e.g., GED)	43.3%	7.6%	7.8%
Trade or technical school (e.g. Associate's degree)	0%	3.6%	3.6%
Some college, no degree	2.7%	10.1%	10.1%
College degree (e.g. Bachelor's degree)	48.6%	31.6%	31.7%
Some graduate school	0%	4.2%	4.2%
Graduate degree (e.g. Masters or Doctorate degree)	2.7%	41.4%	41.2%
Respondents (n)	11	367	378

Table 231. 2012 Annual Household Income by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions D4.

Household Income	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than \$25,000	17.7%	28.2%	34.0%	19.8%
\$25,000 to less than \$30,000	1.9%	13.8%	12.1%	3.9%
\$30,000 to less than \$35,000	2.8%	7.6%	7.3%	3.6%
\$35,000 to less than \$50,000	12.9%	11.9%	15.0%	12.9%
\$50,000 to less than \$75,000	16.6%	25.2%	14.6%	17.7%
\$75,000 to less than \$100,000	12.6%	9.0%	7.3%	11.9%
\$100,000 to less than \$150,000	15.4%	3.0%	4.9%	13.3%
\$150,000 to less than \$200,000	9.3%	1.5%	2.4%	8.0%
\$200,000 or more	10.7%	0%	2.4%	8.9%
Respondents (n)	215	72	42	329

Table 232. 2012 Annual Household Income by Dwelling Unit type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions D4 and B3.

Household Income	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Less than \$25,000	0%	20.0%	19.8%
\$25,000 to less than \$30,000	8.7%	3.9%	3.9%
\$30,000 to less than \$35,000	2.9%	3.6%	3.6%
\$35,000 to less than \$50,000	44.2%	12.7%	12.9%
\$50,000 to less than \$75,000	41.2%	17.5%	17.7%
\$75,000 to less than \$100,000	2.9%	11.9%	11.9%
\$100,000 to less than \$150,000	0%	13.4%	13.3%
\$150,000 to less than \$200,000	0%	8.0%	8.0%
\$200,000 or more	0%	9.0%	8.9%
Respondents (n)	8	321	329

Table 233. Number of Stories by Climate Zone*Source: Single-Family and Tenant survey questions B3c.*

	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	8.6	2.9	2.6	7.6
Respondents (n)	251	81	47	379

Table 234. Number of Stories by Construction Type*Source: Single-Family and Tenant survey questions B3c.*

Number of Stories	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Mean	2.6	7.7	7.6
Respondents (n)	11	368	379

Table 235. Retail Space in Building by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions B3d.

Retail Space in Building	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	24.8%	4.0%	4.4%	21.3%
No	75.2%	96.0%	95.6%	78.7%
Respondents (n)	251	81	47	379

Table 236. Major Renovation in Past Five Years by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions B8.

Major Renovation	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	8.0%	3.0%	3.0%	7.2%
No	92.0%	97.0%	97.0%	92.8%
Respondents (n)	227	72	35	334

Table 237. Electric Utility Provider by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions S5.

Electric Utility	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Central Hudson	0%	5.7%	0.4%	0.7%
ConEd	92.7%	0%	0%	77.0%
LIPA	7.1%	0%	0%	5.9%
National Grid	0%	50.9%	41.9%	8.2%
NYSEG	0.3%	13.4%	57.7%	4.5%
O&R	0%	4.5%	0%	0.6%
RG&E	0%	25.4%	0%	3.2%
Respondents (n)	251	81	47	379

Table 238. Natural Gas Provider by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U1a.

Natural Gas Provider	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Consolidated Edison Company Of N Y, Inc.	51.6%	0%	0%	44.1%
National Grid	36.0%	38.3%	35.8%	36.3%
Ambit New York, LLC	2.9%	3.5%	1.5%	2.9%
New York State Electric & Gas Corporation	0%	13.9%	44.8%	2.8%
Just Energy	1.9%	0%	9.0%	1.9%
Rochester Gas & Electric Corporation	0%	13.9%	0%	1.6%
Keyspan Energy Delivery (Long Island)	1.9%	0%	0%	1.6%
Other, specify	1.0%	3.8%	0%	1.3%
Orange And Rockland Utilities, Inc.	0%	7.7%	0%	0.9%
Keyspan Energy Delivery (New York)	1.0%	0%	0%	0.8%
IDT Energy, Inc.	1.0%	0%	0%	0.8%
Hiko Energy LLC	1.0%	0%	0%	0.8%
Direct Energy Services, LLC	1.0%	0%	0%	0.8%
Constellation Energy Gas Choice, Inc.	1.0%	0%	0%	0.8%
Central Hudson Gas & Electric Corporation	0%	4.5%	0%	0.5%
North American Power And Gas, LLC	0%	3.5%	0%	0.4%
New York Gas & Electric	0%	3.5%	0%	0.4%
National Fuel Resources, Inc	0%	3.5%	0%	0.4%
National Fuel Gas Distribution Corporation	0%	3.5%	0%	0.4%
Corning Natural Gas Corporation	0%	0%	9.0%	0.2%
American Power & Gas LLC	0%	0.3%	0%	0%
Respondents (n)	105	35	12	152

Table 239. Natural Gas Provider by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U1a.

Natural Gas Provider	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Consolidated Edison Company Of NY, Inc.	0%	44.5%	44.1%
National Grid	63.9%	36.0%	36.3%
Ambit New York, LLC	4.6%	2.9%	2.9%
New York State Electric & Gas Corporation	0%	2.9%	2.8%
Just Energy	0%	1.9%	1.9%
Rochester Gas & Electric Corporation	0%	1.7%	1.6%
Keyspan Energy Delivery (Long Island)	0%	1.6%	1.6%
Other, specify	4.5%	1.2%	1.3%
Orange And Rockland Utilities, Inc.	9.0%	0.8%	0.9%
Keyspan Energy Delivery (New York)	0%	0.8%	0.8%
IDT Energy, Inc.	0%	0.8%	0.8%
Hiko Energy LLC	0%	0.8%	0.8%
Direct Energy Services, LLC	0%	0.8%	0.8%
Constellation Energy Gas Choice, Inc.	0%	0.8%	0.8%
Central Hudson Gas & Electric Corporation	13.5%	0.4%	0.5%
North American Power And Gas, LLC	0%	0.4%	0.4%
New York Gas & Electric	0%	0.4%	0.4%
National Fuel Resources, Inc	0%	0.4%	0.4%
National Fuel Gas Distribution Corporation	0%	0.4%	0.4%
Corning Natural Gas Corporation	0%	0.2%	0.2%
American Power & Gas LLC	4.5%	0%	0.0%
Respondents (n)	9	143	152

Table 240. Who Pays for Natural Gas by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U1.

Natural Gas Provider	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Pay directly to natural gas company	55.4%	82.7%	69.1%	57.9%
Natural gas included in rent or condo fee	44.6%	17.3%	30.9%	42.1%
Respondents (n)	193	41	17	251

Table 241. Who Pays for Natural Gas by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U1.

Natural Gas Provider	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Pay directly to natural gas company	100%	57.7%	57.9%
Natural gas included in rent or condo fee	0%	42.3%	42.1%
Respondents (n)	9	242	251

Table 242. Natural Gas Available on Street by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U2a.

Natural Gas Available on Street	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	62.5%	45.0%	58.8%	56.3%
No	37.5%	55.0%	41.2%	43.7%
Respondents (n)	16	20	17	53

Table 243. Natural Gas Available on Street by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U2a.

Natural Gas Available on Street	Existing Construction - Built Prior to 2012	Overall Statewide
Yes	56.3%	56.3%
No	43.7%	43.7%
Respondents (n)	53	53

Table 244. Interested in Converting to Natural Gas by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U2b.

Interested in Converting to Natural Gas	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	80.0%	66.7%	80.0%	76.6%
Yes	20.0%	33.3%	20.0%	23.4%
Respondents (n)	10	9	10	29

Table 245. Interested in Converting to Natural Gas by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions U2b.

Interested in Converting to Natural Gas	Existing Construction - Built Prior to 2012	Overall Statewide
No	76.6%	76.6%
Yes	23.4%	23.4%
Respondents (n)	29	29

Table 246. Average Number of Fireplaces by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H7.

Fireplace Type		Climate zone 4	Climate zone 5	Climate zone 6	Overall statewide
Wood	Mean	0	0	0	0
	Respondents (n)	238	80	46	364
Natural gas	Mean	0.1	0	0	0
	Respondents (n)	238	80	46	364
Propane	Mean	0	0	0	0
	Respondents (n)	238	72	25	335
Electric	Mean	0	0.1	0	0
	Respondents (n)	238	80	46	364

Table 247. Average Number of Fireplaces by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H7.

Fireplace Type		New Construction - built 2012 or later	Existing Construction - built prior to 2012	Overall statewide
Wood	Mean	0	0	0
	Respondents (n)	11	353	364
Natural gas	Mean	0.1	0	0
	Respondents (n)	11	353	364
Propane	Mean	0	0	0
	Respondents (n)	10	325	335
Electric	Mean	0.1	0	0
	Respondents (n)	11	353	364

Table 248. Heating System ENERGY STAR Rated by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H5.

Heating System ENERGY STAR	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	42.5%	55.2%	42.9%	45.8%
No	57.5%	44.8%	57.1%	54.2%
Respondents (n)	18	17	7	42

Table 249. Heating System ENERGY STAR Rated by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H5.

Heating System ENERGY STAR	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Yes	100%	42.3%	45.8%
No	0%	57.7%	54.2%
Respondents (n)	6	36	42

Table 250. Average Number of Other Heating Sources by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H7.

Heating Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Heat stove	0	0	0	0
	242	79	45	366
Portable electric heater	0.2	0.1	0.2	0.2
	242	79	45	366
Portable kerosene heater	0	0	0	0
	242	79	45	366

Table 251. Average Number of Other Heating Sources by Construction Type*Source: Single-Family and Tenant survey questions H7.*

Heating Type	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Heat stove	0	0	0
	11	355	366
Portable electric heater	0.1	0.2	0.2
	11	355	366
Portable kerosene heater	0	0	0
	11	355	366

Table 252. Average Room or Window Air Conditioners by Climate Zone*Source: Single-Family and Tenant survey questions H17.*

Average Room or Window Air Conditioners	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	1.9	1.4	1.3	1.8
Respondents (n)	208	40	23	271

Table 253. Average Room or Window Air Conditioners by Construction Type*Source: Single-Family and Tenant survey questions H17.*

Average Room or Window Air Conditioners	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Mean		1.8	1.8
Respondents (n)	0	271	271

Table 254. Average Ventilation Equipment by Climate Zone*Source: Single-Family and Tenant survey questions H27.*

Ventilation Type		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Ceiling fans	Mean	0.4	0.5	0.2	0.4
	Respondents (n)	247	80	47	374
Kitchen exhaust fans	Mean	0.4	0.8	0.7	0.5
	Respondents (n)	247	80	47	374
Bathroom exhaust fans	Mean	0.3	0.8	0.8	0.4
	Respondents (n)	247	80	47	374
Attic fans	Mean	0	0	0	0
	Respondents (n)	247	80	47	374
Whole house fans	Mean	0.1	0	0	0.1
	Respondents (n)	247	80	47	374

Table 255. Average Ventilation Equipment by Construction Type*Source: Single-Family and Tenant survey questions H27.*

Ventilation Type		New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Ceiling fans	Mean	0.1	0.4	0.4
	Respondents (n)	11	363	374
Kitchen exhaust fans	Mean	0.1	0.5	0.5
	Respondents (n)	11	363	374
Bathroom exhaust fans	Mean	1.4	0.3	0.4
	Respondents (n)	11	363	374
Attic fans	Mean	0	0	0
	Respondents (n)	11	363	374
Whole house fans	Mean	0	0.1	0.1
	Respondents (n)	11	363	374

Table 256. Presence of Programmable Thermostat by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H19 and H20.

		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Have programmable thermostat	Yes	20.5%	46.2%	38.2%	24.5%
	No	79.5%	53.8%	61.8%	75.5%
	Respondents (n)	251	81	47	379
Use of programmable thermostat	Programmed to change temperature automatically	22.8%	23.5%	25.0%	23.1%
	Manually change the temperature	65.6%	60.9%	69.2%	64.7%
	Both	11.7%	15.6%	5.8%	12.2%
	Respondents (n)	52	39	19	110

Table 257. Presence of Programmable Thermostat by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H19 and H20.

		New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Have programmable thermostat	Yes	94.6%	24.1%	24.5%
	No	5.4%	75.9%	75.5%
	Respondents (n)	11	368	379
Use of programmable thermostat	Programmed to change temperature automatically	48.6%	22.5%	23.1%
	Manually change the temperature	40.1%	65.3%	64.7%
	Both	11.3%	12.2%	12.2%
	Respondents (n)	9	101	110

Table 258. Presence of Programmable Thermostat by Fuel Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions H19 and H20.

		Natural Gas	Fuel Oil	Propane	Electricity	Other	Overall Statewide
Have programmable thermostat	Yes	69.1%	0%	100%	30.7%	100%	52.3%
	No	30.9%	100%	0%	69.3%	0%	47.7%
	Respondents (n)	56	1	1	40	2	100
Use of programmable thermostat	Programmed to change temperature automatically	45.6%	0%	0%	0%	0%	30.2%
	Manually change the temperature	44.3%	0%	100%	84.4%	100%	59.0%
	Both	10.1%	0%	0%	15.6%	0%	10.8%
	Respondents (n)	39	0	1	11	2	53

Table 259. Type of Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH2.

Water Heater Type	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Stand-alone storage tank	84.2%	87.8%	80.4%	85.3%
Tankless or on demand water heater	0%	4.2%	0%	1.9%
Heat pump water heater	7.9%	0%	12.4%	5.0%
Part of the heating system boiler	7.9%	8.0%	7.2%	7.8%
Respondents (n)	13	34	17	64

Table 260. Type of Water Heating System by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH2.

Water Heater Type	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Stand-alone storage tank	71.6%	85.7%	85.3%
Tankless or on demand water heater	9.4%	1.6%	1.9%
Heat pump water heater	0%	5.2%	5.0%
Part of the heating system boiler	19.0%	7.5%	7.8%
Respondents (n)	8	56	64

Table 261. Type of Water Heating System by Heating System Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH2 and H3.

Water Heater Type	Central Forced Air Furnace with Ducts to Individual Rooms	Steam/Hot Water System with Radiators or Pipes in Each Room	Air Source Heat Pump	Baseboard Heat	Overall Statewide
Stand-alone storage tank	86.8%	76.4%	100%	91.5%	86.7%
Tankless or on demand water heater	3.2%	0%	0%	0%	2.4%
Heat pump water heater	1.6%	0%	0%	8.5%	2.3%
Part of the heating system boiler	8.5%	23.6%	0%	0%	8.7%
Respondents (n)	35	8	1	9	53

Table 262. Type of Water Heating System by Water Heater Fuel

Source: Single-Family and Tenant survey questions WH2 and WH3.

Water Heater Type	Electricity	Natural Gas from Underground Pipes	Overall Statewide
Stand-alone storage tank	94.3%	78.9%	84.6%
Tankless or on demand water heater	0.4%	2.9%	2.0%
Heat pump water heater	2.6%	6.8%	5.2%
Part of the heating system boiler	2.6%	11.5%	8.2%
Respondents (n)	27	34	61

Table 263. Age of Primary Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH4.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	14.5%	22.3%	22.4%	18.8%
2 to 4 years old	25.7%	29.1%	21.2%	26.3%
5 to 9 years old	34.2%	38.9%	42.3%	37.3%
10 to 14 years old	17.1%	9.7%	14.1%	13.7%
15 to 19 years old	8.6%	0%	0%	3.8%
Respondents (n)	12	26	15	53

Table 264. Age of Primary Water Heating System by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question WH4.

Age	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Less than 2 years old	100%	15.5%	18.8%
2 to 4 years old	0%	27.4%	26.3%
5 to 9 years old	0%	38.9%	37.3%
10 to 14 years old	0%	14.3%	13.7%
15 to 19 years old	0%	4.0%	3.8%
Respondents (n)	8	45	53

Table 265. Age of Primary Water Heating System by Water Heater Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH2 and WH4.

Age	Stand-Alone Storage Tank	Tankless or On Demand Water Heater	Heat Pump Water Heater	Part of the Heating System Boiler	Overall Statewide
Less than 2 years old	18.9%	16.4%	100%	7.9%	18.7%
2 to 4 years old	20.2%	83.6%	0%	72.0%	26.7%
5 to 9 years old	39.4%	0%	0%	20.1%	36.0%
10 to 14 years old	16.8%	0%	0%	0%	14.5%
15 to 19 years old	4.7%	0%	0%	0%	4.0%
Respondents (n)	36	3	1	8	48

Table 266. Primary Water Heater ENERGY STAR Rated by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH5.

ENERGY STAR®	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	82.4%	46.6%	66.7%	63.7%
No	17.6%	53.4%	33.3%	36.3%
Primary Water Heater (n)	6	14	6	26

Table 267. Primary Water Heater ENERGY STAR Rated by Construction Type

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH5.

ENERGY STAR®	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
Yes	100%	61.6%	63.7%
No	0%	38.4%	36.3%
Primary Water Heater (n)	2	24	26

Table 268. Use Supplemental Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH6.

Supplemental Water Heat	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
No	100%	100%	100%	100%
Respondents (n)	210	68	40	318

Table 269. Use Supplemental Water Heating System by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions WH6.

Supplemental Water Heat	New Construction - Built 2012 or Later	Existing Construction - Built Prior to 2012	Overall Statewide
No	100%	100%	100%
Respondents (n)	6	312	318

Table 270. Age of Primary Clothes Washer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C6.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	10.1%	27.0%	31.2%	14.7%
2 to 4 years old	40.9%	20.4%	19.7%	35.5%
5 to 9 years old	35.4%	26.5%	39.3%	33.9%
10 to 14 years old	5.5%	10.7%	9.8%	6.8%
15 to 19 years old	2.7%	5.1%	0%	3.0%
20 years old or more	5.5%	10.2%	0%	6.1%
Respondents (n)	37	25	11	73

Table 271. Water Temperature for Wash Cycle of Clothes Washer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C4.

Water Temperature	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Hot	7.6%	4.9%	7.6%	7.0%
Warm	57.2%	50.5%	60.8%	56.1%
Cold	35.3%	44.7%	31.7%	36.8%
Respondents (n)	40	26	14	80

Table 272. Water Temperature for Rinse Cycle of Clothes Washer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C5.

Water Temperature	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Hot	2.5%	0%	0%	1.8%
Warm	29.5%	28.2%	38.0%	29.8%
Cold	68.0%	71.8%	62.0%	68.3%
Respondents (n)	40	27	14	81

Table 273. Primary Clothes Dryer Fuel by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C8.

Dryer Fuel	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Electricity	76.9%	78.8%	67.1%	76.6%
Natural gas from underground pipes	23.1%	21.2%	32.9%	23.4%
Respondents (n)	35	27	13	75

Table 274. Age of Clothes Dryer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C9.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	2.2%	16.8%	21.3%	6.7%
2 to 4 years old	37.9%	20.4%	29.5%	33.5%
5 to 9 years old	41.0%	36.7%	39.3%	40.0%
10 to 14 years old	9.5%	10.7%	9.8%	9.8%
15 to 19 years old	3.2%	5.1%	0%	3.4%
20 years old or more	6.3%	10.2%	0%	6.7%
Respondents (n)	32	25	11	68

Table 275. Average Number of Clothes Washer Loads per Week by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions C3.

Loads Per Week	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	4.7	4.6	4.5	4.6
Respondents (n)	41	27	14	82

Table 276. Age of Primary Refrigerator by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions K6.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	16.2%	5.9%	7.7%	14.7%
2 to 4 years old	28.6%	34.5%	26.4%	29.2%
5 to 9 years old	34.8%	29.1%	39.6%	34.3%
10 to 14 years old	11.9%	21.6%	13.2%	13.1%
15 to 19 years old	5.0%	5.4%	9.9%	5.2%
20 years old or more	3.5%	3.6%	3.3%	3.5%
Respondents (n)	202	62	32	296

Table 277. Primary Refrigerator is ENERGY STAR by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions K7.

ENERGY STAR®	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	42.2%	25.8%	25.3%	39.4%
No	57.8%	74.2%	74.7%	60.6%
Primary Refrigerator (n)	132	40	30	202

Table 278. Presence of Standalone Freezer by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions K13 and K14.

		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Standalone freezer in home	Yes	2.0%	1.6%	4.4%	2.1%
	No	98.0%	98.4%	95.6%	97.9%
	Respondents (n)	251	81	47	379
Average standalone freezer quantity	Mean	0	0	0	0
	Respondents (n)	251	81	47	379

Table 279. Average Age of Standalone Freezers by Climate Zone

Source: Single-Family and Tenant survey questions K15a, K15b and K15c.

		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
First standalone freezer	Means	10.0	17.4	3.0	10.0
	Respondents (n)	5	3	2	10
Second standalone freezer	Mean				
	Respondents (n)	0	0	0	0
Third standalone freezer	Mean				
	Respondents (n)	0	0	0	0

Table 280. Age of Automatic Dishwasher by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question WH9.

Age	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Less than 2 years old	13.5%	6.3%	10.0%	12.2%
2 to 4 years old	30.0%	35.8%	22.5%	30.7%
5 to 9 years old	34.6%	27.6%	52.5%	34.1%
10 to 14 years old	11.5%	27.6%	7.5%	14.1%
15 to 19 years old	5.8%	0%	0%	4.6%
20 years old or more	4.6%	2.8%	7.5%	4.4%
Respondents (n)	87	39	15	141

Table 281. Average Number of Wine Chillers/Coolers by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question K11.

Number of Wine Chillers/Coolers	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	0.1	0	0	0.1
Respondents (n)	251	81	47	379

Table 282. Wine Chillers/Coolers ENERGY STAR by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question K11.

ENERGY STAR®	Climate Zone 4	Overall Statewide
Yes	18.2%	18.2%
No	81.8%	81.8%
Wine Chillers/Coolers (n)	11	11

Table 283. Presence of Swimming Pool Pump by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions P2.

Swimming Pool Pump	Climate Zone 4	Overall Statewide
No	100%	100%
Respondents (n)	2	2

Table 284. Presence of Swimming Pool Heater by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions P3.

Swimming Pool Heater	Climate Zone 4	Overall Statewide
No	100%	100%
Respondents (n)	2	2

Table 285. Internet Access at Home by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question A6.

Internet Access	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	88.9%	87.4%	82.4%	88.5%
No	11.1%	12.6%	17.6%	11.5%
Respondents (n)	251	81	47	379

Table 286. Office Equipment ENERGY STAR by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question A13.

Office Equipment		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Desktop computer	Yes	29.2%	33.8%	34.9%	30.0%
	No	70.8%	66.2%	65.1%	70.0%
	Respondents (n)	65	16	18	99
Laptop computer	Yes	40.7%	46.1%	43.0%	41.5%
	No	59.3%	53.9%	57.0%	58.5%
	Respondents (n)	135	38	28	201
LCD/LED computer monitor	Yes	43.1%	78.7%	50.5%	47.7%
	No	56.9%	21.3%	49.5%	52.3%
	Respondents (n)	51	15	17	83
Printer, scanner, all-in-one-unit	Yes	55.4%	46.6%	65.5%	55.0%
	No	44.6%	53.4%	34.5%	45.0%
	Respondents (n)	112	28	24	164

Table 287. Household has a Well Pump by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions M4a.

Well Pump	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	0.4%	0%	0%	0.4%
No	99.6%	100%	100%	99.6%
Respondents (n)	235	74	46	355

Table 288. Household has a Sump Pump by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question M4b.

Sump Pump	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	1.3%	6.1%	0%	1.8%
No	98.7%	93.9%	100%	98.2%
Respondents (n)	232	71	47	350

Table 289. Household has a Waterbed Heater by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question M4c.

Waterbed Heater	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	0.4%	1.4%	0%	0.5%
No	99.6%	98.6%	100%	99.5%
Respondents (n)	243	77	46	366

Table 290. Household has a Natural Gas Grill by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question M4d..

Natural Gas Grill	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	1.2%	6.9%	4.5%	2.1%
No	98.8%	93.1%	95.5%	97.9%
Respondents (n)	244	78	46	368

Table 291. Household has a Natural Gas Fire Pit by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question M4e.

Natural Gas Fire Pit	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	0%	1.4%	0%	0.2%
No	100%	98.6%	100%	99.8%
Respondents (n)	244	79	47	370

Table 292. Household has Radiant Floor Heating by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question M4f.

Radiant Floor Heating	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Yes	0.8%	0%	0%	0.7%
No	99.2%	100%	100%	99.3%
Respondents (n)	244	77	47	368

Table 293. Familiar with Lighting Types by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey questions L4 and L4a.

Familiarity		Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
CFLs	Yes	89.6%	93.3%	89.0%	90.0%
	No	10.4%	6.7%	11.0%	10.0%
	Respondents (n)	251	81	47	379
LEDs	Yes	71.2%	71.5%	66.9%	71.1%
	No	28.8%	28.5%	33.1%	28.9%
	Respondents (n)	251	81	47	379

Table 294. Average Number of Video Game Systems by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question A7.

Video Game System	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Mean	0.4	0.4	0.8	0.4
Respondents (n)	248	80	47	375

Table 295. Occupied Full or Part-time by Climate Zone

Totals may not sum to 100 percent due to rounding.

Source: Single-Family and Tenant survey question B2.

Occupancy	Climate Zone 4	Climate Zone 5	Climate Zone 6	Overall Statewide
Occupied part-time (<=9 months)	2.0%	2.7%	6.6%	2.3%
Occupied full-time (>9 months)	98.0%	97.3%	93.4%	97.7%
Respondents (n)	251	81	47	379

Appendix A: All Survey Instruments

Single-Family/Tenant Survey Instrument

NYSDERDA RESIDENTIAL BASELINE STUDY SINGLE-FAMILY / TENANT CODEBOOK

The survey modules included in this questionnaire are as follows:

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

NOTE:

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

Sample and Analysis Variable List

[surveyID]	Unique case identifier
[util]	Utility
[conty]	County
[region]	Region
[SampledRegion]	Regions chronologically labeled by order sampled
[ClimateZone]	Climate zone (4, 5, or 6)
[kwhct]	kWh category
	0 500 kWh or less
	1 501 to 2,500 kWh
	2 2,501 to 6,000 kWh
	3 6,001 to 12,000 kWh
	4 12,001 to 20,000 kWh
	5 20,000 kWh or more
	-2 Not asked in mini-survey
[thrmc]	Therm cat
	0 300 or less therms annually
	1 300 to 600 therms annually
	2 600 to 900 therms annually
	3 900 to 1,200 therms annually
	4 1,200 to 1,500 therms annually
	5 1,500 to 1,800 therms annually
	6 1,800 to 2,100 therms annually
	7 2,100 or more therms annually
	-2 Not asked in mini-survey
[gsrtc]	Gas rate code
sample_type	Origin of initial case data
	1 thru 8 Utility data
	99 Tax record data
[aapor]	Final disposition of case
	1100 phone complete
	1101 web complete
	1103 mini-survey complete

[Construction] Flag of construction type

3	Existing	[IF B7<>11, 12, AND 13 OR IF (B7=11, 12, OR 13 AND IF B8spe<2012)]
1	New	[IF B7=11, 12, OR 13 AND IF
	B8spe>=2012	OR SKIPPED]

[Dwelling]

Flag of dwelling type

1	Single-family	[IF B3=1, 2, 3, 5, 6, OR WAS SKIPPED]
2	Tenant	[IF B3=4]

[Recruited]

Flag of whether recruited for on-site scheduling or not

0	Not recruited	[IF D7=3 or D7 NOT ASKED (TENANT)]
1	Recruited	[IF D7=1 OR 2]
-6	Programmed skip	[D7 NOT ASKED]

[SurveyWeight]

Computed survey weight, based on climate zone, new/existing construction, and single-family or tenant dwelling type

INTRODUCTION

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

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

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

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

[Footer displayed on every page]

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

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

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

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

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

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

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

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

SCREENER

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

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

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

S1spe Who does provide electric service at [SERVICE ADDRESS]?
(Specify utility below)

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

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

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

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

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

S3A Address:
S3B City:
S3C State:
S3D Zip:

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

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

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

- 1 Occupy this home at least part of the year
- 2 Built the home with the intent to sell
- [TERMINATE]
- 2 Not asked in mini-survey
- 6 Programmed skip

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

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

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

BUILDING SHELL

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

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

o_B1 [ASK IF B1=4] Description of other type of ownership.

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

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

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

For B2bc1 through B2bc5

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

B2bc1 Spring
B2bc2 Summer
B2bc3 Fall
B2bc4 Winter
B2bc5 Varies (SPECIFY)

o_B2b [ASK IF B2bc5=1] Description of occupation time period.

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

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

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

B3a [ASK IF B3=2, 3 OR 4] Including your unit, how many individual housing units are in your [IF B3=2: in this attached rowhouse/townhouse] [IF B3=3 | 4: apartment or condominium building]? (*Enter number of units below*)

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

B3b [ASK IF B3a = -8] Do you think the total number of housing units in your building is... (*Check one*)

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

B3c [SKIP TO B4 IF B3<> 3 AND 4] Not counting the basement, how many stories are there in this apartment or condominium building? (*Enter number of stories below*)

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

B3d Does your apartment or condominium have any shops, restaurants, other retail space, or space used by businesses? *(Check one)*

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

B3e Is there more than one building in this apartment or condominium complex that includes other housing units? *(Check one)*

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

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

- ___ # of buildings [1-75]
- 2 Not asked in mini-survey
- 6 Programmed skip
- 9 Refused

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

- ___ # of bedrooms [0-25]
- 2 Not asked in mini-survey
- 9 Refused

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

- _____ square feet [1-113,000]
- 3 Nonsensical answer
- 8 Don't know
- 9 Refused

B5a [ASK IF B5 = -8] Approximately how large is your home in square feet? Please do not include unfinished basements. *(Check one)*

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

B6 [ASK IF B3 <> 3 OR 4] Does your home have a heated or unheated basement? *(Check one)*

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

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

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

B8 Has your home undergone any major renovations or additions in the past five years? A major renovation or addition, means construction activities like adding a room, or

increasing the size of your home's living space, or reconstruction due to flooding or hurricane. *(Check one)*

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

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

- | | | |
|-------|--------------------------|-------------|
| _____ | year of renovation | [2008-2014] |
| -2 | Not asked in mini-survey | |
| -6 | Programmed skip | |
| -9 | Refused | |

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

- | | | |
|----|--------------------------|--------------|
| 1 | Yes | |
| 2 | No | [SKIP TO E1] |
| -2 | Not asked in mini-survey | |
| -6 | Programmed skip | |
| -9 | Refused | |

o_B9b What equipment or building is hooked up to this other electric meter?
(Please specify other equipment or building below)

ENERGY STAR AWARENESS

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

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

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

KITCHEN APPLIANCES

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

For K1a through K1d

—	# of units	[0-9]
-9	Refused	

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

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

For K2c1 through K2c4

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

K2c1 Electricity
K2c2 Natural gas from underground pipes
K2c3 Propane (bottled gas)
K2c4 Some other fuel, specify

o_K2 [ASK IF K2c4=1] Description of other type of fuel.

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

For K3c1 through K3c4

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

K3c1 Electricity
K3c2 Natural gas from underground pipes
K3c3 Propane (bottled gas)
K3c4 Some other fuel, specify

o_K3 [ASK IF K3c4=1] Description of other type of fuel.

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

For K4c1 through K4c4

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

K4c1 Electricity
K4c2 Natural gas from underground pipes
K4c3 Propane (bottled gas)
K4c4 Some other fuel, specify

o_K4 [ASK IF K4c4=1] Description of other type of fuel.

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

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

o_K5 [ASK IF K5=7] Description of other type refrigerator.

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

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

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

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

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

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

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

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

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

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

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

For K9 through K9a

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

K9	Full size refrigerators
K9a	Compact refrigerators

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

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

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

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

K10c

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

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

K11

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

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

K11a

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

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

K11b

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

K17b [SKIP IF K14=1 OR (E1 <> 2 AND 3) OR (K14=2 AND K15a>9 AND K15a<>-8 AND K15b>9 AND K15b<>-8) OR (K14>2 AND K15a>9 AND K15a<>-8 AND K15b>9 AND K15b<>-8 AND K15c>9 AND K15c<>-8)]

Are these standalone freezers ENERGY STAR® rated? (e.g. Does it have the ENERGY STAR® logo on it?)

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

HEATING AND COOLING

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

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

H2 What is the primary type of fuel used for heating your home? (*Check one*)

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

o_H2 [ASK IF H2=10] Description of other type of primary fuel type.

H3 What type of primary heating system do you have in your home? (*Check one*)

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

o_H3 [ASK IF H3=12] Description of other type of primary heating system

H4 About how old is your primary heating system? (*Check one*)

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

H5 [ASK IF E1 = 2 OR 3 AND H4 <> 4, 5, AND 6] Is your primary heating system ENERGY STAR® rated? (e.g. Does it have the ENERGY STAR® logo on it?)

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

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

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

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

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

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

For H7aw through H7ae

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

H7aw	Wood fireplaces
H7ag	Natural gas fireplaces
H7ap	Propane fireplaces
H7ae	Electric fireplaces

H7 How many of the following do you use in your home on a regular basis in the winter?
(If none, please enter zero)

For H7b through H7d

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

H7b	Heat stoves (e.g. wood stove or pellet stove)
H7c	Portable electric heaters
H7d	Portable kerosene heaters

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

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

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

For H8ac1 through H8ac9

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

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

o_H8a [ASK IF H8ac9=1] Description of other type of fuel used.

H9 Do you have air conditioning in your home? Please include central air conditioning as well as room or window units. *(Check one)*

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

H10 [ASK IF B3 = 3 OR 4] Do you receive your air conditioning from a central cooling system that is used by other families in your apartment or condominium building? *(Check one)*

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

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

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

o_H11 [ASK IF H11=4] Description of other type of primary air conditioning equipment

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

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

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

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

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

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

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

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

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

H16 [ASK IF H15=1] What other types of air conditioning systems do you use in your home? (*Select all that apply*)

For H16c1 through H16c4

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

H16c1 Central air conditioning system
H16c2 Room or window air conditioner
H16c3 Heat pump
H16c4 Other, specify

o_H16 [ASK IF H16c4=1] Description of other type of air conditioning systems used.

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

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

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

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

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

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

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

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

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

For H23a through H23d

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

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

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

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

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

H24a [SKIP IF H22 <> 1 OR (E1 <> 2 OR 3) OR (H23a = 4, 5, OR 6)]
Is this dehumidifier ENERGY STAR® rated?
(e.g. Does it have the ENERGY STAR® logo?) (Check one)

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

H24b [SKIP IF H22=1 OR (E1 <> 2 OR 3) OR
 {H22=2 AND (H23a>3 AND H23a<>7 AND H23b>3 AND H23b<>7)} OR
 {H22=3 AND (H23a>3 AND H23a<>7 AND H23b>3 AND H23b<>7 AND H23c=>3 AND
 H23c<>7)} OR
 {H22>3 AND (H23a>3 AND H23a<>7 AND H23b>3 AND H23b<>7 AND H23c=>3 AND
 H23c<>7 AND H23d>3 AND H23d<>7)}]
 Are these dehumidifier(s) ENERGY STAR® rated?
 (e.g. Does they have the ENERGY STAR® logo on them?) (*Check one*)

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

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

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

H27 How many of the following types of ventilation equipment do you have in your home...
 (*If none, please enter zero*)

For H27c through H27a

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

H27c Ceiling fans?

H27d Exhaust fans in the kitchen?

H27e Exhaust fans in the bathrooms or another room?

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

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

WATER HEATING

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

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

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

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

o_WH2 [ASK IF WH2=5] Description of other type of primary water heating system used.

WH3 What type of fuel does your primary hot water heater use? *(Check one)*

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

o_WH3 [ASK IF WH3=8] Description of other type of primary water heating fuel used.

WH4 About how old is your primary water heating system? *(Check one)*

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

WH5 [ASK IF (E1 = 2 OR 3) AND (WH2=1 OR 4) AND (WH4 <> 4, 5, AND 6)]

Is this water heating system ENERGY STAR® rated?

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

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

WH6 [SKIP TO WH8 IF WH2=4] Do you use more than one water heating system in your home? *(Check one)*

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

WH7 What other type of system do you use as your primary water heating system? *(Check one)*

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

o_WH7 [ASK IF WH7=5] Description of other type of water heating system.

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

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

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

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

WH10

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

Is this automatic dishwasher ENERGY STAR® rated?

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

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

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

WH11

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

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

CLOTHES WASHING AND DRYING**C1a**

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

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

C1b

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

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

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

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

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

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

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

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

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

C6 About how old is your primary clothes washer? *(Check one)*

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

C6b [ASK IF (E1 = 2 OR 3) AND C6 <> 4, 5, AND 6]
Is this clothes washer ENERGY STAR® rated?
(e.g. Does it have the ENERGY STAR® logo on it?) *(Check one)*

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

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

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

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

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

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

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

o_C8 [ASK IF C8=4] Description of other type of fuel used for clothes drying.

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

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

C10 Is your clothes dryer a heat pump clothes dryer? A heat pump clothes dryer is a fairly new technology that pulls energy from the air just like a heat pump heating and cooling system. The hot air is not vented but is reused to dry the clothes. They use 50% less energy, but take longer to dry clothes. *(Check one)*

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

HOME LIGHTING

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

For L2c1 through L2c4

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

L2c1 Skylights
L2c2 Tubular skylights, also referred to as solar tubes or sun tunnels (What is that?)
L2c3 Large uncovered window areas
L2c4 None of the above

L3 Which of the following types of lighting controls do you use inside or outside your home?
 home?
 (*Select all that apply*)

For L2c1 through L2c4

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

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

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

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

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

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

L5 How many light bulbs inside your home are typically used two or more hours each day?
(Enter number of bulbs below. If none, please enter zero)

For L5a through L5c

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

L5a CFL/LED Bulbs
L5b Incandescent Bulbs
L5c Other bulbs

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

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

L8 [ASK IF (L4 OR L4a = 1) AND L7 <> 0 OR -9] How many of the [L7] outdoor lights used two or more hours each day are CFL or LED lights?
(Enter number of bulbs below)

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

POOL AND SPA

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

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

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

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

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

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

P2b [SKIP TO P3 IF P2 <> 1] Is the pool pump a high efficiency pool pump? (*Check one*)

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

P2c Do you have an automatic timer that controls the time of day that your pool pump operates? *(Check one)*

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

P3 Do you have a pool heater? *(Check one)*

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

[SKIP TO P4a]

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

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

o_P3b [ASK IF P3b=5] Description of other pool heater fuel.

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

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

[SKIP TO P5]

[SKIP TO A2]

P4b [ASK IF B3 = 3 OR 4] Do you have a hot tub, spa, or jetted tub/Jacuzzi for your use only?
Please do not include a community hot tub, spa, or Jacuzzi that is shared with others in
your apartment or condominium complex. (*Check one*)

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

P5 What type of fuel is used to heat the water in your hot tub, spa, or jetted tub/Jacuzzi?
(*Check one*)

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

o_P5 [ASK IF P5=5] Description of other type of fuel used for hot tub heating.

SMALL HOUSEHOLD APPLIANCES

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

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

For A2a through A2d

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

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

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

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

For A3a through A3d

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

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

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

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

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

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

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

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

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

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

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

For A7a through A7l

—	# of equipment [0-20]
-5	Programming change
-9	Refused

A7a	Desktop computer (excluding monitor)
A7d	CRT computer monitors (What is a CRT monitor?)
A7e	LED/LCD flat screen computer monitors (What is a LED/LCD monitor?)
A7b	Laptop computer
A7c	iPads, tablet computers
A7f	eReaders such as a Kindle or Nook
A7g	Combination printer, copier, scanner, or fax
A7h	Individual printer
A7i	Individual copier
A7j	Individual fax machine
A7k	Individual scanner
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
-2	Not asked in mini-survey
-8	Don't know
-9	Refused

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

- 1 Tier 1 smart strip that turn off when your computer is powered off or goes to sleep
- 2 Tier 2 smart strip that turns off when you leave or is programmed to turn off at a certain time of the night or day
- 3 Both Tier 1 and Tier 2 smart strip
- 2 Not asked in mini-survey
- 6 Programmed skip
- 8 Don't know
- 9 Refused

A9a [SKIP IF A7a = 0 OR -9] About how many hours each day do all residents typically use the desktop computer(s) in your home? *(Enter number of hours below)*

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

A9b [SKIP IF A7b = 0 OR -9] About how many hours each day do all residents typically use the laptop computer(s) in your home? *(Enter number of hours below)*

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

A10 [SKIP IF A7a AND A7b = 0 OR -9] When you are not using your computer, do you typically shut down the computer? This is not the same as letting it go to sleep or simply closing the cover. *(Check one)*

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

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

- 1 Yes
- 2 No
- 9 Refused

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

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

o_A11bb What type of business is this? *(Please describe below)*

[RECORD RESPONSE VERBATIM]

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

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

o_A11c [ASK IF A11C=2] Description of other type of energy-using equipment.

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

A12 How many of each of the following other types of entertainment or telecommunications equipment does your household use?
(If none, please enter zero. Please scroll to see all equipment options.)

For A12ab through A12l

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

A12ab	Combination cable, satellite, or set-top box with DVR unit
A12a	Cable, satellite, or set-top box (What is a set-top box?)
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
A12h	MP3 players (for example, iPod)
A12i	Cell phones/Smart phones
A12j	Cordless telephones
A12k	Stereo system
A12l	Digital photo album

A12n Any other type of entertainment or telecommunications equipment?

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

o_A12no [SKIP IF A12n = 2] Description of other type entertainment or telecommunications equipment.

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

For A13a through A13i

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

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

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

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

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

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

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

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

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

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

MISCELLANEOUS EQUIPMENT

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

- 1 Yes
- 2 No
- 9 Refused

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

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

- 1 Yes
- 2 No
- 9 Refused

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

- 1 Yes
- 2 No
- 9 Refused

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

For M4a through M4f

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

M4a Well pump (What is a well pump?)
M4b Sump pump (What is a sump pump?)
M4c Waterbed heater
M4d Natural gas grill
M4e Natural gas fire pit
M4f Radiant floor heating separate from heating system (What is floor heating?)

M5 Does anyone in your household use any other major appliances or equipment in your home that use a lot of energy such as exercise equipment, welding equipment or heavy tools, or equipment used for a home business? (*Check one*)

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

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

For M5ac1 through M5ac16

0	Not mentioned
1	Mentioned
-6	Programmed skip

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

o_M5a [ASK IF M5ac16=1] Description of miscellaneous type of other major appliances or equipment.

M6 Does your household use an energy management system? An energy management system provides real-time information on your energy usage and allows you to control temperature settings, turn off lights, and appliances remotely.

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

UTILITY COMPANY

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

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

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

- 1 Agway Energy Services, LLC
- 2 Alpha Gas And Electric, LLC
- 3 Ambit New York, LLC
- 4 American Power & Gas LLC
- 5 Atlantic Energy LLC
- 6 Bath Electric, Gas & Water System
- 7 Bluerock Energy, Inc.
- 8 Central Hudson Gas & Electric Corporation
- 9 Chautauqua Utilities, Inc.
- 10 Citizens Choice Energy, LLC
- 11 Columbia Utilities, LLC
- 12 Consolidated Edison Company Of N Y, Inc.
- 13 Constellation Energy Gas Choice, Inc.
- 14 Corning Natural Gas Corporation
- 15 Crown Energy Services, Inc
- 16 Direct Energy Services, LLC
- 17 Empire State Pipeline
- 18 Energy Cooperative Of America, Inc.
- 19 Energy Discounters, LLC
- 20 Energy Plus Natural Gas LLC
- 21 Energymark, LLC
- 22 Family Energy Inc.
- 23 Filmore Gas Company, Inc.
- 24 Gateway Energy Services Corporation
- 25 Hiko Energy LLC
- 26 Hudson Energy Services, LLC
- 27 IDT Energy, Inc.

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

o_U1a [ASK IF U1a=56] Specify other gas utility.

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

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

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

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

U3 [ASK IF (B3 = 3 OR 4) AND HAS FUEL OIL FOR HEATING OR WATER HEATING (H2=5, H8ac5=1 or WH3=5)]
Does your household pay for fuel oil directly, or is it included in your rent or condominium fee?

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

U5 [ASK IF (B3 = 3 OR 4) AND HAS PROPANE FOR HEATING OR WATER HEATING (H2=3, H8ac3=1, or WH3=3)]
Does your household pay for propane directly, or is it included in your rent or condominium fee?

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

U8 In the past 5 years, has your household participated in any energy efficiency or energy saving programs offered by NYSERDA or your utility company to make your home or appliances more energy efficient? *(Check one)*

- 1 Yes
- 2 No
- 9 Refused

U9 [ASK IF U8=1] What type of equipment did you install or recycle through a program?
(Select all that apply)

For U9c1 through U9c9

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

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

o_U9 [ASK IF U9=9] Description of other type of equipment.

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

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

For U10c1 through U10c9

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

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

o_U10 [ASK IF U10c7=1] Description of other reason why household hasn't participated.

U12 Are you considering replacing or purchasing any of the following in the next five years?
(Select all that apply)

For U12c1 through U12c7

- 0 Not mentioned
- 1 Mentioned
- 9 Refused

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

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

For U13c1 through U13c7

- 0 Not mentioned
- 1 Mentioned
- 9 Refused

U13c1 Insulation or weatherization measures
U13c2 Heating equipment
U13c3 Air conditioning equipment
U13c4 Water heating equipment
U13c5 Clothes washer
U13c6 Appliances
U13c7 None of the above

U14 [SKIP IF REP<>99 (NOT SUPPLEMENTAL NEW CONSTRUCTION SAMPLE)]
Please provide your best estimate of the total electric costs your home paid in the last 12 months. Do not include natural gas or other fuels. *(Check one)*

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

***U14_Consumption**

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

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

DEMOGRAPHICS

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

For D2_5 through D2_65

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

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. Masters or Doctorate degree)
- 2 Not asked in mini-survey
- 9 Refused

D4 For classification purposes only, which of the following best describes your household's total income in 2012? *(Check one)*

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

D5 What is your gender?

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

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

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

D6 Name of apartment complex: _____
D6m Property Owner or Manager's Name: _____
D6t Telephone number (###-###-####): _____

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

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

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

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

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

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

D8 First and Last name of person to ask for
D8b Address
D8c City
D8h State
D8d Zip Code
D8e Main number
D8f Secondary number
D8g E-mail

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

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

D9 Please enter your correct mailing address:

D9aa Name
D9b Street Address
D9c City
D9d State
D9e Zip code

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

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

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

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

o_D10 [ASK IF D10=1] Comments from the respondent [END SURVEY]

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

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

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

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

Multifamily Property Owner or Manager Survey Instrument

NYSERDA RESIDENTIAL BASELINE STUDY – MULTIFAMILY PROPERTY OWNER/MANAGER CODEBOOK

The survey modules included in this questionnaire are as follows:

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

NOTE:

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

Sample Variable List

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

INTRODUCTION

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

1 Yes

2 No [ATTEMPT TO CONVERT]

[RENTER'S ADDRESS: [RENT ADDRESS]]

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

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

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

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

[This call should take about 30 minutes.]

[PRESS 1 TO CONTINUE]

PROPERTY CHARACTERISTICS

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

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

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

S1

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

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

[RENTER'S ADDRESS: [RENT ADDRESS]]

S1_7_oth

Description of other type of job title (see S1 above)

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

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

S1a_5_oth Description of other type of electric meter set-up (see S1a above)

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

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

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

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

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

S3 About how many separate multifamily buildings are located at your multifamily property at [COMPLEX_NAME OR RENTADDR]?

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

[RENTER'S ADDRESS: [RENT ADDRESS]]

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

- 1 Yes
- 2 No [SKIP TO S7]
- 8 Don't know [SKIP TO S7]
- 9 Refused [SKIP TO S7]

S5 How many other properties does your organization own/manage in New York State?

___ # of other properties [1-750]

-6 Programmed skip

-8 Don't know

-9 Refused

S6 Were any of these other properties built since January 2012?

1 Yes

2 No

-6 Programmed skip

-8 Don't know

-9 Refused

S7 Now focusing on the multifamily property at [COMPLEX_NAME OR RENTADDR],
[IF S3=1: Does this building / IF S3>1: Do any of these buildings] contain any shops,
restaurants retail space, or space used by any other business?

- | | | |
|----|------------|---------------|
| 1 | Yes | |
| 2 | No | [SKIP TO S10] |
| -8 | Don't know | [SKIP TO S10] |
| -9 | Refused | [SKIP TO S10] |

S8 What types of business? [SELECT ALL THAT APPLY]

For S8_1 through S8_6

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

- | | |
|-------------|-----------------------|
| S8_1 | Office/professional |
| S8_2 | Food sales or service |
| S8_3 | Retail |
| S8_4 | Education |
| S8_5 | Health care |
| S8_6 | Other [SPECIFY] |

S8_6_oth Description of other type of business (see S8 above)

S9 Approximately what percentage of the total floor space at this property is allocated to non-residential business space?

___	Percentage	[1-100%]
-6	Programmed skip	
-8	Don't know	
-9	Refused	

S10 About how many living units are located in [IF S3=1: the multifamily building] [IF S3>1: all of the multifamily buildings] at [COMPLEX_NAME OR RENTADDR]? [Probe for all units at the property and not just one building]

_____	# living units	[1-7500]
-8	Don't know	
-9	Refused	

[RENTER'S ADDRESS: [RENT ADDRESS]]

S11 [ASK IF S10=-8] Do you think the total number of housing units at your property is 100 or more, 99 to 76, 75 to 50, 49 to 5, or less than 5?

- 1 100 or more
- 2 99 to 76
- 3 75 to 50
- 4 49 to 5
- 5 Less than 5
- 6 Programmed skip
- 8 Don't know
- 9 Refused

S12 What percentage of the units at your property are occupied?

- ___ % of occupied [0-100%]
- 8 Don't know
- 9 Refused

S13 Not counting the basement, how many stories [IF S3=1: does this multifamily building have/IF S3>1: on average, do these multifamily buildings have]?

- ___ # of stories [1-75] [YOUR BEST ESTIMATE IS FINE]
- 8 Don't know
- 9 Refused

S14 Are there other enclosed buildings at this multifamily property that are used for common area purposes, such as a utility shed, pool house, or a community center?

- | | | |
|----|------------|---------------|
| 1 | Yes | |
| 2 | No | [SKIP TO S17] |
| -8 | Don't know | [SKIP TO S17] |
| -9 | Refused | [SKIP TO S17] |

S15 How many other buildings?

- | | | |
|----|----------------------|--------|
| — | # of other buildings | [1-75] |
| -6 | Programmed skip | |
| -8 | Don't know | |
| -9 | Refused | |

S16 What [IF S15=1: is this building; IF S15>1: are these buildings] used for?
[SELECT ALL THAT APPLY]

For S16_1 through S16_10

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

S16_1	Gym or exercise room
S16_2	Club house
S16_3	Rental office
S16_4	Laundry
S16_5	Maintenance equipment shed
S16_6	Storage units
S16_7	Community center
S16_8	Boiler room
S16_9	Garage
S16_10	Other [SPECIFY]
S16_10_oth	Description of other building use (see S16 above)

[Note: Option 13 added on 01/02/2014]

S17 In approximately what year was this multifamily property built?
[PROBE WITH CATEGORIES AS NEEDED]

- 1 1939 or earlier
- 2 1940 to 1949
- 3 1950 to 1959

4	1960 to 1969
5	1970 to 1979
6	1980 to 1989
7	1990 to 1999
8	2000 to 2009
9	2010
10	2011
11	2012
12	2013
13	2014
-8	Don't know
-9	Refused

S18

Has this property undergone any major renovations, remodels, or additions in the PAST five years? This could include activities such as adding more multifamily buildings or units, adding additional common area space, installing new systems, or reconstruction due to flooding or hurricane.

1	Yes	
2	No	[SKIP TO S18b]
-8	Don't know	[SKIP TO S18b]
-9	Refused	[SKIP TO S18b]

S18a What types of major renovations, remodels, or additions did you make in the PAST five years? Was it... [SELECT ALL THAT APPLY] [READ CATEGORIES]

For S18a_1 through S18a_10

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

S18a_1 Increasing the number of units

S18a_2 Additions to common area space

S18a_3 Major renovations to the building

S18a_4 Any reconstruction due to flooding or hurricane damage

S18a_5 Adding new systems such as central AC, heating, water heating

S18a_6 Anything else [SPECIFY]

***S18a_9** Lighting upgrades

***S18a_10** Cosmetic upgrades (painting, carpets, landscaping)

S18a_6_oth Description of other type of renovation, remodels, or additions. (see S18a above)

S18b Do you plan to complete any major renovation projects or additions in the NEXT five years?

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

S18b_1_oth What type of major renovation projects or additions do you plan to do in the next five years? (see S18b above)

***S18ba** What type of major renovation projects or additions do you plan to do in the next five years? [CATEGORIZED] (see S18b above)

For S18ba_1 through S18ba_10

0	Not mentioned
1	Mentioned
-6	Programmed skip

***S18ba_1** Increasing the number of units

***S18ba_2** Additions to common area space

***S18ba_3** Major renovations to the building

***S18ba_4** Any reconstruction due to flooding or hurricane damage

***S18ba_5** Adding new systems such as central AC, heating, water heating

***S18ba_6** Other [SPECIFY]

***S18ba_9** Lighting upgrades

***S18ba_10** Cosmetic upgrades (painting, carpets, landscaping)

S18ba_6_oth Description of other type of major renovation project or addition planned in the next five years? (see S18ba above)

S19 [IF S10<>-8 OR -9: Of the [INSERT S10 RESPONSE] units] [IF S10=-8 OR -9: Of all the living units at [COMPLEX_NAME OR RENTADDR]], approximately what percentage of these are studios, one bedroom units, two bedroom units, and three or more bedroom units?

[THESE CATEGORIES NEED TO ADD UP TO 100 PERCENT]

For S19a through S19d

____ [0-100%]

-8 Don't know

-9 Refused

S19a % of studios

S19b % of 1 bedroom units

S19c % of 2 bedroom units

S19d % of 3 or more bedroom units

S19_sum [ASK IF S19a THROUGH S19d DO NOT SUM TO 100% AND NONE = -8 OR -9] The quantities that you have given me do not add up to 100%. Can you please tell me which to correct?

[PRESS 1 TO BACK UP AND CORRECT]

S23 Does your property have natural gas service?

1 Yes

2 No [SKIP TO E1]

-8 Don't know [SKIP TO E1]

-9 Refused [SKIP TO E1]

S24

How is the NATURAL GAS service metered from your utility for this building? Is it one master meter with no individual tenant unit meters, individual metered plus separate meters for common areas, or are all individual units metered with no master meter?

- 1 One master meter – no individual tenant unit meters
- 2 Individually metered plus separate meters for common area
- 3 All individually metered tenant units, no master meter
- 4 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

S24_4_oth

Description of other type of gas meter set-up (see S24 above)

ENERGY STAR AWARENESS

E1 Before I ask about the energy using equipment at your property, I'd like to ask about your familiarity with the ENERGY STAR logo. The ENERGY STAR logo is usually a blue and white sticker on an appliance that says "ENERGY STAR" on it.

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

- 1 Not at all familiar
- 2 Somewhat familiar
- 3 Very familiar
- 8 Don't know
- 9 Refused

E2 Buildings can also be rated for efficiency. [IF S15=1: Is this building/IF S15>1: Are these buildings] classified as being ENERGY STAR qualified, LEED certified, or a Zero Net Energy building? [SELECT ALL THAT APPLY]

For E2_1 through E2_4

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

E2_1 ENERGY STAR qualified

E2_2 LEED certified

E2_3 Zero net energy

E2_4 None

HEATING AND COOLING

H1 Does this property have a central system that provides HEATING to multiple living units or does each unit have its own heating system?

- 1 Central heating system
- 2 Each unit has its own heating system

H2 What is the primary type of fuel used by [IF H1=1, show “the central heating system” or IF H1=2, show “the heating system in each unit”] at this multifamily property?
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 District Steam
- 5 Fuel oil
- 6 Kerosene
- 7 Wood/wood pellets
- 8 Solar
- 9 Geothermal
- 10 Other
- 8 Don’t know
- 9 Refused

H2a_opn [ASK IF H2=10] Specify what other type of fuel is used for heating (see H2 above)

H3

What type of primary heating system is used [IF H1=1, show “for the central heating system” or IF H1=2, show “for the heating system in each unit”] at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

- 1 Forced air furnace with ducts to individual rooms
- 2 Central boiler with radiators or pipes in each room [Steam / H2O]
- 3 District steam with radiators or pipes in each room
- 4 Air source Heat pump
- 5 Ground source Heat pump
- 6 Baseboard heat
- 7 Heating stove burning wood or coal
- 8 Fireplace
- 9 Portable electric heater
- 10 Portable kerosene heater
- 11 Solar panels
- 12 Other [SPECIFY]
- 8 Don't know
- 9 Refused

H3a_opn

[ASK IF H3=12] Specify what other type of heating system is used. See H3 above.

H3b [ASK IF H3=2] Is the central boiler steam or hot water?

1 Steam

2 Hot water

-4 Interviewer mistake

-6 Programmed skip

-8 Don't know

-9 Refused

H4 About how old is [IF H1=1, show "the central heating system" or IF H1=2, show "are the majority of the heating systems in each unit"]?

[PROBE WITH CATEGORIES AS NEEDED]

1 Less than 2 years old

2 2 to 4 years old

3 5 to 9 years old

4 10 to 14 years old

5 15 to 19 years old

6 20 years old or more

-8 Don't know

-9 Refused

H5 [ASK IF E1=2 OR 3 AND H4=1, 2, OR 3] [IF H1=1, show “Is the central heating system” or IF H1=2, show “Is the heating system in each unit”] ENERGY STAR rated?

[PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don’t know
- 9 Refused

H6 Do you usually have a tune up done [IF H1=1, show “on the central heating system” or IF H1=2, show “on the heating system in each unit”] each year by a heating contractor or by yourself?

- 1 Yes, done by a heating contractor
- 2 Yes, do it myself
- 3 No
- 8 Don’t know
- 9 Refused

H7 Does your property have a central system that provides COOLING to multiple living units, or do you provide each unit its own air conditioning system, or do you not provide any air conditioning?

- 1 Central cooling system
- 2 Individual in-unit cooling systems
- 3 No air conditioning provided [SKIP TO WH1]
- 8 Don’t know
- 9 Refused

H8

About how old are the majority of [IF H7=1, SHOW “the central cooling systems” OR IF H7=2, SHOW “the cooling systems in each unit”] at this multifamily property?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Less than 2 years old
- 2 2 to 4 years old
- 3 5 to 9 years old
- 4 10 to 14 years old
- 5 15 to 19 years old
- 6 20 years old or more
- 6 Programmed skip
- 8 Don’t know
- 9 Refused

H9

[ASK IF E1=2 OR 3 AND H8=1, 2, OR 3] Is/are the majority of [IF H7=1, show “the central cooling system[s]” or IF H7=2, show “the cooling system in each unit[s]”] ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

- 1 Yes
- 2 No
- 6 Programmed skip
- 8 Don’t know
- 9 Refused

H10

Do you usually have a tune up done on the air conditioning system[s] each year?

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

WATER HEATING

WH1 Does your property have a central system that provides domestic HOT WATER to multiple living units?

- 1 Yes
- 2 No [SKIP TO A1]
- 8 Don't know
- 9 Refused

WH2 What type of system is the primary water heating system used at this property? Is it a stand-alone storage tank, a tankless or on demand water heater, a heat pump water heater, part of your heating system boiler, or something else?

- 1 Stand-alone storage tank
- 2 Tankless or on demand water heater
- 3 Heat pump water heater
- 4 Part of heating system boiler
- 5 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

WH2a_opn [ASK IF WH2=5] Specify what other type of water heating system used (see WH2a above)

WH3

What is the primary type of fuel used for WATER HEATING at your property?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 District Steam
- 5 Fuel Oil
- 6 Kerosene
- 7 Solar
- 8 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

WH3a_opn

[ASK IF WH3=8] Specify what other fuel used for water heating fuel used (see WH3 above)

WH4

About how old is your primary water heating system?

[PROBE WITH CATEGORIES AS NEEDED]

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

WH5

[ASK IF E1=2 OR 3 AND WH4=1, 2, OR 3] Is this water heating system ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

TENANT APPLIANCES

A1 Which of the following appliances do you supply to your tenants in their living units at this multifamily property? [READ LIST; SELECT ALL THAT APPLY]

For A1_1 through A1_9

- | | | |
|----|---------------|--------------|
| 0 | Not mentioned | |
| 1 | Mentioned | |
| -8 | Don't know | [SKIP TO A4] |
| -9 | Refused | [SKIP TO A4] |

- | | | |
|------|------------------------|--------------|
| A1_1 | Refrigerator | |
| A1_2 | Stove | |
| A1_3 | Dishwasher | |
| A1_4 | Microwave | |
| A1_5 | Portable space heater | |
| A1_6 | In-unit clothes washer | |
| A1_7 | In-unit clothes dryer | |
| A1_8 | In-unit water heater | |
| A1_9 | None | [SKIP TO A4] |

A2_1

[ASK IF A1_1=1] On average, about how old are the majority of the refrigerators at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

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

A3_1

[ASK IF A1_1=1 AND E1=2 OR 3 AND A2_1=1, 2, OR 3] Are the majority of the refrigerators ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A2_2

[ASK IF A1_2=1] On average, about how old are the majority of the stoves at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

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

A3_2

[ASK IF A1_2=1 AND E1=2 OR 3 AND A2_2=1, 2, OR 3] Are the majority of the stoves ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A2_3

[ASK IF A1_3=1] On average, about how old are the majority of the dishwashers at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

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

A3_3

[ASK IF A1_3=1 AND E1=2 OR 3 AND A2_3=1, 2, OR 3] Are the majority of the dishwashers ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A2_4

[ASK IF A1_4=1] On average, about how old are the majority of the microwaves at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

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

A3_4

[ASK IF A1_4=1 AND E1=2 OR 3 AND A2_4=1, 2, OR 3] Are the majority of the microwaves ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A2_5

[ASK IF A1_5=1] On average, about how old are the majority of the portable space heaters at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

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

A3_5

[ASK IF A1_5=1 AND E1=2 OR 3 AND A2_5=1, 2, OR 3] Are the majority of the portable space heaters ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A2_6

[ASK IF A1_6=1] On average, about how old are the majority of the in-unit clothes washers at this multifamily property?

[PROBE WITH CATEGORIES AS NEEDED]

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

A3_6

[ASK IF A1_6=1 AND E1=2 OR 3 AND A2_6=1, 2, OR 3] Are the majority of the in-unit clothes washers ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A2_7

[ASK IF A1_7=1] On average, about how old are the majority of the in-unit clothes dryers at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

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

A3_7

[ASK IF A1_7=1 AND E1=2 OR 3 AND A2_7=1, 2, OR 3] Are the majority of the in-unit clothes dryers ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A2_8

[ASK IF A1_8=1] On average, about how old are the majority of the in-unit water heaters at this multifamily property? [PROBE WITH CATEGORIES AS NEEDED]

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

A3_8

[ASK IF A1_8=1 AND E1=2 OR 3 AND A2_8=1, 2, OR 3] Are the majority of the in-unit water heaters ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

A4 What is the primary type of fuel used for COOKING at your property?
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Other [SPECIFY]
- 8 Don't know
- 9 Refused

A4_4_opn Description of other type of primary fuel used for cooking (see A4 above)

LIGHTING

L1 Do you have any of the following natural lighting at this property in INDOOR common areas during the day? [READ LIST; SELECT ALL THAT APPLY]

For L1_1 through L1_4

- 0 Not mentioned
- 1 Mentioned
- 8 Don't know [SKIP TO A4]
- 9 Refused [SKIP TO A4]

L1_1 Skylights

L1_2 Tubular skylights that let daylight in through the roof

L1_3 Large uncovered window areas

L1_4 None

L2 Which of the following types of LIGHTING CONTROLS do you use in INDOOR COMMON AREAS of your property? Do you use . . . [READ LIST; SELECT ALL THAT APPLY]

For L2_1 through L2_4

0 Not mentioned

1 Mentioned

-8 Don't know [SKIP TO A4]

-9 Refused [SKIP TO A4]

L2_1 Dimmer switches

L2_2 Occupancy/motion sensors

L2_3 Timers

L2_4 None

L3 I'm going to read a list of different types of lighting. For each type please indicate approximately what percentage of the TOTAL general INDOOR common space is lit by that type of lighting? All of the categories should add up to 100 percent.

For L3a through L3i

____ [0-100%]
-8 Don't know
-9 Refused

L3a Incandescent light bulbs

L3b T12s

L3c T8s

L3d T5s

L3e Compact fluorescent light or CFL bulbs

L3f Halogen bulbs

L3g High intensity discharge lamps such as high pressure sodium, metal halide or mercury vapor

L3h LED bulbs

L3i Something else [SPECIFY]

L3i_a_opn [ASK IF L3i<>0] Specify what other lighting is used in indoor common spaces. (see L3 above)

L3_sum [ASK IF L3a THROUGH L3i DO NOT SUM TO 100% AND NONE = -8 OR -9] The quantities that you have given me do not add up to 100%. Can you please tell me which to correct? [PRESS 1 TO BACK UP AND CORRECT]

L4 Using the same list, please indicate approximately what percentage of the TOTAL general OUTDOOR common space, such as walkways, parking lots, and parking garages is lit by the following lighting types? Once again, all of the categories should add up to 100 percent.

For L4a through L4i

____ [0-100%]

-3 No outdoor lighting at property [SKIP TO DP1]

-4 Interviewer mistake

-8 Don't know

-9 Refused

L4a Incandescent light bulbs

L4b T12s

L4c T8s

L4d T5s

L4e Compact fluorescent light or CFL bulbs

L4f Halogen bulbs

L4g High intensity discharge lamps such as high pressure sodium, metal halide or mercury vapor

L4h LED bulbs

L4i Something else [SPECIFY]

L4i_a_opn [ASK IF L4i<>0, -8, or -9] Specify what other lighting is used in indoor common spaces.
(see L4 above)

L4_sum [ASK IF L4a THROUGH L4i DO NOT SUM TO 100% AND NONE = -8 OR -9] The quantities
that you have given me do not add up to 100%. Can you please tell me which to correct?
[PRESS 1 TO BACK UP AND CORRECT]

Note: New option L5_8 added on 04Mar2014.

L5 Do you use OUTDOOR lighting at this location for parking, sidewalks, security lights, decorative lighting, outdoor signage, or something else? [SELECT ALL THAT APPLY]

For L5_1 through L5_5

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

L5_1 Parking

L5_2 Security lights

L5_3 Decorative lighting

L5_4 Outdoor signage

L5_5 Other [SPECIFY]

L5_8 Sidewalks / Walkways

L5_5_oth Description of other outdoor lighting use (see L5 above)

PURCHASING DECISIONS

DP1 Who is involved in making the decision whether to install energy efficient equipment in common areas and in-unit at your property?

[DO NOT READ; SELECT ALL THAT APPLY]

For DP1_1 through DP1_8

0 Not mentioned

1 Mentioned

-8 Don't know

-9 Refused

DP1_1 Owner

DP1_2 Property/leasing manager/associate

DP1_3 Senior property manager

DP1_4 Maintenance supervisor

DP1_5 Purchasing manager

DP1_6 Condo or co-op board

DP1_7 Tenants

DP1_8 Other [SPECIFY]

***DP1_12** Managing agent

***DP1_13** Corporate

***DP1_14** President / Vice President

***DP1_15** District manager / Regional manager

DP1_8_oth Description of other decision maker (see DP1 above)

DP2

In what year was the last time that you made any energy efficiency improvements to this property?

_____ Year [1900-2013]

-7 Never

-8 Don't know

-9 Refused

DP3 What energy efficiency improvements were made to COMMON AREAS at this property?
[DO NOT READ; RECORD ALL THAT APPLY]

For DP3_1 through DP3_9

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

DP3_1 None

DP3_2 Heating equipment

DP3_3 Cooling equipment

DP3_4 Water heating equipment

DP3_5 Insulation

DP3_6 Lighting

DP3_7 Appliances

DP3_8 Windows

DP3_9 Other [SPECIFY]

***DP3_12** Doors

***DP3_13** Water saving devices

DP3_9_oth Description of other energy efficiency improvements made to common areas (see DP3 above)

DP4 What energy efficiency improvements were made to INDIVIDUAL UNITS at this property? [DO NOT READ; RECORD ALL THAT APPLY]

For DP4_1 through DP4_9

- 0 Not mentioned
- 1 Mentioned
- 8 Don't know

-9 Refused

DP4_1	None
DP4_2	Heating equipment
DP4_3	Cooling equipment
DP4_4	Water heating equipment
DP4_5	Insulation
DP4_6	Lighting
DP4_7	Appliances
DP4_8	Windows
DP4_9	Other [SPECIFY]
*DP4_12	Doors
*DP4_13	Water saving devices

DP4_9_oth Description of other energy efficiency improvements made to individual units (see DP4 above)

DP5 What types of energy saving upgrades do you think are needed at this facility?

[DO NOT READ LIST; RECORD ALL THAT APPLY]

For DP5_1 through DP5_9

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

DP5_1	None
DP5_2	Heating equipment

DP5_3	Cooling equipment
DP5_4	Water heating equipment
DP5_5	Insulation
DP5_6	Lighting
DP5_7	Appliances
DP5_8	Windows
DP5_9	Other [SPECIFY]
*DP5_12	Doors
*DP5_13	Water saving devices
DP5_9_oth	Description of other type of energy saving upgrades needed (see DP5 above)
DP6	[SKIP IF DP5 = 1, -8, OR -9] Why have these energy efficiency improvements not been made at this facility? [DO NOT READ LIST; RECORD ALL THAT APPLY]

For DP6_1 through DP6_7

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

DP6_1	Not compatible with existing equipment
DP6_2	Initial purchase cost
DP6_3	Tenant pays utility bill
DP6_4	Length of payback period
DP6_5	No rebate offered
DP6_6	Too intrusive
DP6_7	Other [SPECIFY]
*DP6_10	Not really needed

*DP6_11	No approval from upper management
*DP6_12	Haven't gotten to it
*DP6_13	In the process
*DP6_14	Recently took ownership

DP6_7_oth Description of other reason why energy efficiency improvements have not been made (see DP6 above)

DP7 Property owners and managers often consider many different factors when deciding which type of energy-using equipment to purchase for their properties. On a scale of 1 to 5, with 1 being "not at all important," and 5 being "very important," how important are each of the following in your firm's decision of which equipment to purchase?

[SPECIFY FOR EACH ITEM]

For DP7a through DP7l

- Record importance [1-5]
- 8 Don't know
- 9 Refused

DP7a	Compatibility with existing equipment/ property systems
DP7b	Initial purchase cost
DP7c	Operating cost
DP7d	Length of payback period
DP7e	Recommendation of contractor or supplier
DP7f	Efficiency level of equipment
DP7g	Rebate from utility or other source
DP7h	Recommendations of others that had experience with equipment
DP7i	Tenant dissatisfaction with current conditions
DP7j	Ability to charge a higher rent for a more comfortable property
DP7k	Societal pressure to purchase equipment that is environmentally friendly

DP7I Resiliency, or quality and durability of the equipment

DP8 Are you aware of energy efficiency programs offered to multifamily properties by NYSERDA or your utility?

- | | | |
|----|-------------------|----------------|
| 1 | Yes [Which ones?] | |
| 2 | No | [SKIP TO DP11] |
| -8 | Don't know | [SKIP TO DP11] |
| -9 | Refused | [SKIP TO DP11] |

DP8_1_oth Which energy efficiency programs are you aware of? (See DP8 above)

***DP8_1a** Which energy efficiency programs are you aware of? [CATEGORIZED]
(see DP8_1_oth above)

For DP8_1a_1_1 through DP8_1a_13

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

*DP8_1a_1	HVAC
*DP8_1a_2	Appliances
*DP8_1a_3	Energy Audit
*DP8_1a_4	Windows/Doors/Weatherization
*DP8_1a_5	Lighting
*DP8_1a_6	Water heating equipment
*DP8_1a_7	Convert to natural gas

*DP8_1a_8	Multifamily Performance program
*DP8_1a_9	ENERGY STAR homes
*DP8_1a_10	Water saving devices
*DP8_1a_11	Thermostats
*DP8_1a_12	Other [SPECIFY]
*DP8_1a_13	Can't name any
*DP8_1a_12_oth	Description of other energy efficiency programs they were aware of (see DP8_1a above)

[Note: Added categories 14 and 15 on 1/30/14.]

DP9 How do you prefer to hear about these types of energy efficiency programs?

[DO NOT READ; SELECT ALL THAT APPLY]

For DP9_1 through DP9_11

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

DP9_1	Someone come to me and explained the program [PROBE: Who?]
DP9_2	Through the Apartment association
DP9_3	My utility Account Manager
DP9_4	Property owner
DP9_5	Utility bill insert
DP9_6	Website [Which ones?]
DP9_7	Direct mailing from utility
DP9_8	Independent contractor

DP9_9 Subway ad

DP9_10 Billboard ad

DP9_11 Other [SPECIFY]

DP9_14 Email

DP9_15 Phone

DP9_1_oth Who came and explained these types of energy efficiency programs?
(see DP9 above)

DP9_6_oth Which websites did you hear about these types of energy efficiency programs?
(see DP9 above)

DP9_11_oth Description of other way you prefer to hear about these types of energy efficiency programs (see DP9 above)

DP10 In the past five years, have you participated in any energy efficiency or energy saving programs offered by NYSERDA or your utility company?

- 1 Yes [Which ones?]
- 2 No [Why not?]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

DP10_1_oth Which energy efficiency/saving programs did you participate in? (See DP10 above)

***DP10_1a** Which energy efficiency/saving programs did you participate in? [CATEGORIZED]

For DP10_1a_1 through DP10_1a_13

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

- *DP10_1a_1** HVAC
- *DP10_1a_2** Appliances
- *DP10_1a_3** Energy Audit
- *DP10_1a_4** Windows/Doors/Weatherization
- *DP10_1a_5** Lighting
- *DP10_1a_6** Water heating equipment
- *DP10_1a_7** Converting to natural gas
- *DP10_1a_8** Multifamily Performance program
- *DP10_1a_9** ENERGY STAR homes

*DP10_1a_12 Other [SPECIFY]

DP11 In the past, have you researched or looked for energy-related information?

1	Yes	
2	No	[SKIP TO DP12a]
-8	Don't know	[SKIP TO DP12a]
-9	Refused	[SKIP TO DP12a]

DP12_opn Which websites or publications do you typically go to for energy-related information?

[RECORD RESPONSE VERBATIM]

***DP12_1a** Which websites or publications do you typically go to for energy-related information?
[CATEGORIZED] (see DP12_opn above)

For DP12_1a_1 through DP12_1a_11

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

***DP12_1a_1** General web search

***DP12_1a_2** Utilities (NYSERDA, ConEd, LIPA, National Grid, Central Hudson, PSE&G)

***DP12_1a_3** LEED

***DP12_1a_4** Tradeshow

***DP12_1a_5** Consultants/Contractors

***DP12_1a_6** Word of mouth

***DP12_1a_7** Suppliers

***DP12_1a_8** National Fuel

***DP12_1a_9** New York State

***DP12_1a_10** New York City

***DP12_1a_11** Other [SPECIFY]

***DP12_1a_11_oth** Description of other websites or publications typically used for energy-related information? (see DP12_1a above)

DP12a_opn What sources do you use for real estate management and industry information?

[RECORD RESPONSE VERBATIM]

***DP12a_1a** What sources do you use for real estate management and industry information?
[CATEGORIZED] (see DP12a_opn above)

For DP12a_1a_1 through DP12a_1a_7

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

***DP12a_1a_1** Web search

***DP12a_1a_2** Real estate or trade publications/magazines/newspapers

***DP12a_1a_3** Real estate organizations/Trade associations/Management companies

***DP12a_1a_4** Government regulations

***DP12a_1a_5** Tradeshow

***DP12a_1a_6** Word of mouth

***DP12a_1a_7** None

DP13

Do you or your company have a policy that specifies energy efficient equipment should be purchased when purchasing new equipment, such as appliances, heating and cooling systems, and lighting for multifamily properties?

- | | | |
|----|------------|--------------|
| 1 | Yes | |
| 2 | No | [SKIP TO C1] |
| -8 | Don't know | [SKIP TO C1] |
| -9 | Refused | [SKIP TO C1] |

DP14_opn

What is the policy?

[PROBE FOR TYPES OF EQUIPMENT AND SPECIFICS ON EFFICIENCY LEVELS.]

[RECORD RESPONSE VERBATIM]

COMMON AREAS

C1 Next, I'd like to ask you about some common area amenities that you may or may not have at this multifamily property.

Are there any TVs in common areas on this property, such as in a clubhouse, exercise room, or rental office?

- | | | |
|----|------------|--------------|
| 1 | Yes | |
| 2 | No | [SKIP TO C4] |
| -8 | Don't know | [SKIP TO C4] |
| -9 | Refused | [SKIP TO C4] |

C2 How many of each of the following types of entertainment equipment are located in common areas? [READ LIST]

For C2a through C2k

- [0-75]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

- C2a** # of Standard tube TVs
- C2b** # of Flat screen Plasma TVs
- C2c** # of Flat screen LCD or LED TVs
- C2d** # of Projection TVs [NOT projectors]
- C2e** # of Cable, satellite, or set-top box
- C2f** # of DVR; for example, TiVo
- C2g** # of DVD or Blu-Ray player
- C2h** # of VCR
- C2i** # of Digital TV converter box
- C2j** # of Video gaming system [PS3, PlayStation, Nintendo, XBOX, Wii]
- C2k** # of Smart strips [a power strip with sensor to save electricity]

C4 Are there any fireplaces in common areas on this property?

- | | | |
|----|------------|--------------|
| 1 | Yes | |
| 2 | No | [SKIP TO C6] |
| -8 | Don't know | [SKIP TO C6] |
| -9 | Refused | [SKIP TO C6] |

C5 How many of each of the following types of fireplaces are located in common areas?
[READ LIST]

For C5a through C5c

- | | | |
|----|-----------------|--|
| — | [0-75] | |
| -6 | Programmed skip | |
| -8 | Don't know | |
| -9 | Refused | |

C5a # of wood fireplaces

C5b # of gas fireplaces [natural gas and/or propane]

C5c # of electric fireplaces

C6 Is there a common kitchen at this property?

- | | | |
|----|------------|--------------|
| 1 | Yes | |
| 2 | No | [SKIP TO C8] |
| -8 | Don't know | [SKIP TO C8] |
| -9 | Refused | [SKIP TO C8] |

C7 How many of each of the following types of kitchen appliances are located in common areas?

For C7a through C7c

- [0-75]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

C7a # of refrigerators

C7b # of microwaves

C7c # of stoves

C8 Is there an exercise room or gym at this property?

- 1 Yes
- 2 No [SKIP TO C10]
- 8 Don't know [SKIP TO C10]
- 9 Refused [SKIP TO C10]

C9 How many exercise machines that are run on electricity, such as treadmills and elliptical machines, are available for tenant's use?

—	# of machines	[0-75]
-6	Programmed skip	
-8	Don't know	
-9	Refused	

C10 Do you have a swimming pool with a filtering system for your residents' use?

1	Yes	
2	No	[SKIP TO C16]
-8	Don't know	[SKIP TO C16]
-9	Refused	[SKIP TO C16]

C11 Does the pool have a pool pump?

1	Yes	
2	No	[SKIP TO C13]
-6	Programmed skip	
-8	Don't know	[SKIP TO C13]
-9	Refused	[SKIP TO C13]

C12 Is the pool pump a high efficiency pool pump?

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

C13 Does the pool have an automatic timer that controls the time of day that the pool pump operates?

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

C14 Does the pool have a heater?

- | | | |
|----|-----------------|---------------|
| 1 | Yes | |
| 2 | No | [SKIP TO C16] |
| -6 | Programmed skip | |
| -8 | Don't know | [SKIP TO C16] |
| -9 | Refused | [SKIP TO C16] |

C15 What type of fuel does the pool heater use? [PROBE WITH CATEGORIES AS NEEDED]

- | | |
|----|------------------------------------|
| 1 | Electricity |
| 2 | Natural gas from underground pipes |
| 3 | Propane (bottled gas) |
| 4 | Solar |
| 5 | Some other fuel [SPECIFY] |
| -6 | Programmed skip |
| -8 | Don't know |
| -9 | Refused |

C15_5_oth Description of other type of fuel used by pool heater (see C15 above)

C16 Is there a hot tub, spa, or Jacuzzi for your residents' use?

- | | | |
|----|------------|---------------|
| 1 | Yes | |
| 2 | No | [SKIP TO CW1] |
| -8 | Don't know | [SKIP TO CW1] |
| -9 | Refused | [SKIP TO CW1] |

C17 What type of fuel is used to heat the water in your hot tub, spa, or Jacuzzi?
[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas from underground pipes
- 3 Propane (bottled gas)
- 4 Solar
- 5 Some other fuel [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

C17_5_oth Description of other type of fuel to heat hot tub, spa, or Jacuzzi (see C17 above)

CLOTHES WASHING AND DRYING

CW1 Does the property have a common area laundry?

- 1 Yes
- 2 No [SKIP TO M1]
- 8 Don't know [SKIP TO M1]
- 9 Refused [SKIP TO M1]

CW2 How many clothes washers are in the common area laundry?

- ___ # of clothes washers [0-75] [IF ZERO SKIP TO CW6]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

CW3 Are the majority of clothes washer[s] one that you load from the top or from the front?

- 1 Top loading
- 2 Front loading
- 6 Programmed skip
- 8 Don't know
- 9 Refused

CW4 About how old are the majority of clothes washers?

[PROBE WITH CATEGORIES AS NEEDED]

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

CW5 [ASK IF E1=2 OR E1=3 AND CW4 = 1, 2, OR 3] Are the majority of the clothes washer[s] ENERGY STAR rated? [PROBE: DID IT HAVE THE ENERGY STAR LOGO ON IT?]

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

CW6 How many clothes dryers are in the common area laundry room?

- ___ # of clothes dryers [0-75] [IF ZERO SKIP TO CW9]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

CW6a [SKIP IF CW2 OR CW6 <> 0] [Respondent answered that they have zero washers and zero dryers in their laundry area.]

[PRESS 1 TO SKIP BACK TO CHANGE CW1 TO NOT 'YES']

CW7 What type of fuel do the majority of clothes dryers use?

[PROBE WITH CATEGORIES AS NEEDED]

- 1 Electricity
- 2 Natural gas [from underground pipes]
- 3 Propane (bottled gas)
- 4 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

CW7_4_oth Description of other type of fuel used by clothes dryers (see CW7 above)

CW8 About how old are the majority of clothes dryers?

[PROBE WITH CATEGORIES AS NEEDED]

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

CW9 Do you own or lease the clothes [IF CW2<>0: washers] and [IF CW6<>0: dryers]?

- 1 Own all
- 2 Lease all
- 3 Own some and lease some
- 6 Programmed skip
- 8 Don't know
- 9 Refused

CW10 Does the tenant pay for laundry, or is it included in rent?

- 1 Tenant pays for laundry
- 2 Laundry is included in rent
- 3 Other [SPECIFY]
- 6 Programmed skip
- 8 Don't know
- 9 Refused

CW10_3_oth Description of other type of laundry payment setup (see CW10 above)

MISCELLANEOUS

M1 Do you use a generator, including natural gas, solar, or wind, to supply your electric needs?

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

M2

Does your property have solar panels, including PV or active solar for hot water or space heating?

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

M3 How many of each of the following types of computer and office equipment are available for tenant use or in the business office? [READ LIST]

For M3a through M3k

- ___ [0-75]
- 8 Don't know
- 9 Refused

M3a Desktop computer

M3b Laptop computer

M3c iPads, tablet computers

M3d CRT computer monitors

M3e LED or LCD flat screen computer monitors

M3f Combination printer/copier/scanner/fax machine

M3g Individual printer

M3h Individual copier

M3i Individual fax machine

M3j Individual scanner

M3k Any other type of computer or home office equipment? [SPECIFY]

M3k_a_opn Description of any other type of computer or home office equipment (see M3k above)

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

M4a_1 [ASK IF S6≠1 and S17≠11, 12, OR 13 [not new construction]] NYSEDA is offering select multifamily building developers and owners in your area a \$150 gift card to allow a trained technician to visit their property to gather more detailed information about the property's energy usage in common areas, which is around a 3 hour effort. As part of this visit the technician will need to review the property's energy bills and will look at the building's heating, cooling, and water heating equipment; lighting; and weatherization. The technician would also like to look at about 5 tenant units to better understand the type of energy using equipment in these units. Since this will increase the time we need to spend at your property, in addition to your \$150 gift card, we would provide additional \$40 gift cards per tenant unit visited.

If you are willing to allow us to visit your property, we will contact you again in the next week to set up an appointment. We want to emphasize, during the visit there will be no attempt to sell you anything. The information gathered will be used to evaluate and improve energy efficiency programs offered by NYSERDA and your utility.

- 1 Continue
- 6 Programmed skip

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

M4a_2 [[ASK IF S6≠1 and S17≠11 and S17≠12] Would you be willing to allow a trained technician to visit your site?

- 1 Yes
- 2 Possibly, but I need more information
- 3 No
- 6 Programmed skip

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

M4b_1 [ASK IF S6=1 or S17=11 or S17=12 [is new construction]] NYSERDA is offering select multifamily building developers and owners in your area a \$300 gift card to allow a trained technician to visit their property to gather more detailed information about the property's energy usage in common areas. As part of this visit, the technician will need to review the property's energy bills and will look at the building's heating, cooling, and water heating equipment; lighting; and weatherization. In addition to gathering data on the property's common areas, a small sample of tenant units may also be needed. This visit could take up to four, or more hours depending upon the size of the property.

If you are willing to allow us to visit your property, we will contact you again in the next week to set up an appointment. We want to emphasize, during the visit there will be no attempt to sell you anything. The information gathered will be used to evaluate and improve energy efficiency programs offered by NYSERDA and your utility.

- 1 Continue
- 6 Programmed skip

[Note: Text changed on 2/10/14 to help respondent better understand the onsite visits.]

M4b_2

[ASK IF S6=1 or S17=11 or S17=12] Would you allow a trained technician to visit your site?

- 1 Yes
- 2 Possibly, but I need more information
- 3 No
- 6 Programmed skip

M5a

[ASK IF M4a_2=1 or 2 or M4b_2=1 or 2] Is the following the most accurate information for [COMPLEX_NAME]?

M5a_opn
M5c_opn
M5d_opn
M5e_opn

	Information on file	Copied / New Information
Complex name	[COMPLEX_NAME]	
Address	[RENTADDR]	
City	[RENTCITY]	
Zip code	[RENTZIPC]	

M5b

[ASK IF M4a_2=1 or 2 or M4b_2=1 or 2] Who should we contact to schedule a visit at [COMPLEX_NAME]?

M5b_opn
M5f_opn
M5g_opn
M5h_opn

	Information on file	Copied / New Information
Contact name	[CONTACT NAME]	
Office phone	[PHONE]	
Cell phone		
Email		

[Note: New text about site visit contact added on 02/10/2014.]

M6 Thank you, again, for your help with this important study. [IF M4a_2 OR M4b_2 = 1 OR 2:
Also thank you for your willingness to participate in a site visit. Someone will be contacting
you within the next week to schedule the appointment.

Do you have any comments that you would like to share?


- 1 Record comments [SPECIFY]
- 2 No comments

M7 [DO NOT READ] [INTERVIEWER: RECORD GENDER]

- 1 Male
- 2 Female

Appendix B: Sample Letters for All Data Collection Activities

Figure 6. Data Release Authorization Form



Data Release Authorization Form
NYSERDA Statewide Residential Baseline Study

This form authorizes New York State Energy Research and Development Authority (NYSERDA) and/or its designated representatives to obtain certain utility billing and consumption data, described below, from the identified energy suppliers for use in indentifying the performance of the property's energy systems.

Property Name _____

Property Address _____ City _____ State _____ Zip Code _____

Contact Name _____ Contact Phone _____

Contact E-mail _____

Electricity	(Please Print Clearly)
Utility Provider:	
Electric Account #:	

Natural Gas	(Please Print Clearly)
Natural Gas Utility Provider:	
Natural Gas Account #:	

Other/Delivered Fuel	(Please Print Clearly)
Fuel Type & Provider:	
Fuel Account #:	

As an authorized representative of the property listed above, I hereby authorize the identified energy suppliers to release, to NYSERDA and/or its designated representatives, utility billing and consumption data for the property listed above for the past 60 months. I understand that NYSERDA will use this data to conduct the Statewide Residential Baseline Study to better understand energy patterns and potential energy savings for all New York residential buildings. I further understand that the data will be used only for evaluation purposes, that results will be reported only in the aggregate, and that the data obtained pursuant to the agreement will be treated as confidential to the extent permitted by law.


Signature of Authorized Representative _____ Date _____

Title _____

New York State Energy Research and Development Authority

Albany 17 Columbia Circle, Albany, NY 12203-8399 (P) 1-866-NYSERDA (F) 518-862-1091 nyserda.ny.gov info@nyserda.ny.gov Richard L. Kauffman, Chairman John B. Rhodes, President and CEO	Buffalo 726 Exchange Street Suite 821 Buffalo, NY 14210-1484 (P) 716-842-1522 (F) 716-842-0156	New York City 485 Seventh Avenue Suite 1006 New York, NY 10018-6815 (P) 212-971-5342 (F) 518-862-1091	West Valley Site Management Program 9030-B Route 219 West Valley, NY 14171-9500 (P) 716-942-9880 (F) 716-942-9961
--	---	--	---

Figure 7. Single Family and Tenant Survey Postal Mail Invite



DATE

RECIPIENT
MAILING ADDRESS
MAILING CITY, MAILING STATE MAILING ZIP

CASE ID

Dear CONTACT NAME,

Recently, we sent you a letter inviting you to participate in a study to determine ways to help New York consumers save energy and reduce costs. Your household has been randomly selected to participate in this statewide study to gather information on home energy use in newly constructed homes. Whether you occupy the home as a renter or owner, or have many or few appliances, your feedback is equally important. **We are offering an incentive valued at \$20 to those who complete the survey on-line or by telephone as a token of our appreciation.**

If you have already completed the survey online or via telephone, ***thank you***. If you have not yet done so, please log-on to energystudy.nyserda.ny.gov before <INSERT DATE> and use the ID number <INSERT CASE ID> to enter and complete the survey. The participation in this study is limited and the survey will close once the quota for your region has been met.

To complete the study by phone please call 1-800-454-5070 to speak with an interviewer from Tetra Tech, an independent research firm hired by NYSERDA, who will ask you about your household's energy-using equipment and other factors that affect your energy use.

Upon completion of this survey, your household may be selected to receive an additional incentive. With your permission, a trained and certified engineer will complete a visit to your home to collect additional information on your energy consumption and equipment.

Should you have any questions about this study, please feel free to call NYSERDA customer service at 1-877-NYSMART (1-877-697-6278), email at info@nyserda.ny.gov, or refer to the frequently asked questions at nyserda.ny.gov/energystudyinfo. Thank you in advance for your cooperation with this important study.

Sincerely,


Carley Murray, Associate Project Manager, Evaluation

Si prefiere completar la encuesta en español, por favor llame a 1-800-454-5070 y deje su nombre, número telefónico, y la mejor hora para llamarle.

New York State Energy Research and Development Authority

Albany 17 Columbia Circle, Albany, NY 12203-6399 (P) 1-866-NYSERDA (F) 518-862-1091 nyserda.ny.gov info@nyserda.ny.gov Richard L. Kauffman, Chair John B. Rhodes, President and CEO	Buffalo 726 Exchange Street Suite 821 Buffalo, NY 14210-1484 (P) 716-842-1522 (F) 716-842-0156	New York City 1359 Broadway 19 th Floor New York, NY 10018-7842 (P) 212-971-5342 (F) 518-862-1091	West Valley Site Management Program 9030-B Route 219 West Valley, NY 14171-9500 (P) 716-942-9960 (F) 716-942-9961
--	---	---	---

Figure 8. Single Family and Tenant Survey Postal Mail Invite



DATE

RECIPIENT
MAILING ADDRESS
MAILING CITY, MAILING STATE MAILING ZIP

CASE ID

Dear CONTACT NAME,

Recently, we sent you a letter inviting you to participate in a study to determine ways to help New York consumers save energy and reduce costs. Whether you occupy the home as a renter or owner, or have many or few appliances, your feedback is equally important. **We are offering an incentive valued at \$20 to those who complete the survey on-line or by telephone as a token of our appreciation.**

If you have already completed the survey online or via telephone, *thank you*. If you have not yet done so, please log-on to the link below and use the **<INSERT CASE ID>** to complete the study or call 1-800-454-5070 to complete the survey over the phone.

To access the survey on-line visit the following site: <https://energystudy.nyserda.ny.gov> using the ID: **<INSERT CASE ID>**.

If you are unable to complete the survey on-line, an interviewer from Tetra Tech, an independent research firm hired by NYSERDA, will be contacting you in the next couple weeks to ask about your household's energy-using equipment and other factors that affect your energy use.

Upon completion of this survey, your household may be selected to receive an additional incentive. With your permission, a trained and certified engineer will complete a visit to your home to collect additional information on your energy consumption and equipment.

Should you have any questions about this study, please feel free to call NYSERDA customer service at 1-877-NYSMART (1-877-697-6278), email at info@nyserda.ny.gov, or refer to the frequently asked questions at nyserda.ny.gov/energystudyinfo. Thank you in advance for your cooperation with this important study.

Sincerely,

Carley Murray, Associate Project Manager, Evaluation

Si prefiere completar la encuesta en español, por favor llame a 1-800-454-5070 y deje su nombre, número telefónico, y la mejor hora para llamarle.

New York State Energy Research and Development Authority

Albany
17 Columbia Circle, Albany, NY 12203-6399
(P) 1-866-NYSERDA | (F) 518-862-1091
nyserda.ny.gov | info@nyserda.ny.gov
Richard L. Kauffman, Chair
John B. Rhodes, President and CEO

Buffalo
726 Exchange Street
Suite 821
Buffalo, NY
14210-1484
(P) 716-842-1522
(F) 716-842-0156

New York City
1359 Broadway
19th Floor
New York, NY
10018-7842
(P) 212-971-5342
(F) 518-862-1091

**West Valley Site
Management Program**
9030-B Route 219
West Valley, NY
14171-9500
(P) 716-942-9960
(F) 716-942-9961

Figure 9. Single Family On-site Inspection Recruitment Postal Mail Letter



DATE

RECIPIENT

MAILING ADDRESS

MAILING CITY, MAILING STATE MAILING ZIP

CASE ID

Dear CONTACT NAME,

The New York State Energy Research and Development Authority (NYSERDA) is conducting a statewide residential study to determine ways to help New York consumers save energy and reduce costs. We are currently scheduling on-site surveys of newly constructed, 2012 or later, single family homes located on Long Island. Single family homes for this study include both free standing homes as well as attached homes with no more than one to four family units in the building. Whether you occupy the home as a renter or owner, or are the builder for this home, you may qualify for the study. **As a thank you, for participating in this study, you will receive a \$100 incentive.** To participate, please contact us with the next two weeks to ensure your eligibility in this study.

With your permission, a trained and certified Home Energy Rater will complete an energy rating of your home during the visit. They will review your insulation levels, heating and cooling equipment, appliances and conduct two diagnostic tests in order to learn more about how your home uses energy.

Please contact Lauren McFeeley to ensure participation in the study, at Performance Systems Development, at (607) 277-6240 extension 282. You may also reach her by cell phone at (607) 220-8138 or by email at lmcfeeley@psdconsulting.com.

Please be assured that the information collected on your home will be kept confidential to the extent permitted by law. NYSEDA's analysis will not identify individual respondents or homes. Should you have any questions about this study, please feel free to call NYSEDA customer service at 1-877-NYSMART (1-877-697-6278), email at info@nyserdanv.gov, or refer to the frequently asked questions at www.nyserdanv.gov/energystudyinfo.

Thank you in advance for your cooperation with this important study.

Sincerely,

Carley Murray, Associate Project Manager, Evaluation

Si prefiere completar la encuesta en español, por favor llame a 1-800-454-5070 y deje su nombre, número telefónico, y la mejor hora para llamarle.

New York State Energy Research and Development Authority

Albany
17 Columbia Circle, Albany, NY 12203-6399
(P) 1-866-NYSERDA | (F) 518-862-1091
nyserdanv.gov | info@nyserdanv.gov
Richard L. Kauffman, Chair
John B. Rhodes, President and CEO

Buffalo
726 Exchange Street
Suite 821
Buffalo, NY
14210-1484
(P) 716-842-1522
(F) 716-842-0156

New York City
1359 Broadway
19th Floor
New York, NY
10018-7842
(P) 212-971-5342
(F) 518-862-1091

**West Valley Site
Management Program**
9030-B Route 219
West Valley, NY
14171-9500
(P) 716-942-9960
(F) 716-942-9961

Figure 10. HVAC Email to Contractors

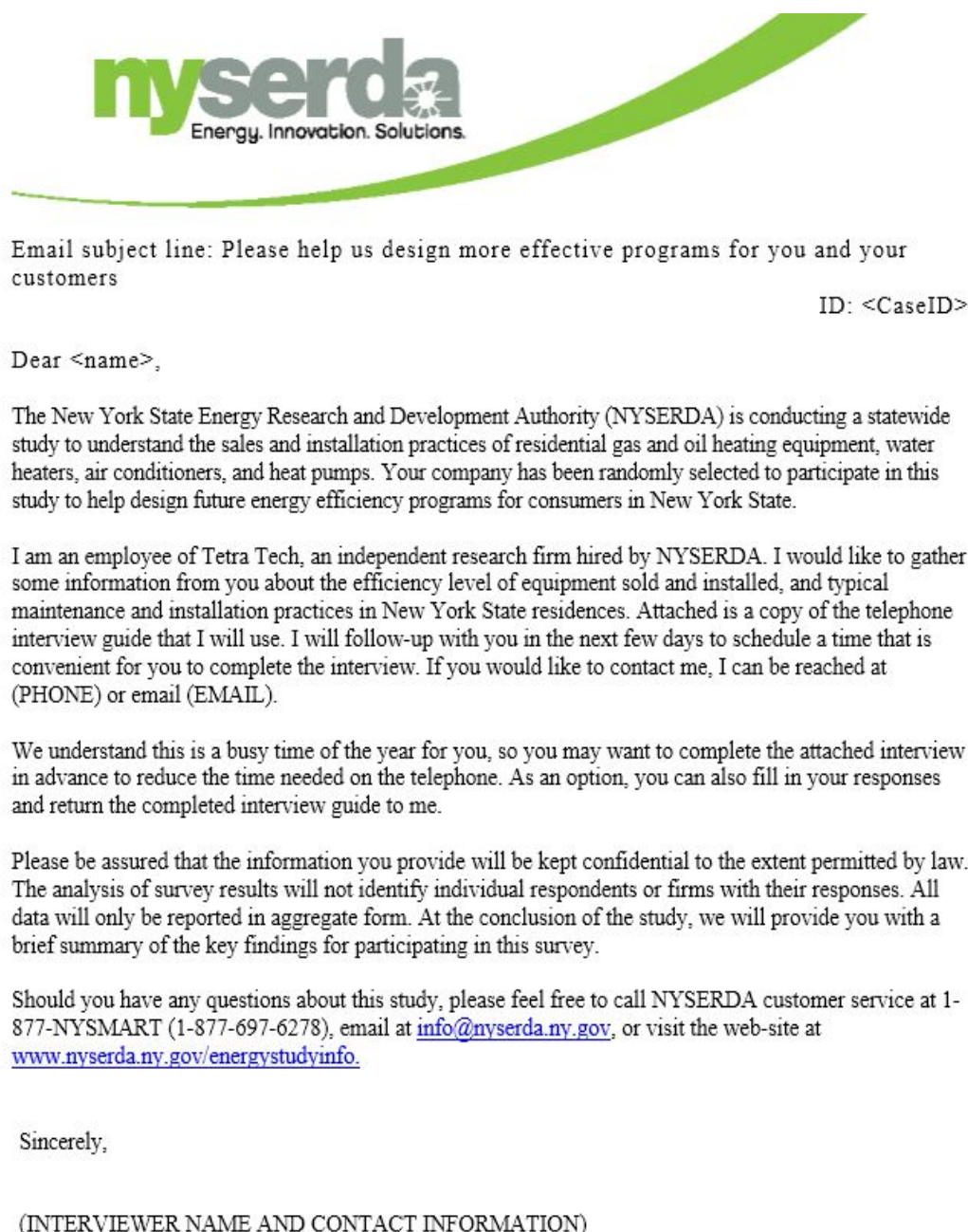


Figure 11. HVAC Table of Equipment to Contractors



New York State Energy Research and Development Authority
HVAC Market Assessment Survey: Table of Equipment Types and Efficiency Categories

RESIDENTIAL CENTRAL AIR CONDITIONERS AND AIR SOURCE HEAT PUMPS					
Equipment Type	TOTAL UNITS SOLD IN 2013	NOT HIGH EFFICIENCY	QUALIFY FOR TIER 1	QUALIFY FOR TIER 2	QUALIFY FOR TIER 3
Central Air Conditioners—Split Systems	#	# Less than 14.5 SEER or Less than 12 EER	# 14.5 SEER but less than 15 SEER or 12 EER but less than 12.5 EER	# 15 SEER but less than 16 SEER or 12.5 EER but less than 13 EER	# 16 SEER and Above or 13 EER and Above
Central Air Conditioners--Packaged	#	# Less than 14 SEER or Less than 11 SEER	# Greater than 14 SEER but less than 14 or Greater than 11 EER but less than 12	# 14 SEER and above or 12 EER and above	NA
Heat Pumps—Split Systems	#	# Less than 14.5 SEER or Less than 12 EER or Less than 8.2 HSPF	# 14.5 SEER to less than 15 SEER or 12 EER to less than 12.5 EER or 8.2 HSPF to less than 8.5 HSPF	# 15 SEER or 12.5 EER or 8.5 HSPF	NA
Heat Pumps—Packaged Systems	#	# Less than 14 SEER or less than 11 EER or less than 8.0 HSPF	# 14 SEER or 11 EER or 8 HSPF	# 14+ SEER or 12+ EER or 8+ HSPF	NA
Ductless Mini-Split Heat Pumps	#	# Less than 14 SEER or less than 11 EER or less than 8.0 HSPF	# 14 SEER 11 EER 8 HSPF	# 14+ SEER 12+ EER 8+ HSPF	NA

NYSERDA
1-877-NYSMART (1-877-697-6278) or
email info@nyserda.ny.gov
17 Columbia Circle
Albany, New York 12203

Tetra Tech
1-800-454-5070 or email at
dan.poquette@tetratech.com
6410 Enterprise Lane, Suite 300
Madison, WI 53719

Figure 12. HVAC Table of Equipment to Contractors (Continued)



New York State Energy Research and Development Authority
HVAC Market Assessment Survey: Table of Equipment Types and Efficiency Categories

RESIDENTIAL GAS AND OIL-FIRED FURNACES

Equipment Type	TOTAL UNITS SOLD IN 2013	NOT HIGH EFFICIENCY	QUALIFY FOR TIER 1	QUALIFY FOR TIER 2	QUALIFY FOR TIER 3
Residential Gas Furnaces (<225,000 Btu/h)	#	# Less than 90% AFUE	# Greater than 90% AFUE but less than 92%	# Greater than 92% AFUE but less than 94%	# 94% AFUE and above
Residential Oil-fired Furnaces (<225,000 Btu/h)	#	# Less than 85% AFUE	# 85% AFUE and above	NA	NA

RESIDENTIAL BOILERS

Equipment Type	TOTAL UNITS SOLD IN 2013	NOT HIGH EFFICIENCY	QUALIFY FOR TIER 1	QUALIFY FOR TIER 2
Residential Gas Boilers (<300,000 Btu/h)	#	# Less than 85% AFUE	# Greater than 85% AFUE but less than 90% AFUE	# 90% AFUE and Above
Residential Oil Boilers (<225,000 Btu/h)	#	# Less than 85% AFUE	# 85% AFUE and above	NA

RESIDENTIAL WATER HEATERS

Equipment Type	TOTAL UNITS SOLD IN 2013	NOT HIGH EFFICIENCY	QUALIFY FOR TIER 1	QUALIFY FOR TIER 2
Residential Gas Water Heaters--Storage	#	# Less than .67 EF	# Greater than .67 EF but less than .80 EF	# .80 EF and above
Residential Oil Water Heaters--Storage	#	# Less than .59 EF	# .59 EF and above	NA
Residential Gas Water Heaters-Tankless (Instantaneous)	#	# Less than .82 EF	# .82 EF and above	NA
Residential Gas Water Heaters--Condensing	#	# less than .80 EF	# .80 EF and above	NA

NYSERDA
 1-877-NYSMART (1-877-697-6278) or
 email info@nyserdan.y.gov
 17 Columbia Circle
 Albany, New York 12203

Tetra Tech
 1-800-454-5070 or email at
 dan.poquette@tetratech.com
 6410 Enterprise Lane, Suite 300
 Madison, WI 53719

Appendix C: Screen Shots of the On-site Data Collection Tool*



NYSERDA Baseline Study — List of Inspections

11/19/2013	9:00 AM	2603 Caldwell Road	Belmont	14813
Case ID: Demo046	Type: Existing Multi-Family	Status: New	Inspector: sfauditor	
11/20/2013	12:00 PM	1108 Bicetown Road	Mineola	11501
Case ID: Demo084	Type: Existing Single Family	Status: Submitted	Inspector: sfauditor	
11/20/2013	1:00 PM	3315 Small Street	New York	10004
Case ID: Demo027	Type: Existing Single Family	Status: Submitted	Inspector: sfauditor	
11/21/2013	10:00 AM	2028 James Street	Wellsville	14895
Case ID: Demo094	Type: Existing Single Family	Status: Submitted	Inspector: sfauditor	
11/25/2013	10:00 AM	1817 Geraldine Lane	New York	10011
Case ID: Demo065	Type: Existing Single Family	Status: New	Inspector: sfauditor	

Go to Tools | Hide Samples | Hide Submitted | Show All | Download Active Inspections

* The On-site Data Collection Tool demonstration is not populated using the actual data from the study sample.

iPad

2:04 PM

38%

MobilePSD_NYBaseline

3315 Small Street, New York

Envelope

Foundation

Slab

Floors

Rim/Band

Walls

Ceiling

Windows

Doors

IR/Notes

Year built

1936

Home Type

Single Family Detached

Number of occupants

5

Number of bedrooms

8

Stories above grade

11

Avg. ceiling height (ft)

14

Cond. floor area (ft^2)

2400

Area Calculator

Architectural Style

Roof Material

Shingles

Roof Color

Dark

Roof Condition

Poor

Siding Material

Vinyl

Siding Color

Dark

Siding Condition

Good

Exterior Window Shading

Half of Windows Shaded

Wind Shielding of Home

Normal

Basement Type

Slab on Grade (none)

Significant Structural Features:

Cape Style Knee Walls

Split Level

Balloon Frame

Post and Beam

Additions

Room over Garage

Vertical Chases

Cantilevers

Garage type

None

Garage interior finish

NA

Connectivity of Boundary Wall

N/A- Not Attached

Connectivity of Ceiling

N/A- Not Attached

Connectivity of Duct

N/A- Not Attached

Attached garages

iPad

2:13 PM

36%

MobilePSD_NYBaseline

3315 Small Street, New York

1 Clothes Washer - Count: 1 Type: Top Loading Make: Famous Brand

2 Refrigerator - Count: 1 Make: Famous Brand Cu Ft: 19 Style: Top

3 TV - Count: 1 Size: 36 Type: LED

4 Dishwasher - Count: 1 Efficiency: .49

to delete click

New

Appliance Completeness Checks

Refrigerator

Count

1

Manufacturer

Famous Brand

Model

123456-abc

Year Of Manufacture

2004

Known

Size (ft^3)

19

TypeOrStyle

Top Freezer

Water/Ice Dispenser

No

EnergyStar

Yes

Energy Guide Annual Use (\$)

510

Location

Conditioned

Name Plate Photo

Appliance Notes:

NYSERDA, a public benefit corporation, offers objective information and analysis, innovative programs, technical expertise, and support to help New Yorkers increase energy efficiency, save money, use renewable energy, and reduce reliance on fossil fuels. NYSERDA professionals work to protect the environment and create clean-energy jobs. NYSERDA has been developing partnerships to advance innovative energy solutions in New York State since 1975.

To learn more about NYSERDA's programs and funding opportunities, visit nyserda.ny.gov or follow us on Twitter, Facebook, YouTube, or Instagram.

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

17 Columbia Circle
Albany, NY 12203-6399

toll free: 866-NYSERDA
local: 518-862-1090
fax: 518-862-1091

info@nyserda.ny.gov
nyserda.ny.gov



NYSERDA

State of New York

Andrew M. Cuomo, Governor

New York State Energy Research and Development Authority

Richard L. Kauffman, Chair | John B. Rhodes, President and CEO

